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ABSTRACTS

Salim Tamari and Anne Scott. Fertility of
Palestinian Women between National Perspective
and Social Reality

This paper investigates the social content of fertility patterns in four Palestinian conglomerations, viz., the West Bank, Gaza Strip, Galilee and Jerusalem, on the basis of an analysis of fertility data derived from official sources and field work conducted by Palestinian demographers. It seeks to identify meaningful relationships between these data and variables related to the household's place of residence, social class, and vocational and educational background. The paper also reviews the demographic history of Arab citizens in the occupied territories since 1948 to determine the effect on fertility trends in the 1950s, 1960s and 1970s by such factors as confiscation of land, shifting to work in industrial production and migration to cities. In addition, the paper discusses weak and strong points in a comparison between demographic patterns in Galilee and other Palestinian territories.

The paper finally touches on the impact of the Palestinian intifada, according to the limited statistical data available on fertility trends in the short term including increasing cases of marriage and early marriage.

Mustafa Al-Shalkani. A System for Collecting Vital
Statistics in Gulf Cooperation Council
Countries

This paper examines the four major sources of population data in the countries of the Arab Gulf Cooperation Council (GCC) viz., general population censuses, registration statistics, household surveys and permanent registration of population.

The paper starts with an analysis of the status quo of these sources in each country of the GCC, then proceeds to examine their standards of accuracy and finally identifies the problems faced by the

data collection process in each source separately and states some practical solutions to them.

In order to formulate a balanced policy for population data collection, the paper proposes an overall strategy on the four sources of population data with an attempt to design a social demographic database depending on these sources and serving as a foundation for various population data.

Abbas F. Al-Sa'adi. Spatial Diffusion of the Population of Al-Jazirah Region in Iraq

This paper attempts to explain spatial diffusion of the population in Al-Jazirah area, which lies in the northwest of Iraq between the Tigris, Euphrates and the Syrian-Iraqi border.

To draw a picture of this diffusion, the geographical distribution of the population of the area was studied on the basis of data for 1977 as compared with those for 1987 to determine the extent of change that took place in population diffusion during the intervening period between the two censuses.

The study assumes that population diffusion and disparity from one locality to another in the Al-Jazirah area is associated with disparities in natural and human factors.

To determine the impact of these factors the stepwise regression method was employed. It appeared that rising above sealevel accounted for 32 per cent of the interpretation given to the discrepancy in population distribution. After pursuing the degree of contribution of other variables, it was found that 98 per cent of the discrepancy in diffusion can be forecast from determination of all the variables, except one which was excluded on account of its ineffectiveness.

Robert E. Looney. Structural Change in the Arabian Gulf: Impact of the Foreign Workforce

This paper aims to throw light on issues related to the actual economic impact of the non-national labour force by exploring areas in which

such labour force contributes to diversification of the labour-receiving country and how non-national workers differ from their national counterparts in effecting structural changes in the Arab Gulf region.

After considering patterns of migration to Arab Gulf countries and patterns of structural change in the economies of Gulf and other countries in the Arab world, the study embarks on an analysis of factors of sectoral patterns of production in member States of the Arab Monetary Fund for 1975 and 1985 for the purpose of appraising the roles played by national and non-national labour forces in the structural changes.

Finally, the study winds up with a review of certain results pertaining to effects exercised by the labour force, concluding that participation by the non-national labour force has been varying in the structural change of oil countries, that this change which had previously been influenced by developments in the construction sector has in recent years focused on the services sector, which is witnessing a noticeable expansion in management by nationals, and the industrial sector, which entirely relies on non-national labour.

**FERTILITY OF PALESTINIAN WOMEN
BETWEEN NATIONAL PERSPECTIVE
AND SOCIAL REALITY**

Salim Tamari
Anne Scott

Introduction

The present study aims to consider the so-called demographic problem, namely the fertility of Palestinian women within its social context, and considers the following issues: (1) a review of some demographic trends currently prevailing in Palestine and interpretation of their relationship with the fertility models in two decades of Israeli occupation (1967-1987); (2) the relationship between female fertility rates with their structural and ideological effects; (3) the relationship between the official policy, i.e., the national ideological position, and childbearing. The study also very briefly reviews the impact on fertility and the size of the Palestinian family of the Intifada since the beginning of 1988, in accordance with partial and limited statistical data. The scope of the study covers the population of four areas: the West Bank, Gaza, Arabs in Israel (1948 Palestinians) and the Arab sector of Jerusalem (Al-Quds). The demographic significance of Al-Quds should be stressed because of its inclusion in the detailed Israeli census of 1983 as well as the census organized by the military authorities in the West Bank and Gaza in 1967. This helps to deal with the social class variables affecting fertility, which are unavailable in the West Bank and Gaza. The importance of the demographic conditions in Galilee (1948 Arabs) lies in providing the historical dimension for the development of Arab fertility models as a result of urbanization, shift from the agricultural sector, State intervention in fertility through social security and childbearing incentives, etc. These variables are absent or are still in their early

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stage in the other Palestinian populations. The demographic issue in Palestine is linked to fertility, mortality and emigration trends. However, the scope of this study will be limited only to fertility trends and the social variables affecting them.

The Demographic Cause

Contrary to the situation prevailing in the majority of third-world countries, where population demographic trends are discussed with a reference framework related to balancing the economic and social aspirations of the State, the demographic cause has been at the forefront in the Arab-Israeli conflict and has been a more urgent factor in the last two decades. This is due to the important development in the aftermath of the June 1967 war, i.e., Israeli domination of the West Bank and Gaza. This means that nearly half the Arab labour force has been employed in the Israeli labour market, leading to the transformation of the Arab population from an ethnic group amounting to 16 per cent of the total population into about 40 per cent of the total population in 1990.

The demographic argument has been intensified recently because of the domination of the hawkish Zionist attitude towards the regional solution of the Palestinian cause since the Likud took over in 1977 and consolidation of the religious-nationalist alliance in the so-called "National Alliance" government. From the Israeli viewpoint, the demographic issue has been the potential threat in the natural growth rates of the Palestinian family, endangering, in the foreseeable future, the existence of a Jewish population majority, especially in the light of the decrease in Jewish immigration from Europe and the United States. From the Palestinian viewpoint, the demographic issue is the numerical challenge which will enable the Palestinian people in the next 20 years to confront and defeat the Zionist colonial expansion. (Khodor,

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1985; Friedlander and Goldscheider, 1979, pp.189-218).

This view is based on two assumptions unsupported by convincing evidence. The first assumption considers that the natural growth of the Arab population within the historical Palestinian borders will force Israel to extend the legal status of the Arab citizens (1948 Arabs) to the Palestinian population in the West Bank and Gaza. The second assumption is based on the belief that the demographic quantity will turn into a qualitative force contributing to a change of political balance in the Arab-Israeli conflict, hence the significance of the breaking of the magical 50 per cent barrier by the Arab population by the year 2005 in accordance with the expectations in Khodor's study (Khodor, 1958, p. 625).

It is worth noting that the advocates of "demographic struggle" are not necessarily advocates of either trend. To them, the issue is briefly how to face the displacement policy applied by Israel through economic means at present and through forced mass transfer in the future. (Kossaifi, 1985, pp. 108-114; Al-Rawi, 1985, pp. 21-50). The demographic solution here lies in "the tendency of fertility rates to remain high with mortality rates continuing to fall, which will necessarily lead to high rates of natural growth". As for migration, Chebib states that "if the rates of migration outside the Arab occupied territories fall, the coming years will witness considerable improvement in the demographic status of the Arab Palestinian population inside Palestine" (Chebib, 1985, p. 121).

Some interpret this demographic optimism into an effective language considering "the rise in fertility rates as a demographic weapon which can be used in resisting occupation and, therefore, promotion of high fertility plays a positive and important role in winning the struggle." They ask for "adopting two policies to support fertility:

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(a) supporting the health facilities in the occupied territories in order to provide free health services to citizens, especially to children, pregnant mothers and working women before and after childbirth, in addition to paying child and working mother allowances; (b) support and cohesion of family social organization, which helps maintain rising fertility rates in the occupied territories and strengthens the family and tribal position in the face of the occupation authorities, giving it more importance in the view of these authorities". (Samha, 1985, pp. 381-403).¹

Following is an attempt to coordinate these demographic assumptions through an analysis of data on fertility and mortality rates in the West Bank, Gaza and Galilee, and to assess the extent of their actual and potential relationship with the ideological professional positions which support fertility and family linkage.

The demographic apprehension is not limited to the Arab side. It was preceded by the Jewish national obsession with the difference in fertility among Arab and Jewish women during the Mandate period. Robert Bashi, the most famous Jewish demographer in that era, wrote an article published in Ha-Aretz in 1940 under the title "Decline of Jewish fertility: a national danger" (Friedlander and Goldscheider 1979, pp. 121-124 and p. 222). David Ben-Gurion was so concerned with this phenomenon that he established the Ben-Gurion Prize, a reward equivalent to about \$300 paid to every

¹ *Youssef Samha realized the possibility of a negative exploitation of tribalism and therefore he added that the "family and tribal power should be supported by appropriate means which should be accompanied by guiding the population to the desired aims to avoid exploitation in tribal disputes" (Samha, 1985, p. 403).*

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woman who gives birth to her tenth child.¹

The first prize was awarded in 1949, but it was abolished 10 years later when it was found out that many of those who received the prize were Arab women. Friedlander commented that "no one dared say in public that Arab women do not deserve this prize since the birth rate among Arab women exceeded 50 per thousand, and, consequently, they did not need incentives for fertility. This conclusion prevailed in the end, as it was found out that the prize, which was originally intended to increase fertility of Jewish families, was, in many cases, awarded to Arab women. For understandable reasons, Ben-Gurion later hinted that the Jewish Agency, a non-governmental organization, rather than the State, should supervise fertility promotion programmes" (op. cit., p. 126). What was not said in public in 1949 has now become a preoccupation of Israeli demographers. Palestinian and Arab demographers have adopted the same thesis of "demographic struggle" in reverse, becoming, after the occupation of the West Bank and Gaza in 1976, a major strategy in the confrontation with Israel. How has this argument been reflected in the demographic trends and fertility models of the Palestinian people since then?

Demographic Changes in Palestine

The main source of all demographic statistics in the West Bank and Gaza is the 1967 census intended by the Israeli authorities to determine the de facto population, while the de jure population was last included in the Jordanian 1961 census. Consequently, it is not possible to assess the credibility of the Israeli census by comparing it

¹ *It is ironical that the Family Promotion Society in Al-Beera decided, 30 years later, to award a similar prize to every Palestinian woman giving birth to her tenth child in occupied Palestine.*

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with the statistics of the Jordanian census because of the difference in the definition of the term "resident" on the one hand and as a result of the unrecorded migration in the intercensal period on the other hand. The same applies to the Gaza Strip, as the Egyptian Administration relied on the registration of the de jure population, but this registration was incomplete (Abu-Lughod, 1983, p. 16).

The present study uses the 1967 census as a starting-point for the analysis of demographic data. Despite the defects of this census, it has an important feature, namely that the concept of de facto population prevents the repeated registration of the Palestinians residing outside Palestine. It also uses recent field studies carried out by Palestinian researchers.

Fertility Models in the West Bank and Gaza in 1967-1987

Since 1967 the Israeli Central Bureau of Statistics has published total fertility statistics for the West Bank and Gaza, as well as among the Arab population in Israel (Figure I). These rates, derived from the official birth registration records, show clear harmony in the fertility trends in the West Bank and Gaza. A noticeable increase occurred in the years immediately following 1967, with a moderate decline from the mid-1970s to date.

The difficulty lies in interpreting what happened in the period 1968 to 1972, as relatively low rates were noted, followed by a considerable rise in the child-woman ratio in the above period.¹

¹ The terms "average number of births per woman" and "total fertility rate" used in the present study refer to abstract units used by demographers. For further details see: *The Demographic Directory* by Colin Newel, in which he indicates the total fertility rate, from which the birth rate per

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A comparison of this data with the credible estimates in Jordan for the period 1966 to 1971 indicating a birth rate of 8.5 per woman, and taking into account the fertility rates of Arabs in Israel as shown in Figure I lead to the conclusion that there were numerous cases of non-registration of births in the West Bank and Gaza Strip in the post-June 1967 war period. V. Schemelz offers another interpretation after examining the fertility rates for various age groups. He believes that the lack of balance between males and females at the marriage age in 1967, probably due to male migration, led to a sharp drop in birth rates among 15-24 year old females. In the following years "the normal patterns in marriage re-emerged through reunion of married couples separated during the war", (Schemelz and Kenvin, 1977, p.51) leading to increased Palestinian fertility.

As for Gaza Strip, the data of a study conducted by Anne Scott (1985), at Al-Shaja'ia district and Al-Shati' refugee camp show a rising marriage age after the June 1967 war, followed by a gradual decline not reaching the pre-war level.

The same phenomenon is reflected in the fertility of married young women in Gaza. One reason for such fluctuation in fertility rates could be male migration; another major reason could be regular omission of birth registration. This phenomenon has been acknowledged by the Israeli Central Bureau of Statistics, wherein the total fertility rate, as shown in Figure I, is 3 per cent higher than the estimates of Schemelz and Kenvin (1977, p. 50).

woman is derived. This term is defined as "the potential number of children a woman can give birth to provided that: (a) she has lived up to 50 and (b) has maintained in her reproductive life the fertility rate of the age group for the year in which the fertility rate was calculated".

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Although moderate, the decline in fertility rates since the mid-1970s constitutes a well-defined pattern. Total fertility between 1975 and 1984 dropped from 8 to 7 births per woman. This trend is reflected in the fertility rates by age groups. In the West Bank the fertility rate of 15-24 year old females has dropped constantly, while in Gaza the decline was limited to females below 20 years. It can be confirmed that the rising marriage age of females before the intifada caused a slight rise in the number of births in this age group. It is also noted that the fertility of females over 45 started to fall in the early 1970s. Despite the doubts in the accuracy of this trend, due to the cases of omission of birth registration, it is certain that registration cases have considerably improved in the past decade.

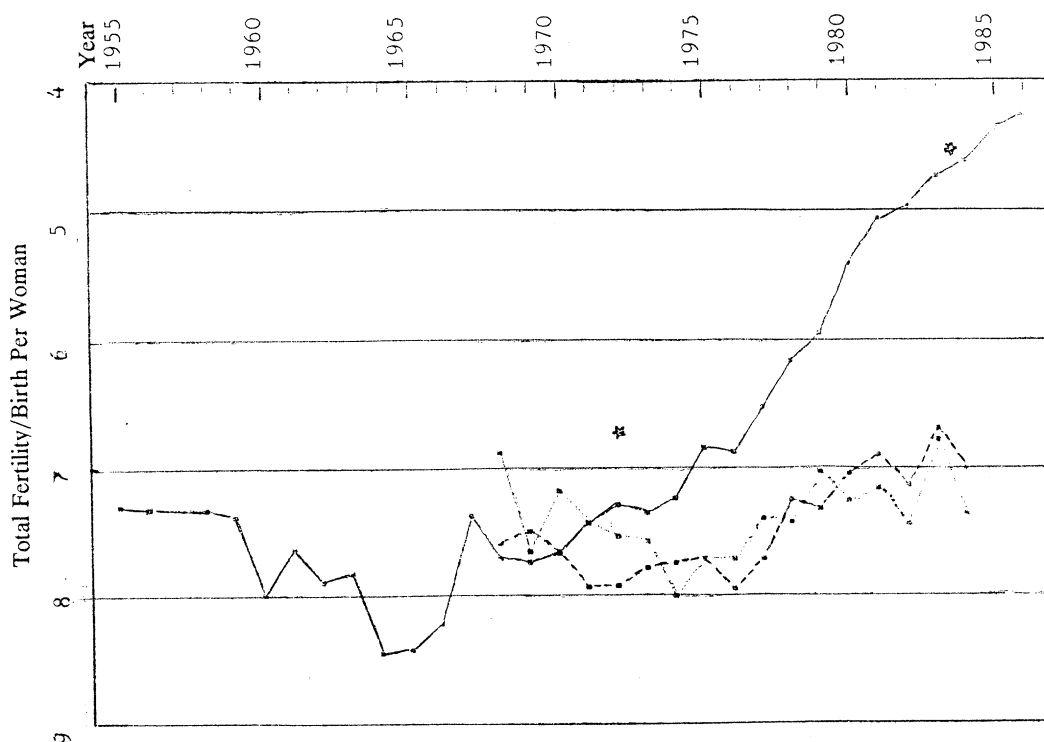
Failure to conduct a second census since the September 1967 census in the occupied territories makes it impossible to compare the fertility variables between various administrative units in the West Bank, apart from one study¹ published by the Central Bureau of Statistics based on samples of a field survey for the years 1973-1975 and which showed no difference in the rural fertility rates and fertility in the West Bank and Gaza Strip (Friedlander and Goldscheider, 1979, pp. 239-254). The study also indicates a slight decline in the fertility of women with more than nine years in the study (op. cit. p. 252).

However, the situation radically changed in the 1980s, as fertility rates dropped in comparison with rural fertility. While female fertility in three Palestinian villages was 8.7 births per woman in the

¹ In fact, there are also four field studies conducted by researchers from the West Bank and Gaza Strip. However, the scope of these studies is limited to local communities and they therefore cannot be used for purposes of regional comparison.

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FIGURE I. TOTAL FERTILITY RATIO IN WEST BANK, GAZA STRIP AND AL GALILEE, 1955-1985



Source: Calculated by author on the basis of statistical yearbooks published by the Israeli Central Bureau of Statistics.

Notes:

- ===== Al Galilee (1948 Arabs)
- West Bank
- Gaza Strip
- * Jerusalem

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early 1980s (Giacaman, 1988, p. 94), the rate prevailing in Al-Quds in 1983 was 4.9 births among Moslem women, which can be extended to cover urban centres in the West Bank (Schmelz, 1987).

Urban Fertility and Social Status in Al-Quds (Jerusalem)

The demographic importance of Al-Quds lies in its inclusion in the 1972 and the 1983 censuses as a result of the Israeli "legal" annexation, unlike the West Bank and Gaza Strip; the census provides detailed statistics on the relationship of social variables, such as occupation, years of education and area of residence, with fertility trends.

It should be pointed out that there are limits to comparison between the fertility figures in Al-Quds and those in the remaining occupied territories. The Israeli censuses in 1972 and 1983 covered de jure residents, i.e., those who had left the country for less than a year, while in the West Bank and Gaza, as well as population registration records there, the census was limited to de facto residents. Therefore, the tables involving comparison between Al-Quds and the West Bank and Gaza should be viewed cautiously due to their variation, although it is secondary variation in the present study and is therefore insignificant.

Fertility rates derived from the 1972 and 1983 censuses provide separate data for people of different religions and show that the total fertility rate for Moslem women fell from 7.5 births in 1972 to 4.9 births per woman in 1983.

The fertility rate among Christian women dropped from 2.8 to 1.8 births per woman during the

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Table 1. Birth ratio of married women and social characteristics

	Birth rate per woman 30-39 ^a	Engaged in academic, occupational and administrative sectors (percentage) ^b
First social group: low fertility		
Harat Al-Nasara	3.3	30.0
Sha'fat (West)	3.6	40.4
Sheikh Jarakh	3.6	30.7
Tariq Nablus	4.1	31.6
Bab Al-Sahira	4.2	27.6
Beit Hanina	4.5	27.8
Group rate	4.0	30.3
Second social group: medium fertility		
Wadi Hilwa	5.1	4.0
Al-Toor (North)	5.1	20.6
Sha'fat (East)	5.2	16.3
Wadi Al-Jawz	5.5	23.9
Ras Al-Amood	5.7	15.4
Harat Al-Moslimoon (a)	5.7	15.0
Jabal Al-Zaytoon (Al-Toor South)	5.7	13.2
Beit Safaga (South)	5.8	14.6
Beit Hanina (South)	5.9	17.0
Al-Thawri (East) Jabal Al Mukabbir	5.9	15.0
Group rate	5.6	16.2
Third social group: high fertility		
Harat Al-Muslimoon (b)	6.0	14.4
Salwan	6.4	7.2
Kafr Aqab	6.4	16.7
Harat Al-Muslimoon (c)	6.6	8.8
Um Laysoon	7.0	9.7
Al-Isawiya	7.1	5.3
Al-Sawahra	7.2	7.7
Sha'fat (Al-Mukhayam)	7.4	7.4
Sur Bahir	7.4	9.6
Group rate	6.8	9.8
Total/total rate	5.5	17.2

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OF HOUSEHOLD IN AL-QUDS (JERUSALEM)

Average years of education		Percentage of working women 15-60 ^b	Number	Population ^c %
Male	Female ^a			
11.1	8.5	19.1	4 322	3.7
10.6	9.5	23.5	2 862	2.5
12.2	9.8	18.0	1 891	1.6
10.7	9.6	18.7	1 232	1.1
12.2	10.1	14.0	4 479	3.9
10.9	9.4	15.5	7 005	6.0
11.3	9.4	17.3	21 791	18.8
8.7	6.3	5.9	2 884	2.5
9.6	8.8	11.8	6 418	5.5
10.4	8.6	9.0	5 698	4.9
10.6	8.9	24.8	4 687	4.0
8.4	7.0	7.1	6 105	5.3
9.5	6.9	12.6	6 908	6.0
8.7	7.1	6.0	5 132	4.4
10.1	8.9	13.3	2 849	2.5
10.5	8.8	8.2	4 630	4.0
8.9	6.7	5.6	8 237	7.1
9.5	7.8	10.3	53 548	46.2
8.4	7.8	14.3	4 227	8.6
8.9	6.3	4.2	5 082	4.4
10.7	7.4	6.4	4 212	3.6
8.5	6.7	6.3	5 971	5.2
7.5	5.5	1.0	2 519	2.2
8.6	6.2	6.2	3 550	3.1
8.1	0.9	2.4	3 559	3.1
6.8	6.0	3.9	5 916	5.1
9.2	6.7	6.7	5 485	4.7
8.6	6.2	6.1	40 521	35.0
9.6	7.6	10.5	115 860	100.0

Source: Author's calculations based on: Israel, Statistical Yearbook.

a Volume III 1984, pp. 10-15.

b Volume IV 1986, pp. 16-19.

c Volume II 1982, pp. 36-77.

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same period.¹

For purposes of comparison, the present study will consider the relationship of fertility in Al-Quds with the social, occupational and educational conditions of population in three residential areas: (a) quarters with low fertility parallel to the quarters of the upper and middle classes (Sheikh Jarrah, Sha'fat, Beit Hanina, etc.); (b) quarters with medium fertility parallel to working class quarters (Wadi Al-Jawz, Al-Thawri, Ras Al-Amood, Sha'fat Al-Sharqiya, Wadi Hilwa, etc.); and (c) quarters with high fertility parallel to rural and semi-rural areas, within the boundaries of Al-Quds municipality (Al-Issawiya, Kafr Aqab, Salwan, Arab Al-Sawahra, Sur Bahir, etc.). Further details about the ratio of births per woman are shown in table 1.

There are differences in this social distribution of residential quarters such as Harat Al-Nasara, a relatively poor area, among those quarters with low fertility, and Harat Al-Sa'diya and Salwan, two urban areas among those with high fertility similar to that prevailing in the rural areas. However, these areas constitute a useful base for making conclusions on the fertility rate expected in the remaining Palestinian areas.

As for the possibility of considering the demographic conditions of Al-Quds and their relationship to the social features of the population similar to the general demographic characteristics of the West Bank and Gaza, it should be pointed out that in the first 20 years of occupation, Al-Quds society was subject to administrative and juridical changes imposed by the

¹ It is worth noting that 22 per cent of Christian women are non-Arabs (members of Christian and cultural missions, etc.). Thus, the proportion of single women in this group must be very high, distorting the general average. See Schmelz, *op.cit.* pp. 80 and 99.

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Israeli authorities distinguishing it from the administrative and juridical status prevailing in the remaining occupied territories. Two points related to fertility and general population growth should be mentioned: (a) the National Security Establishment and the child allowance it provides; and (b) the presence of health facilities available to the population of Al-Quds unlike those available in the West Bank and Gaza, affecting child mortality rates. The next section of this study will point out that the effect of the child allowance on the 1948 Arabs' fertility rate was exaggerated, while the characteristics of the social structure in Al-Quds and those of the West Bank and Gaza are harmonious rather than different.

Table 2, illustrating the vocational structure of the three areas, shows harmony in the distribution of vocational groups between the West Bank and Gaza in 1987 and a partial difference in group distribution between Al-Quds on the one hand and the West Bank and Gaza on the other. The difference is mainly in the upper groups (professionals), which make up less than half the total in the West Bank and Gaza than in Al-Quds, 8 per cent against 18 per cent, and in the lower group, i.e., unskilled workers, who constitute 22.5 per cent of the total vocational distribution in the West Bank, compared with 8.2 per cent in Al-Quds.

Because of the lack of sufficient data on the West Bank, it is not easy to identify a direct relationship between vocational groups and fertility patterns in the three areas. Table 1 presents a clearly-defined relationship between three class variables and fertility. These variables are: (a) the proportion of females in academic, administrative and professional jobs; (b) number of years of study; and (c) proportion of female workers. All variables show correspondence between fertility rates and social status. In the most important of these variables, the fertility rate of families whose heads belong to professional/academic

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groups is the lowest (4 births per woman) in the quarters of the higher professional groups where 30.3 per cent have academic and administrative jobs. In the second group, the next fertility rate is 5.6 births per woman in those families where professionals make up 61.2 per cent of heads of households. In the third group, it rises to 6.8 births in rural areas where professionals constitute less than 10 per cent of the total employees.

Table 2. Palestinians by vocational sectors in the West Bank, Gaza Strip and Al-Quds

Vocation	West Bank 1987 (percent- age)	Gaza Strip 1987 (percent- age)	Al-Quds 1983 (percent- age)
Professionals in academic and scientific sectors	2.4	1.8	5.0
Other professionals	5.6	5.9	12.9
Managers and administrators	1.1	1.3	0.9
Office employees and clerks	2.5	2.2	8.5
Sales employees	10.1	11.4	11.0
Service employees	8.0	8.5	17.7
Agricultural workers	20.6	18.1	1.7
Technicians and skilled workers	27.2	31.7	34.1
Unskilled workers	22.5	19.1	8.2
Total	100.0	100.0	100.0

Sources: Israel, Central Bureau of Statistics, Israel, Statistical Yearbook of Israel, 1988 pp. 730-731; Israel, Jerusalem Institute for Israel Studies, 1988, pp. 8-10.

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This comparison between the social status and prevailing fertility pattern is supported in the few available field studies on the West Bank and Gaza. For instance, in Giacaman's study (1988, p. 94) the total fertility of three villages in the West Bank was estimated to be 8.67 births per woman in 1981 on the basis of a study of 467 women of child-bearing age. "There is a strong relationship between the number of children under three and the educational level of their mothers. Women with 6 or more years of schooling gave birth to one or two children. It is also noted that the number of children below three is low in those families with a high income" (ibid., p. 122).

In this context reference should be made to a frequent phenomenon in third-world societies, namely the rising number of children in poor families in areas where children constitute a major source of economic and social security. In such societies the effect of hired labour, increasing neglect of land and absence of the welfare sector, in addition to military occupation and a general feeling of instability all contribute to rising fertility rates as the only guarantee for the family future. These variables are more important than other adverse factors in determining fertility rates (ibid., p. 152). Giacaman's data on rural fertility support Claude Meillassoux's statement on the relationship between child-bearing and income in rural areas and the outside world. He says that, contrary to expectations, rural women's fertility rises with the decline of the role of the family's farm in supporting the family and with the entry of the family's members into relations of paid work in urban economy. Meillassoux's interpretation of this phenomenon lies in considering having more children a form of social security for the family's future as a result of instability resulting from the decline of the family farm (Meillassoux, 1983, pp. 50-61). However, this statement is not sustained by the rural fertility trend among the population of Galilee, who have been affected by the

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transformation process longer than the population of the West Bank and Gaza. It is appropriate to reconsider such a claim using a larger sample from the rural West Bank.

Fertility in Gaza Strip and the Missing Class

The situation in Gaza, both the city and the strip, seems more complicated. The only data available to us on fertility in Gaza, in addition to official statistics, are from Scott's study in 1985, already cited on fertility and child mortality related to 1121 married (and previously married) women. The total fertility rate during 1980-1985 was 7.01 children, a figure very close to the official figure for 1980-1984 (Israel, 1987) with a difference of only 3 per cent.

Scott's study shows that the total fertility rate of women with 10 years and more of schooling (26 per cent of married women aged 15-49) was only one child below the general rate (6.2 compared with 7.01)(Scott, 1985). It is possible to explain this slight decline by four factors, all of which apply to the West Bank also though with a stronger effect: (a) the marriage age of educated women is relatively late; (b) the number of unmarried women with low education is relatively high; (c) fertility of married women with less than 10 years of schooling is low; (d) the use of contraceptives, especially the loop, has increased due to the rising level of education.

What is astonishing in the demographic conditions of Gaza is that there is a very slight difference in fertility rates between different social classes based on the husband's job or education as an indicator of the family's social class. Although table 2 does not show any significant differences between the professional groups in the West Bank and Gaza, as is the case in Al-Quds, class plays a crucial role in the variation of fertility rates in Al-Quds, as is the case in the

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West Bank, while this factor has almost no effect in Gaza. How can this exceptional position of Gaza be explained?

Class fertility is a cultural phenomenon linked to life-style as much as to the family's material living standard. It is possible that well-off households with high education in the Gaza sample who have adopted the "small family" ideology have emigrated from the old town (Al-Shujai'ia) and the refugee camp to "bourgeois" quarters such as Al-Rimal, while families with a high level of education and traditional position have retained their residences in Al-Shuja'iya and Al-Shati' when their financial situation improved. There is a more general interpretation for this phenomenon; the class situation in the city of Gaza cannot be figured out, when considering the class life-style on the basis of professional groups only. The West Bank is characterized by a class distribution in which professional middle-class groups with high education and low fertility have a larger proportion and a higher status than their counterparts in Gaza. (Tamari, 1990). While there is a very high polarization in Gaza Strip between the lower classes on the one hand, and landowners and capitalists on the other hand, at the top of the social hierarchy the role of middle-class groups disappears. To agree that these middle groups are responsible for variation in social fertility patterns provides the main key which explains the difference between the Gaza Strip and the other occupied territories.

Following is a summary of the notes on fertility patterns in Al-Quds, Gaza and the West Bank and their relationships to the social structure. Figure II shows the results of similarities and differences for each region arranged by sex and age. Al-Quds is divided into three demographic areas, as in table 1.

The different results of fertility in population pyramids clearly illustrate the impact of

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social composition. The demographic structure of the middle-class quarters shows a pyramid with characteristics close to the fertility rates of industrial European and Asian countries in the narrow base and the relatively broad top, while distribution by age and sex is similar in the remaining poorer quarters in Al-Quds and rural areas (pyramids B and C) to that of the West Bank and Gaza Strip. Pyramid D shows the demographic consideration prevailing in those third-world countries adopting urbanization and industrialization, such as Algeria and Mexico, with a broad base and a relatively narrow top. It is possible to ignore the apparent increase in above-65 age groups and attribute the phenomenon to the tendency among aged persons to reduce their true age and raise the age of other old people in the family. The special characteristic of the pyramid of the West Bank and Gaza is the clear imbalance between various sex groups in the 35-49 age group resulting from the high emigration of males to the Gulf and to North America and Latin America. Apart from this, the broad base of the age group zero-14 of both sexes in pyramids B, C and D shows the outcome of the general population growth resulting from rising fertility. What is more important than this is the considerable decline in child mortality in the 1960s and 1970s (Al-Maqbool, 1987; Giacaman, 1988).

Let us now turn to the interpretation of the considerable decline in the total fertility rates in the occupied territories starting in the mid-1970s and in Galilee in the early-1970s. This decline is still continuing, as shown in Figure I. Such interpretation leads to a review of the historical dimension of Palestinian women's fertility as reflected in the conditions of Palestinian Arabs inside Israel.

Historical Dimension of the Trends of Palestinian Fertility in the Occupied Territories

The Arab population in Israel, mainly in

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Galilee, has been under Israeli occupation for twice as long as that of the West Bank and Gaza. The structural effect of Israeli control on Arab demographic changes had results which were later repeated in the territories occupied in 1967. The major factors leading to this were: confiscation of agricultural land, and the fact that many Arab peasants have turned into workers; rapid urbanization as a result of internal migration; and State intervention in the Arab family's affairs. It is possible to view these changes as a precedent which has historically dominated the fertility factors to which Palestinian communities in the West Bank and Gaza have only been partially exposed.

There are two major fertility trends emerging among Palestinians in Israel itself. The fertility rate rose from 7.3 births per woman in 1955 to 8.4 in 1964 and fell sharply after 1970 to 4.3 in 1968 (figure I). On the other hand, the falling trend in the second half of the 1960s suddenly dropped in 1967 and then slightly rose; it has continued to decline since then.

In a study on the relationship between economic changes and Arab fertility trends in Israel itself, Ben Porath sees a constant relationship between high unemployment rates and low fertility rates among Arabs in 1960-1970 (Ben Porath, 1973, pp. 185-204).

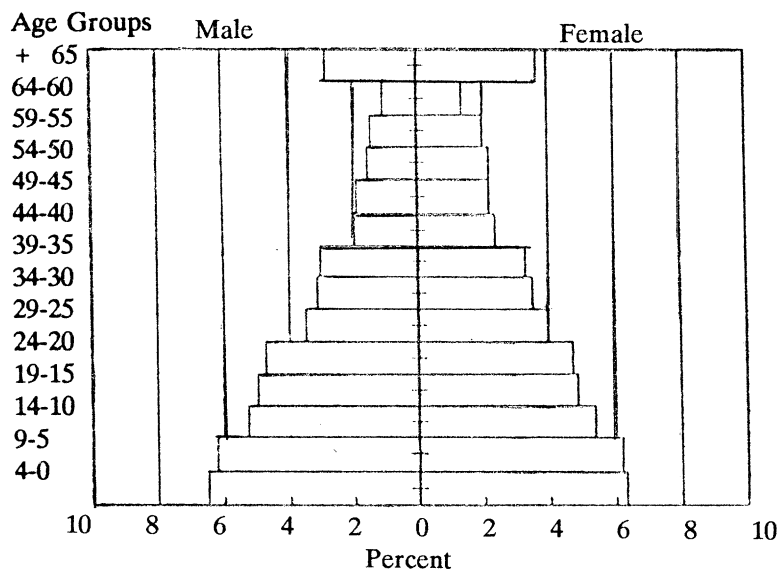
The historical background of these structural changes includes economic restrictions, as well as expropriation of agricultural land in the first 20 years after the establishment of Israel, leading to the transformation of the majority of the rural population into workers in Israeli production sectors, and consequently, their gradual migration from rural areas.

These changes have led to important changes in the marriage age and in Arab women's fertility. At first, the average marriage rate of women rose to over 20 years in 1957-1961 and 1964-1968, despite

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FIGURE II. **Distribution of age groups and sex in Al-Quds (Jerusalem) by social class, 1983, and in the West Bank, Gaza Strip, 1984**

(A) Jerusalem: Middle class quarters



(B) Jerusalem: Working class quarters

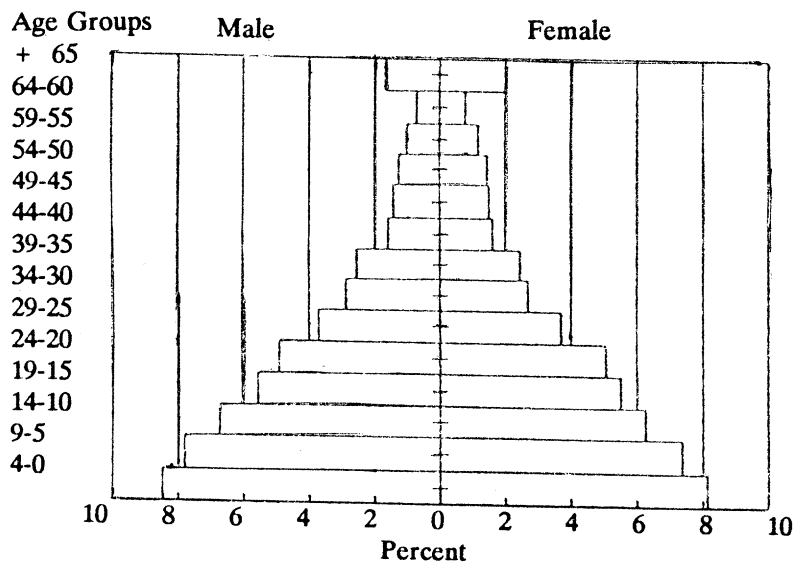
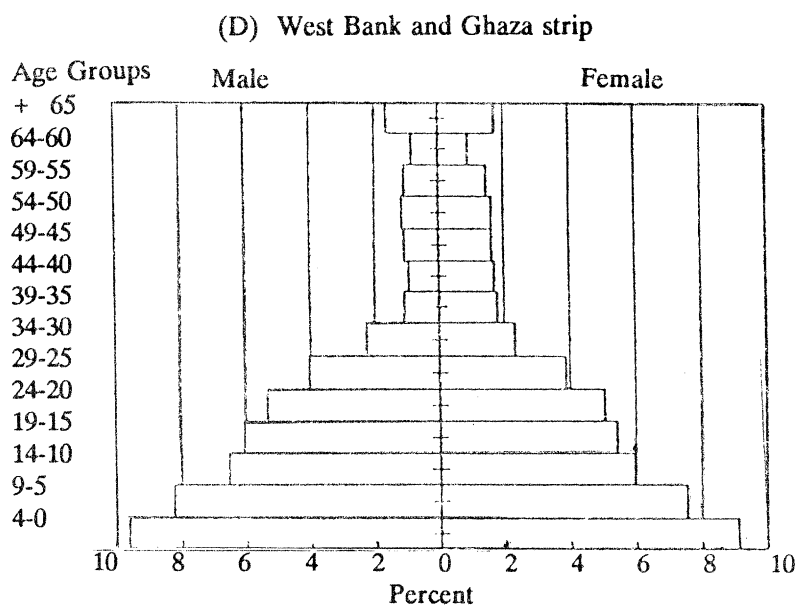
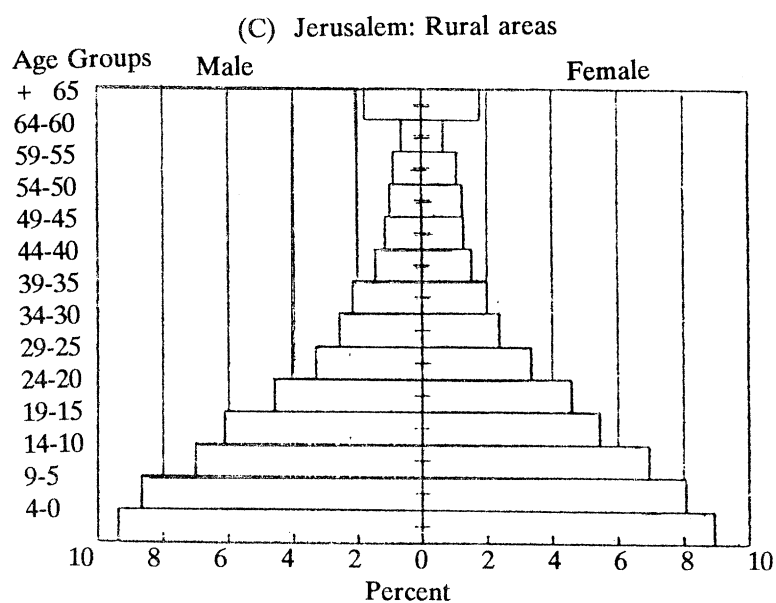


FIGURE 2. (continued)



Sources: Data for Al-Quds (Jerusalem) is derived from Israel, 1985, pp. 36-77; Data for West Bank is derived from Israel, 1987, p. 33.

Note: For fertility rates, see table 1.

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the slight decline in the early 1960s (Israel, 1983, p. 14). One of the main reasons for the rising marriage age during this period were the difficulties faced by those wishing to get married, especially unemployed youths in paying the dowry to the bride. However, the situation changed in the early 1960s when the rising cash income from paid work in Israeli production sectors led to a drop in marriage age and raised the number of births by about 5 per cent compared with the 1950s. During that brief period (1960-1964) a strong link was noted between paid work in non-agricultural sectors and the rising fertility of most groups of the Arab population.

The steady trend of falling fertility rates and rising marriage age has prevailed at last. In 1986 the total fertility rate was 4.26 children. It is noted that the maximum decline was in the above-35 age groups, compared with the same groups in the 1970s. Fertility in the 15-19 age group has also started to fall since 1972 (op. cit.).

The 1983 census data show a clear link between fertility trends and two important factors: the period of schooling completed by the wife and the husband's profession (figures III and IV). The data indicate a large number of children in those families whose heads have agricultural, service and unskilled jobs (8 to 9.5 children) and a smaller number of children for those in administrative, academic and professional jobs (5 to 5.6 children) (op. cit.).

Figure III also shows an inverse relationship between the mother's education and the number of children in families where the mother has had fewer than 4 school years of education (9 children) compared with 2.5 children in families where the mother has had more than 13 school years of education (op. cit., pp. 243-246). It is also possible to conclude an inverse relationship from the census between the family income and fertility

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rates (op. cit., pp. 266-277 and 286-287).

Figure IV shows that those with higher professions (academic, managers and professionals), who are not necessarily the richest people, were the first to adopt the "small family" concept. Their income enables them to do without their children's contribution to the provision of an acceptable standard of living for the family. They can also depend on their savings and pensions to maintain such independence in their old age. They were also the first to adopt educational values based on stressing the quality of education rather than the number of children. Thus the education of their children becomes a costly objective, reflecting the family's aspirations and pride in their children's achievements. In these same families, there is a tendency to provide higher education for the girls to make them suitable brides for professionally qualified young men.

Finally, reference should be made to the relationship between fertility and child mortality. In general, demographers believe that a major reason for high fertility in developing countries is the parents' desire to make up for the loss of children as a result of early death. Thus the ideal size of the family at a given time and in a certain social group will be affected as a result of the falling child mortality rate. It is also noted that a long period (about a decade in Palestine) separates falling mortality rates and corresponding falling fertility rates. This may be one of the reasons for the considerable growth of the size of the Arab family in the 1960s and 1970s, despite no rise in fertility rates (Israel, 1988b, p. 141; Schmelz and Kenvin, 1977, p. 62).

Fertility and Child Allowance

The provision of a child allowance has aimed at promoting the Jewish fertility policy adopted by the Israeli authorities at the time of Israel's

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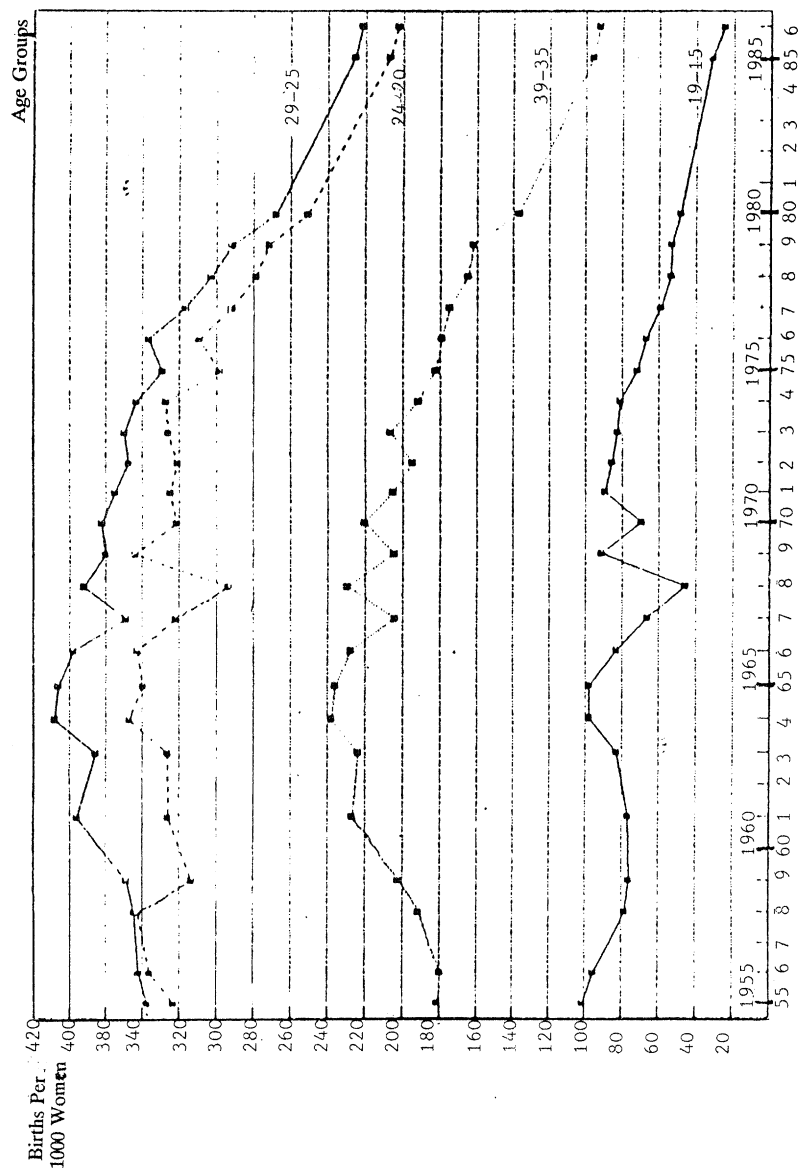
establishment. This is clear from the plan announced at the time, which called for the support of "high-income and small Jewish families to have more children" (Friedlander, et al., 1979 p. 140).

However, the child allowance later became a financial aid to large poor families. Despite several attempts to exclude Arab families from this scheme (by limiting it to the families of soldiers who complete their military service), the allowance scheme has been used as a major source of income for families with low income, including Arab families. In 1960, the first year of the establishment of the allowance scheme, the allowance constituted between 5 per cent and 19.2 per cent of the monthly income of the family with an average of 9.5 children (Honig, 1974, p. 17). The rates gradually rose to 9.8 per cent and 21.3 per cent in 1970, constituting 22.6 per cent and 48.6 per cent of family income (op. cit.). This means that half of the monthly income of families with 9 children in 1973 was from child allowances. These figures are for the total population. As for the Arab population in Israel, the child allowance payments probably exceeded the above figures, because the average monthly allowance of the Arab citizen in Israel was 30-40 per cent lower than that of the Jewish citizen while child allowances were the same (Friedlander, et al., 1979, p. 246). Friedlander and Goldscheider state that in the late 1970s and early 1980s "the child allowances at their present level constitute a strong incentive to fertility among Arab citizens in Israel, much more than the case in the 1960s" (op. cit.).

The truth is exactly the opposite, as Arab fertility dropped from 8.42 to 7.23 children between 1965 and 1974, during which the child allowance doubled. The reason might be that the additional child allowance in a large family did not constitute a sufficient incentive for having more children. This may not apply to very poor families, but it applies to most other families. It also applies to the fertility of Al-Quds women in a later period and

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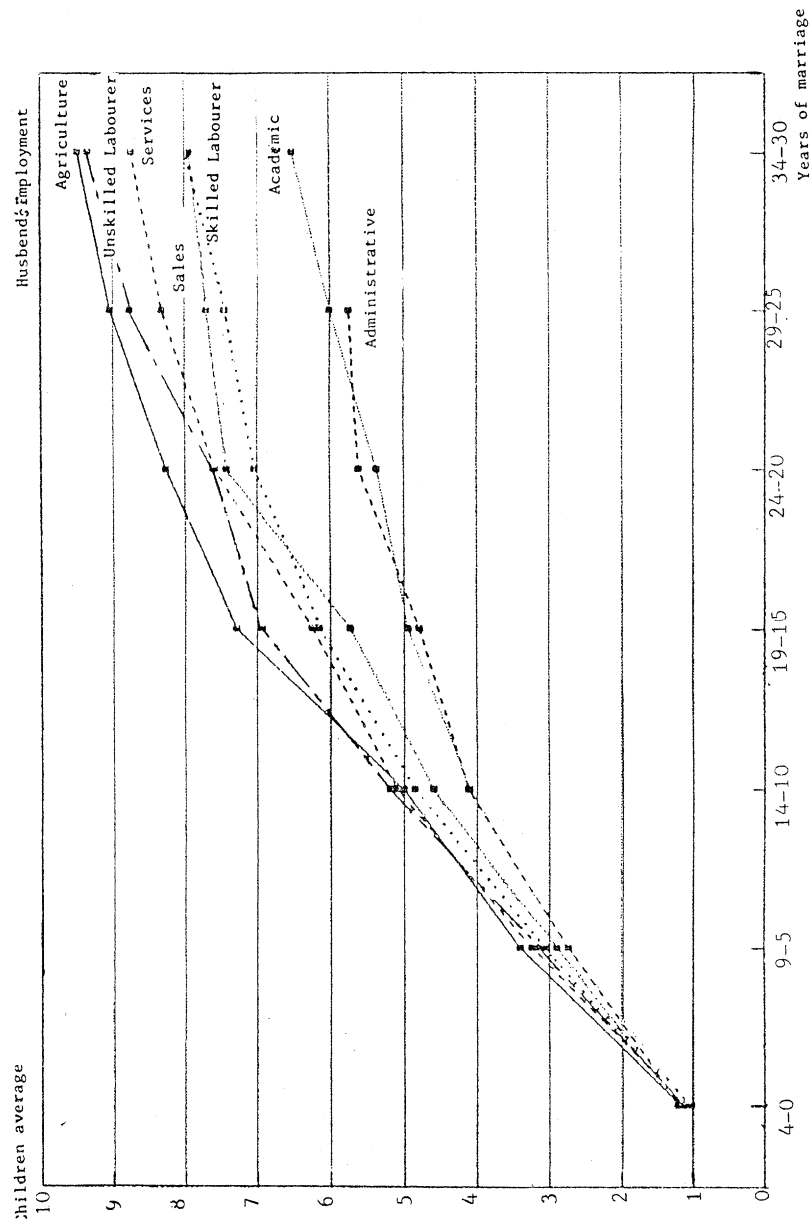
Figure III. Palestinian fertility rates by age groups for 1984.



Source: Israel, Central Bureau of Statistics, General Population Census, 1983, vol. XIV.

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Figure IV. Average number of children per woman (first marriage) by number of years of marriage and husband's occupation



Source: Israel, Central Bureau of Statistics, General Population Census, 1983, vol. XIV, pp. 274-275.

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to the Palestinians in Israel itself, as shown in figure I.

The main conclusion to be made is that the importance of children in supporting the family economically appears when the parents are old, and during the period when children reach the production age and contribute economically to support the family's income. Thus the decision on having an additional child is not mainly dictated by the child allowance. It can be stated that although high fertility rates among Arabs have fallen, they are high despite the child allowance and not because of it.

Fertility and the Intifada

There are not enough data to draw clear conclusions on the effect of the intifada on Palestinian fertility. However, the scarce statistics based on the registers of courts and birth records at local hospitals show two trends which probably positively affect fertility rates. The first trend is the increasing number of girls' early marriages; the second trend is the considerable fall in the number of divorces. In this respect Rashad Al-Madani, for instance, points out that in Gaza there was a fall in the number of divorces from one per 10 marriage contracts in 1987 to one per 16 marriage contracts in 1988 (Al-Madani, 1989, p. 38).

It is certain that the social solidarity prevailing in the cities and countryside of the occupied territories during the intifada played a crucial role in containing family disputes which had previously led to divorce as well as in reducing dowries which had constituted a major obstacle to early marriage (Al-Tali'a, 1988). There has also been a tendency, especially in rural areas, to make girls marry at an early age, even if this means accepting lower dowries than before, which had previously affected the family's status. Conservative families' fear of their daughters'

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involvement in political activities or in the daily spontaneous clashes with Israeli soldiers has prompted them to push their daughters to marry at an early age (Al-Manasra, 1989a, pp. 24-31). All these factors combined are expected to lead to a considerable rise in fertility rates, which will undoubtedly reverse, or at least curb, the recent decline in fertility rates. The decline is not expected to bring back the same rates of the past decades. This conclusion is made when considering the increased marriage rates during the intifada compared with the preceding period, as shown in table 3.

Table 3 shows that the acceleration of crude marriage rates (total marriages per one thousand people) declined in 1988 as compared to 1987. In addition, the considerable increase in marriages in 1987 (13.1 per thousand as compared to 10.7 per thousand in 1986) does not reflect the conditions of the intifada as much as it is a reaction to other social and economic conditions which are not yet clear. In brief, not enough time has passed to allow any constant generalizations on the effect of the intifada on fertility.

Conclusions Regarding the Ideological Position and Structural Effects

Unlike the situation in many third-world countries, the Palestinians do not have an official policy towards fertility. The Palestinian Liberation Organization's relationship with the occupied territories does not allow it to apply a practical demographic plan to the population of the West Bank and Gaza. However, there is an implicit ideological position and a declared demographic programme on the population trends favoured by the Palestinian people. The implicit ideological position currently adopted by the majority of charitable and women's organizations in Palestine towards family planning (Arab Women's Federation, Family Promotion Society, Federation of Charitable

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Societies, and Red Crescent) is based on absolute support for the large family and implicitly criticizes of the use of contraceptives except when necessary. This position considers high fertility a necessary demographic weapon to face the "Israeli evacuation" policy. The only exception to this trend is the position of the Society of Family Planning and Protection, which aims through its clinics to create a "balance between population and natural and production resources" and "to emancipate and develop women and involve them in development programmes ... through promotion of family education" (West Bank, 1979, pp. 2-3). This society provides wide-scale services and medical consultation on means of family planning and contraceptives throughout the West Bank.

Table 3. Marriage rates in Gaza, before and during the intifada

Year	1986	1987	1988
Total population (thousands)	545.0	564.1	583.3
Marriage contracts	5,846	7,410	8,308
Crude marriage rate	10.7	13.1	14.2

Sources: Israel, Central Bureau of Statistics, Statistical Yearbook for 1986 and 1987; Rashad Al-Madani, "Gaza Strip and readings of the 1989 statistics", Al-Bayader Al-Siasi, No. 347 (May 1989) p. 38 (in Arabic).

The features of the "declared demographic programme", being the nearest thing to an official Palestinian position, evolved in the recommendations of the Seminar on the Demographic Characteristics of

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the Palestinian People held in Tunis in 1984. The recommendations include a plan for a population policy as well as a definite position towards Palestinian women's fertility. The main objective of the population policy is "population settlement" in the West Bank and Gaza which is achieved through positive policies such as support of development investments, tying the farmer to his land, development of a technical and technological plan to admit school and university graduates, etc., as well as through exerting pressure to restrict Palestinian migration to Arab countries and pressing the Soviet Union and other European countries to curb Jewish migration to Israel, etc. (Arab Institute of Statistical Research, 1985, pp. 617-618).

The position as regards fertility involves the following points: (a) encouraging Palestinian women to have more children; (b) providing mother and child health care services in order to reduce the rates of child mortality and abortion; (c) working out a plan to promote health services in the occupied territories; (d) providing health services for the labour force and recruiting the necessary training and educational personnel; and (e) improving the housing and health conditions in the refugee camps.

It is clear that the above recommendations, except those concerned with investment, belong to the world of wishful thinking. How can "Palestinian women be encouraged to have more children?" Are the points related to investment (development plan, provision of services, training, etc.)? What is the practical translation of calling for more children? To stress the conditions of the refugee-camp population in calling for the improvement of health housing conditions overlooks the fact that health conditions in the refugee camps are better than in numerous Palestinian villages and poor quarters in the cities. What is even worse, in addition to being difficult to implement, the call for higher fertility involves a utilitarian attitude towards

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Palestinian woman. Unfortunately, such utilitarian attitudes have crept into the political view of woman's role during the intifada. She is projected as "the mother of heroes", "the martyr's mother" and "Palestine's bride". The attitude towards woman as a maker of human beings, and not of events, an observer and not a participant, is dominant (Abu Ghazala, 1989, pp. 65-76).

Some female Palestinian writers have pointed out this contradiction between woman's prominent role in political activities during intifada, on the one hand, and the increasing monitoring of girls by conservative families, the considerable falling of the marriage age and the rising number of polygamous marriages, on the other hand (Al-Manasra, 1989a and 1989b).

In the view of the writer of the above two studies, any "gains" from the Palestinian woman's rising fertility during this period are not worth the losses resulting from the decline accompanying her status and the impact on her psychological and cultural health.

The main conclusions of the study can be summed up as follows:

1. The crucial change in Palestinian fertility rates in the past 20 years has become dominated by structural effects controlling the family status rather than by the ideological position of society towards childbearing. Structural effects include family location (rural or urban), social class, woman's length of schooling and her work outside home.

2. This generalization does not apply at the same rate to all areas under consideration. The inverse relationship between the family's social status (as indicated by the husband's profession and the mother's period of schooling) and fertility is clear among the 1948 Arabs as well as in rural

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communities, the West Bank and Al-Quds. However, it is a weak relation, as indicated by the limited available data for Gaza.

3. The crucial factor in the high fertility rates among Palestinians, just as in the third world, is the future view adopted by the family towards its own children, first as a major source of work (in the farm or the family's vocation) or income in the case of paid work, and secondly, dependence on male children to support the parents in their old age in the absence of a State social security scheme. The factors causing a decline in fertility are affected by the development of social security in the public sector.

4. There is a clear tendency towards declining fertility rates in the four Palestinian areas. This trend, however, is less sharp in Al-Quds, reflecting the influence of the urban trends of the population. The same applies to the 1948 Arab communities in which rates started to drop in the early 1970s as a result of the vocational and urban variation among the Arab population of Galilee. In the West Bank and Gaza, fertility rates started to fall in middle 1970s. It seems in all cases that there is a lagging relationship between the family's realization of declining child mortality rates and their adoption of family planning. There is an average of ten years between having a larger number of children alive and the family's use of contraceptives. This means that for now, at least, declining fertility rates will not lead to a decline in the natural population growth in the West Bank and Gaza, while there is some decline in the natural population growth of Al-Quds and Galilee.

5. The available data do not prove Meillassoux's theory on the expected increase in fertility rates as a result of farmers becoming workers, which is the means employed to face unstable life conditions based on a subsistence economy. There was partial support for this statement at the start of the

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change among the Arab population in Israel in the 1960s. However, this trend was reversed in the late 1960s, the period when involvement in industrial production reached its climax.

6. It seems that there is a connection between the ideological position supporting fertility that has been adopted by national political organizations and movements, and effective fertility rates. On the contrary, available data show that low fertility rates emerged when the concept of "demographic struggle" to face the Israeli "evacuation policy" in the 1970s and 1980s was introduced. The main reason for this change was probably the sophisticated structural changes inside the Palestinian family which have consolidated the adoption of the "small family" objective. One of the factors affecting the adoption of this object is the religious or racial attitude of the family towards the use or non-use of contraceptives, a variable not examined by the present study.

7. It is ironic that in the only available cases in which the State has adopted an official policy of encouraging fertility through child allowances, as is the case in Al-Quds and Galilee, the results show also an inverse relationship between rising allowances and fertility rates. It is clear that such a relationship is accidental and not causal, accompanying the emergence of the modern family in urban centres, the predominance of the "small family" ideology in the middle classes and the growing employment of women outside home, all of which are variables contributing to declining fertility rates.

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A System for Collecting Vital Statistics in Gulf Cooperation Council Countries

Mustafa Al-Shalkani

Introduction

Arab Gulf countries lack a clear-cut and well-defined population policy. Each one of them has its own population policy; in general, each adopts comprehensive plans for socio-economic development,¹ or directs its policy towards attaining specific objectives related to population conditions, such as provision of accommodation and free education as well as improvement of public health facilities and others.

The population in any Gulf State is divided into two distinct groups, nationals and migrants. The community of nationals can be regarded as being closed to international migration; members increase through births and decrease through deaths, in addition to the few persons that are naturalized every year. This means that the dynamics of change in the population are essentially due to the first two factors. The migrants are composed of various nationalities and are subject in number and composition not only to the policy of the host country, but also to the policies of the sending countries.

Since the advent of development in the region, each country has been determined to utilize its oil revenues to build its socio-economic structure. Results included expansion of the labour market and growing demand for labour. In the past few years,

¹ *Apart from Bahrain all GCC countries have used one or more development plans covering socio-economic programmes. For further information on such plans and their dates, see E/ESCWA/STAT/85/WG.1/BPS.*

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a migrant labour force covering all vocations and all fields of economic activity has become involved in one of the largest and most significant migrations of labour in modern times. The size of the migration has not only been large compared with the original population but has had direct consequences for the identity and nature of society and for the behavior of its citizens (Abu-Halika, 1987).

Gulf Cooperation Council (GCC) countries have witnessed an increase in population exceeding all expected rates of increase; population growth elements were a major cause for such high rates. Therefore, there is a growing interest in vital statistics and their sources, as well as in defining the role which can be played by each source in describing the prevailing demographic conditions and predicting future trends. From a demographic point of view, the two main sources of vital statistics are the census and registration data.¹ In practice, three possible groups of Gulf Cooperation Council countries can be defined as regards these two sources: (a) countries where both censuses and registration data are available with a reasonable degree of accuracy, such as in Kuwait; (b) countries with one or more censuses as well as a system of vital registration or with one system that is not yet developed (this applies to the majority of GCC countries: Bahrain, Qatar, Saudi Arabia, and United Arab Emirates); and (c) countries in which neither source is available, which applies to Oman, the only country in the region without a census or vital statistics.

¹ In addition to these two sources there are complementary or substitute sources. The State may keep a population register to provide complete vital statistics and may conduct sample surveys to obtain additional data not collected periodically from other sources. For further details see: El-Asad and Rizk, 1976.

Vital Statistics

Advanced countries have made considerable progress in the organization and implementation of the various stages involved in compiling the two sources. They also have a developed statistical system completely dependent on the data provided by the two sources. This raises questions on the level of the population data sources in GCC countries on the one hand, and on the validity of a comprehensive strategy to collect data from such sources on the other. It is necessary to examine this situation, because there are limits to the requirements and accuracy of such data. Moreover, human, material and technical resources are limited, which require making a number of decisions on the most needed data and periods (Kannisto, 1978).

Present Situation of Population Data

Censuses

Censuses in GCC countries were not taken regularly, apart from Kuwait and the United Arab Emirates, where a census has been taken once every five years.

Seven censuses have been undertaken in Kuwait. The first three were in 1957, 1961 and 1965, i.e., once every four years, and from 1965 to 1985, censuses were taken every five years. The number of censuses in Kuwait makes it a pioneer, not only among GCC countries, but also among Arab and Asian countries. Censuses in the majority of these countries are taken at intervals of ten years or longer. In a limited number of these countries, a sample census is taken at intervals of five years between each two main censuses.

In Bahrain the first census was taken in 1941. The next two censuses were in 1950 and 1959, i.e., at nine-year intervals. The fourth census was in 1965, due to the fast population growth and construction in the country and because of the desire by those in charge of statistics to provide data on the population. The fifth census was

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taken in 1971, followed by the sixth and most recent census in 1981.

Four censuses were taken in the United Arab Emirates: in 1968, 1975, 1980 and 1985. The first census was no more than limited data collected on certain characteristics of the population and their distribution by age, sex, religion, vocation and educational level. The next three censuses contained several tabulations. However, there was a major defect, namely, that the published data covered the whole population of the country without division into nationals and non-nationals. Because of the large non-national population, constituting about 70 per cent of the total population, this situation was reflected in the assessment and analysis of the census results.

Qatar is one of the least experienced Arab Gulf countries in population statistics. The detailed results of the 1986 census were published recently, but only a small number of tabulations based on the results of the April-May 1970 census have been published.

Like Qatar, demographic data for Saudi Arabia is limited when compared with that available on the rest of the countries. Only one census was taken in Saudi Arabia, in 1974. Although it was the first comprehensive national census, there are indications of lack of accuracy and comprehensiveness. The attempt to take an earlier census in 1962-1963 was incomplete.

Oman is the only GCC country where no census had been taken up to the date of the present study. This situation has been reflected in the different estimates on the Oman population published from time to time. For instance, in 1975 the authorities estimated the total population of Oman at 1.5 million, while United Nations estimates for the same year were only 766,000, i.e., about half the official figures (United Nations, ESCWA, 1987a).

Vital Statistics

The above review shows censuses have not been held regularly; this is expected to be the case in the future, as well. More than 14 years have passed since the only census in Saudi Arabia was taken. There have been proposals in Kuwait to take a comprehensive census at 10-year intervals, starting from the 1995 census, and to take a sample census in the middle of the period.

Registration Statistics

Registration data in GCC countries is relatively recent. In Kuwait, the first vital registration in 1952 was not comprehensive. In 1960, the first law to organize the registration of births and deaths on a compulsory basis was issued. When this law was first applied, six health offices were set up, but this arrangement did not help make the registration more accurate.¹ The authorities had to issue law No. 36 of 1969 to organize the registration of births and deaths, which cancelled all the prevailing laws. The amendments covered the procedures of the system as regards notifications and their contents (Kuwait, Ministry of Health, 1986).

Vital statistics in Bahrain are the second source of demographic data. A law to organize the registration of births and deaths was made. However, the law lacked some necessary provisions which secure commitment to the law, which caused considerable inadequacy in application. In general, it can be said that the registration of births in Bahrain is more comprehensive when compared with the registration of deaths, which are incomplete. At

¹ *The reason for this is that many of the births did not take place at public health centres, especially among desert dwellers. For instance, in 1960 about 900 births were not reported to the Ministry of Public Health (Al-Sabah, 1978).*

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present, the provisions of the above law are being amended in order to include aspects that would make it more complete (Bahrain, Central Statistical Bureau, 1987).

In the United Arab Emirates, there is a system of vital registration, but the data of the register generally lack comprehensiveness.

In Qatar, a system of vital registration was introduced in 1982 making it obligatory to notify the authorities of births and deaths inside the country, as well as vital events concerning Qataris residing abroad.

Saudi Arabia and Oman are the only two Arab Gulf countries which have not yet adopted the vital registration system in the sense normally accepted by demographers, and each of the two countries depends on sample surveys to estimate its vital statistics.

Household Surveys

It is clear from the above review that most Gulf countries are not in a position to depend completely on one or both of the above sources to provide an ideal population database. As a result, they resort to alternative sources such as household surveys.

Kuwait conducted two sample surveys, in 1972 and 1973. In addition, two other sample surveys of the labour force were conducted, in 1983 and 1988, for the purpose of making assessments of the geographical distribution as well as composition by sex and by age of the labour force in the country, in addition to the provision of data on vocations, education, economic activity and various other demographic variables. As regards other GCC countries, it is noted that in each of Bahrain, Qatar and the United Arab Emirates, there is lack of population surveys. In Saudi Arabia and Oman, there

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is total dependence on such surveys to provide estimates of the various elements of population growth. Saudi Arabia depends on multi-purpose household surveys covering five-year periods, starting from 1981. The household survey aims at measuring population changes and trends during the reporting period as well as providing data on the labour force, vital events, vocational training, health, nutrition, spending, housing and work experience. The framework was worked out using the 1974 census. The basic units were capital cities, urban centres and rural areas. Oman depends, in the estimation of vital events and measurement of population movements, on an annual survey to follow up the cases of births and deaths and migration at the national level; the details of the survey have not been published.

Permanent Registration of Population

Out of the six GCC countries, only Bahrain and Kuwait have adopted the above method, although the stages of implementation in each of the two countries varied.

In 1983, the Central Statistical Bureau in Bahrain set up the population register as a third source of demographic data, through which the data of the 1981 census were amended and the changes taking place as regards individuals are followed up (Bahrain, Central Statistical Bureau, 1987).

In Kuwait, there are two district stages of population registration. The first dates to 1977 when an automated information centre was set up at the Civil Service Department. The centre, in cooperation with the Ministry of Planning, started to prepare and apply a personal information system. The purpose of setting up the centre was to modernize public administration and make use of the potentials provided by computers to establish a data bank capable of meeting the administration needs for various data. The second stage started with the

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promulgation of law No. 32 of 1982, which established a civil data system in Kuwait, consisting of a full register of all Kuwaitis and non-Kuwaitis residing in Kuwait and containing detailed data on the civil information relating to them.

Level of Data Accuracy

Demographic data is liable to different kinds of inaccuracy in various degrees. Some of errors are related to the degree of comprehensiveness, while others are related to the content of the sources. Errors in comprehensiveness include cases of incompleteness or duplication, while errors in content may occur as a result of providing wrong information on individuals, or due to cases of non-response arising out of failure to provide information or unwillingness to do so. In addition, incomplete definition of terms and general lack of adherence to definitions in implementation also causes errors in data.

Due to lack of research on post-counting and checks in all GCC countries, it is usually impossible to determine the degree of comprehensiveness and the accuracy of data. It is still possible to present a general assessment of the accuracy of the census through analysis of data by sex and age, which are among the data most prone to errors. Furthermore, some indicators of comprehensiveness can be obtained through analysis of the census data with other available sources or by using population models.

Data by Sex and Age

In practice, the deviation of the sex ratio (number of males per 100 females) from the pattern set for it can be attributed to the following factors: different death patterns, migration waves from and into the region which expose society to unusual conditions, and increasing deaths for either

sex, as well as errors in data.

The data in table 1 show that the sex ratio in young ages almost corresponds to the expected pattern in Kuwait. The low sex ratio in the 15-39 year age-group is due to the naturalization of some non-Kuwaiti females or to considering them as Kuwaitis in the census because they were married to Kuwaitis.¹ The high sex ratio among all age groups of 40 years and older is an error which cannot be explained except by a general tendency among women in the age groups to pretend to be younger than their real age.

In Bahrain, although the number of males in general exceeds that of females among the indigenous population, there are major changes in the sex ratio within age groups. According to the 1981 census,² the female population exceeds the male population in the age groups 15-24, 35-49 and 70 plus. The incomplete number of Bahraini males in the age group of 15-24 can be possibly attributed to their migration to neighbouring Arab Gulf countries, but the low sex ratio in the next age group of 35-49 is difficult to justify. A possible interpretation could be that many non-Bahraini females were regarded as Bahraini females, which would indicate errors in the census.

In the United Arab Emirates, the census data show that the male population was more than twice the female population in all age groups. In addition, half the male population is in the age group 20-34. Their proportion is four times that of

¹ *On the factors causing a low sex ratio among Kuwaitis see El-Shalkani, 1958.*

² *This applies not only to the 1981 census but also to the data published earlier in which there was incomplete registration in several instances.*

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the females in the same age group and more than four times the proportion of the males of the age group 15-19.

Table 1. Sex ratios by age in selected GCC countries, 1980-1981

Age Group	Kuwait	Bahrain	Qatar	U.A.E.
0-4	100.9	103.0	112.0	103.4
5-9	102.4	101.3	90.0	103.0
10-14	100.9	100.9	91.0	110.5
15-19	97.1	97.1	102.0	112.6
20-24	88.9	95.8	89.0	102.9
25-29	86.8	107.5	81.0	93.5
30-34	83.1	113.6	84.0	102.1
35-39	98.6	87.4	79.0	97.5
40-44	109.4	87.5	91.0	119.1
45-49	110.4	98.9	91.0	124.6
50-54	115.3	107.9	133.0	130.1
55-59	105.4	128.0	119.0	131.6
60-64	103.0	120.3	159.0	121.7
65-69	110.1	119.6	133.0	153.4
70-74	-	97.6	112.0	134.2

Source: United Nations, ESCWA, 1985a.

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In Qatar the 1986 census¹ showed incomplete and inaccurate notification with respect to age, as illustrated by sex and age distribution of population. For instance, there is a considerable increase in the number of males of all age groups at varying degrees. The number of males is more than twice that of females in the 20-24 age group is more than three times in all age groups between 25-54, and is almost four times their number in the 25-29 age group.² It is obvious that this defect is partly due to the considerable increase in the number of male expatriates, but it is also partly due to inaccurate census data.

In Saudi Arabia published data show that Saudi males make up 51.4 per cent of the population, i.e., slightly more than half the total population. Still, the disparity between the two sexes in various age groups is clear (United Nations, ECWA, 1981c). Although figures reflect reasonable sex ratios among infants (105.2), the number of males exceeds that of females in the 1-4 age-group. Among those whose ages range between 10 and 24, the number of males was considerably higher. Moreover, males are 41 per cent more than females in the 60-64 age group, a high percentage which can only be attributed to error.

The application of demographic indicators--such as the Whipple Index, Myer Index and United Nations Secretariat Method--to data on Kuwaitis during the census years shows improved reporting of age in census although the level is still inadequate. For instance, the figures related to the first and

¹ See *Population and Houses Census, March 1986, Table 1/2 pages 9-11 (Qatar Central Statistical Organization, 1987).*

² Such defects are also found in the first census in 1970. See also: *United Nations, Economic and Social Commission for Western Asia, 1981.*

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second indexes show the phenomenon of heaping with clear preference of ages ending with zero or five. The volume of such error as regards females is higher than that related to males. For example, the results of the application of the third index also confirm irregularity of age data even after arranging the data in five-year groups.

Table 2. Ratio of observed and stable distribution by sex and by age in selected GCC countries, 1980, 1981.

Age group 1980	Males				Females			
	Kuwait 1980	UAE 1980	Bahrain 1981	Qatar 1981	Kuwait 1980	UAE 1980	Bahrain 1981	Qatar 1981
0-4	1.05	.97	.89	.92	.97	.05	.89	.83
5-9	1.09	1.01	.93	.97	1.03	1.09	.95	1.08
10-14	1.10	.93	1.04	1.41	1.05	.90	1.06	1.33
15-19	1.03	.90	1.34	1.43	1.04	.89	1.31	1.40
20-24	.98	.81	1.30	1.13	1.09	.76	1.38	1.37
25-29	.97	.87	1.10	.84	1.06	.93	1.04	1.03
30-34	.83	.81	.85	.65	1.01	.85	1.35	.78
35-39	.91	1.09	.69	.69	1.00	1.18	.80	.86
40-44	1.04	1.13	.71	.73	.96	1.04	.95	.70
45-49	.89	1.18	.97	.75	.87	1.07	.98	.83
50-54	.88	1.40	1.13	.99	.85	1.30	1.03	.73
55-59	.74	.99	1.09	.64	.77	.87	.83	.53
60-64	.85	1.94	1.17	1.02	.89	1.43	.91	.60
65-69	.61	1.64	.90	.77	.67	.92	.68	.53
70-74	.76	1.84	1.04	.80	.77	1.59	.90	.53
75+	.96	1.93	1.30	.49	.71	1.59	.91	.53

Source: United Nations, Economic and Social Commission for Western Asia, 1985a, pp. 26-38.

Table 2 shows that the values calculated by using this index were of much higher levels than the optional percentage (9.5 per cent) established by the United Nations Secretariat Method (Kuwait Central Statistical Office, 1988).

Comparing the Age structure of observed Society with the Age Structure of Stable Society

This comparison aims at throwing more light on the errors in the vital registration of various age groups. This approach can be summed up in the selection of a stable community parallel to the observed community and calculating the ratio of the population observed in each age group to the parallel population in a stable community. In demographic terms, the quotient of the two populations is whole when the two distributions are equal. If the quotient is more than one, it implies the presence of an extra count in the population of the age group as a result of migration of people from neighbouring groups. If the quotient is less than one, there is a deficiency in the count as a result of the migration of members of this population to other neighbouring groups.

Because of lack of data in Saudi Arabia and Oman, the analysis has been limited to the four remaining countries. In Kuwait, Bahrain and the United Arab Emirates, the data of the latest census were used. In Qatar the analysis depended on the results of a field study conducted in 1981 on the demographic and economic characteristics of the family in Doha.

When choosing the stable community, life tables-south (Coale and Demeny, 1966) were used, and when defining the death level in these tables, life expectancy at birth in the community under study was used. The annual growth rate was used to calculate the stable age structure. Calculations for males and females were conducted separately; the results are listed in table 2.

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Comparison confirms the presence of defects in the data. The ratio between actual and stable distributions rarely corresponds to a whole number or a number close to a whole number. There is no constant tendency for this ratio to increase or decrease. Rather it is found to fluctuate from one age group to another. This tendency has been observed in all countries compared, for both males and females. The general picture that emerges from this analysis is that the numbers of males aged 0-4 were deleted (except in Kuwait). Differences in the rates of advanced ages are considerable and difficult to account for.

A census is a multi-staged operation and the possibility of errors occurring somewhere varies in different stages. This largely depends on the efforts made in the stages of preparation, training and provision. Good planning for the census requires complete envisaging of the following: types of probable errors, impact of such errors on the results of the census if they remain valid, means of discovering errors and means of avoiding errors.

Avoiding errors is extremely important, as some kinds of errors may not be easily discovered. Mistakes in codification, for example, cannot all be discovered during the stage of classification. Similarly, during the stage of provision, systems analysis often neglects the tests of data coverage. This leads to the deletion of data on some individuals at the family level. Whole records, or even the records of a certain geographical region, etc., may be omitted. Such errors can be discovered only in the final stages of the provision process (Al-Najar, 1986).

Within the national arrangements for the next

census, the GCC countries took a number of measures¹ to help avoid obstacles impeding implementation, reduce errors in coverage and content and maximize benefits of the census.

In Kuwait, for instance, ready-made forms were used in the latest census to help enumerators fill in the correct answers using the appropriate codes. In Bahrain, the organizers of the census provided enumerators with detailed maps (with the numbers of administrative units marked on them after updating the maps three months before the census), as well as with lists of the names of heads of households and numbers of members of households.

Efficiency of the Registration System

The basic information in the vital-events forms is subject to errors in coverage and content just as is the case with census data. Giving approximate and inaccurate ages when reporting vital-events (especially the mother's age at birth or a person's age at death) is not uncommon. Errors may also be found in other data such as those related to sex, profession and marital status.

The degree of efficiency of the registration statistics in GCC countries is indicated by tracing the data in table 3, which shows changes in birth and mortality rates in the six GCC countries in the period 1976 to 1985.

In view of the relative similarity between the

¹ Such measures include formulation of specific definitions of the items included in the form, preparation of booklets for census workers, making census divisions, giving model replies for every type of form, compilation of categories of professions and activities reflecting the prevailing conditions in the region, drawing up a plan for the publication of tables in the light of the need to supply the data most needed, drawing up a publicity plan, etc.

Table 3. Crude birth and death rates registered in GCC countries, 1976-1985.
(Per thousand)

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Kuwait										
Crude Birth Rates	43.0	41.2	39.6	37.4	37.2	35.5	34.7	33.3	31.5	28.4
Crude Death Rates	4.3	4.7	4.0	3.9	3.6	3.2	3.2	2.8	2.5	2.4
Bahrain										
Crude Birth Rates	32.4	28.1	28.2	28.7	28.1	27.7	27.3	26.9	25.7	24.4
Crude Death Rates	3.6	3.0	3.3	3.3	3.2	3.1	3.0	2.7	3.1	2.7
Qatar										
Crude Birth Rates	27.8	28.0	29.9	28.8	29.3	30.0	30.9	29.5	29.7	30.7
Crude Death Rates	3.5	3.6	3.2	3.4	2.9	3.0	3.0	2.9	2.2	2.6
Saudi Arabia										
Crude Birth Rates	15.0	16.3	19.0	19.8	19.9	----	----	----	----	----
UAE ^{a/}										
Crude Birth Rates	18.3	19.9	26.8	----	----	----	----	21.8	----	----
Crude Death Rates	2.6	2.4	2.3	----	----	----	----	1.8	----	----
Oman										
Crude Birth Rates	----	----	----	----	29.3	29.4	33.6	34.3	33.3	33.3
Crude Death Rates	----	----	----	----	1.7	2.2	2.1	1.8	1.8	1.6

Source: Author's calculations based on data derived from vital registrations.

a/ Data relate to Abu Dhabi only.

---- Not available.

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economic and, to a certain extent, social conditions prevailing in all GCC countries, it is also expected that patterns of change in birth and death rates would be similar.

Birth rates vary in GCC countries, except in Kuwait and Bahrain where rates tend to fall gradually. They fluctuate in Qatar and tend to rise in Saudi Arabia and are relatively stable and high in Oman. Even in Kuwait and Bahrain there is clear disparity when the rates of nationals and non-nationals are compared. Differences in rates between GCC countries, which seem logical in Kuwait and unstable in other GCC countries, directly reflect defects in birth registration.

Although mortality rates are expected to fall, defects in registration are largely common in all GCC countries but are less evident in Kuwait.

Table 3 shows low death rates in all these countries that are gradually falling further. This can be partly attributed to the health care available in all GCC countries, the spread of means of preventing child diseases and the availability of protection against infectious diseases. However, the low rates can undoubtedly be partly attributed to incomplete registration.

To prove the presence of inaccurate statistics, several indirect methods were used in Bahrain to calculate birth and death rates from census data. The results of the study conducted by the Central Statistical Bureau in Bahrain (1987) show that inaccuracy in death registration was 71 per cent in 1971 when the vital statistics system was introduced, and dropped to 32 per cent in 1982.

If we presume that the registration degree decreases linearly, it is expected that the degree was 17 per cent in 1985. The Central Statistical Bureau attributes the fall to the increasing number of childbirths at hospitals, accounting for about 90

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per cent of the total births in the country. As for deaths, the degree of incomplete registration of Bahrain was 46.2 per cent in 1981.

Although no field study was conducted to measure incomplete registration in Kuwait, a comparison of the rates calculated, using the direct method for infant deaths and deaths of children aged 1-4 in 1980-1982, with those calculated using the indirect method on the basis of the 1980 census, shows a considerable degree of the coverage of child deaths in general (Kuwaitis and non-Kuwaitis). The coverage of infant deaths is very high for Kuwaitis. Incomplete registration for non-Kuwaitis is estimated to be about 15 per cent (Kuwait, Central Statistical Office, 1986).

In the light of the above statistics of the GCC countries, it is apparent that only Kuwait has an accurate vital registration. Moreover, statistical coverage in Kuwait is rather satisfactory, since there is a law binding all those concerned to notify the authorities of such events.

Problems of Planning and Applying Systems of Demographic Data Collection in GCC Countries

Census

Errors in data arising in the census are related to a number of problems emerging in each stage of the census. Some Arab Gulf countries have neglected to document in detail their experiences related to census-taking. There is rarely in Arab Gulf countries an analysis of the rates of performance in the various stages of the census or an analysis or assessment of budget items. Furthermore, in some cases, when planning for census-taking, comparison and analysis of data in the recent census against those in previous censuses may be neglected, despite the importance of this.

Vital Statistics

In general, the problems of census can be classified into three groups corresponding to the main stages of conducting a census:

a) Problems during the stage of planning and preparation. The most important of these are changeable geographical division of regions from one census to another, and different standard variables in each census;

b) Problems during field work. Such problems arise because of technical or administrative difficulties. Some of them are related to prevailing economic and social aspects, among them: named population, widespread illiteracy, lack of statistical awareness among people, multiplicity of nationalities and dialects, errors of registration and shortage of enumerators, and different methods of counting in the census;

c) Problems during the stage of finalizing data and preparing it for publication. These include the following: the long period needed to provide the data, lack of time balance between the census phases and the automated provision of data.

Following is a review of the causes and results of the problems preceding the census in GCC countries.

Changeable Geographical Division of Areas within the Country

Arab Gulf countries have various divisions of geographical areas including administrative, health and financial divisions. In addition, many roads have no designations and there is no constant system of addresses in most towns. This situation means that census planners have to divide up the country into statistical divisions appropriate for census-taking, and this involves numerous field operations.

In Kuwait, for instance, the country is divided into five provinces; each province is divided into communities called "city", "suburb" or "village".

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These communities vary in size making it difficult to use them as a basis for distributing work among census workers. Therefore, the principle of statistical division was adopted when carrying out the census. This involves the division of the country into several statistical areas, each of which is divided into one or more sectors. Each sector, in turn, is divided into one or more squares. Each square consists of a number of blocks. To define the location of each unit, plans were prepared showing the boundaries of each of the above divisions.

Although this method was successful in controlling the field operation, the numbering used for the census was temporary and would be difficult to use later because the geographical division of areas is not constant. For example, Bahrain was divided into 8 areas in 1971 and into 11 areas in the 1981 census. Different geographical divisions of the areas in Bahrain make comparison of population by geographical area extremely difficult (Al-Nasser, 1985).

Different Standard Variables in Each Census

The earliest censuses in Arab Gulf countries were organized for the purpose of collecting definite data on the population. In recent censuses the purposes varied: the results were used to draw up development plans. Censuses have become a source for much economic, social and demographic research, as well as a major source of information for all governmental departments, organizations and companies as well as any interested persons. The discovery of oil in the Gulf countries was accompanied by major economic and social development leading to the recruitment of a large Arab and Asian labour force and prompting officials in these countries to make use of the census data in following up and identifying the development taking place.

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The questionnaires in Gulf censuses contain many variables in compliance with most international recommendations on the quality and quantity of the required data and forms of tabulations prepared to obtain facts. The variables included in each census keep increasing in comparison with the preceding census. For instance, international principles and recommendations on censuses contain, as regards the information to be filled in the census questionnaire three special lists termed "A", "B", and "C". These lists are arranged by priority: List "A" contains those items stressed at the meetings of regional economic commissions and considered essential and which were considered top priority among the items listed in the census questionnaire. List "B" contains items recommended as being useful, while the remaining items are grouped in List "C".

Three Gulf countries, namely Kuwait, Bahrain and United Arab Emirates, included in their most recent censuses the majority of the items recommended in List A and B (Al-Halak, 1985). Each of the three countries included 56 per cent of the topics and 61 per cent of the total items recommended in List A. The remaining items in the two lists were included by one or two of the three countries with only a small number of items neglected by one of them. In addition, certain items in the census questionnaire were not included in the lists of recommended items, such as "duration of practicing of profession" in Kuwaiti and United Arab Emirates censuses, and "number of marriages" and "period of residence" for foreigners in Kuwaiti and Bahraini censuses.

In brief, concern by GCC countries to follow international recommendations on census items as well as coverage and variation of questionnaire items from one census to the next makes comparison of recent censuses with earlier censuses a complex process subject to errors and limits.

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Marginal Nomad Population

Census-taking requires that the population be stationary at the time of the census. However, a small proportion of the population in Gulf countries consists of nomadic bedouins, people living in neutral zones between two countries and people who happen to be in territorial waters on the enumeration night.

Nomadic tribes in some Gulf countries are the main population problem in census-taking. Marriages and divorces are based on traditions and conventions that make it impossible to interview married women and enquire directly from them about children born alive and surviving children; fertility data are therefore inaccurate. Although working out a special questionnaire containing a limited number of questions is one of the proposed solutions, the remaining issue concerns coverage (over-enumeration and under-counting) of nomadic populations, especially if they move extensively during the census period.

Widespread Illiteracy and Lack of Statistical Awareness

The illiteracy rate is high among the people of the Arab Gulf countries. It is higher among females than males and is higher among national than non-national residents. United Nations estimates for 1986 show that the illiteracy rate among males (15 years and over) is 18 per cent in Bahrain, 21.3 per cent in Kuwait, 25.5 per cent in the United Arab Emirates and 28.8 per cent in Qatar. As for females, the illiteracy rate was 36.5 per cent in Bahrain, 30.4 per cent in Kuwait, 31.7 per cent in the United Arab Emirates and 30.6 per cent in Qatar. The rate is even higher in Saudi Arabia: 30.3 per cent among males and 64.9 per cent among females. The highest rate of illiteracy was in Oman, where two thirds of males and almost all females aged 15 and over are illiterate (United Nations, ESCWA,

1987b).

Naturally, the high illiteracy rate affects the census data, especially if it is taken into account that illiterate persons find it difficult to respond to some of the items in the questionnaire, such as "profession", "economic activity", etc. In addition, the questionnaire usually contains items which the enumerator cannot explain accurately during data collection, such as the number of live births and survivors. There is further difficulty when answering questions involving giving information such as duration of residence, marriage and practice of a profession.

Added to this is the weak statistical awareness among many people. Notwithstanding educational status, some people may refuse to answer or may provide wrong information for fear of arousing envy or for fear that some harm may come to them if such information becomes available; likewise, they may give wrong information in the hope of reaping personal benefits if such data are linked to some laws or government measures.

Multiplicity of Nationalities and Dialects

(Kuwait, CSO, 1987) Between 1975 and 1980, the number of non-nationals in GCC countries is estimated to have increased from 2 million to 4.2 million; the non-national labour force rose from 37 per cent to 57 per cent of the total labour force during the same period. The proportion of migrant workers is quite high in some economic sectors and is becoming highly concentrated in other sectors.

The 1986 data for Saudi Arabia shows that the proportion of expatriates was the lowest, constituting 22.8 per cent of the total population and was the highest in the United Arab Emirates (74 per cent). It was 32.1 per cent in Bahrain, 37.3 per cent in Oman, 58.8 per cent in Kuwait and 73 per cent in Qatar. Furthermore, the proportion of non-

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nationals in the total labour force rose to high levels and had doubled within five years in some of them (United Nations, ESCWA, 1987).

Arab countries were the main source of labour force until the early 1970s. Then recruitment of non-Arab Asian employees began, becoming more common in the mid-1970s in Kuwait and Saudi Arabia. The proportion of Asians in Saudi Arabia rose from 6 per cent in 1975 to 16 per cent in 1980, and from 18 per cent to 34 per cent in Kuwait during the same period. In the other GCC countries (the United Arab Emirates, Bahrain, Oman, and Qatar), the Asian labour force constituted three quarters of the total foreign labour force. The proportion in Oman rose to 83 per cent (Bahrain, Central Statistical Bureau, 1987). The most important change since 1975 has been the rising proportion of the labour force from south and east Asia, especially from the Philippines, South Korea and Sri Lanka, as well as from Indonesia and Thailand, to a lesser extent (Sirageldin et al., 1980).

Multiplicity of languages and cultures has led to the spread of schools serving foreign communities including Arabs, Americans, Pakistanis, Armenians, Indians, Iranians, French and Japanese in countries such as Kuwait. There are radio and television programmes as well as newspapers and sections of national newspapers in different languages in most of the other GCC countries (Kona, 1985). In view of such multiplicity, difficulties were bound to emerge during the data-collection phase. Kuwait was able to deal partially with this problem before the start of the process. The non-Arabic speaking individuals were identified and a questionnaire in English was prepared for them to complete. In addition, a large number of enumerators who are proficient in English were trained for this purpose. Furthermore, the nationals of foreign embassies were requested to complete the questionnaires with the assistance of the embassy translators. The problem of different Arabic dialects was solved because most of the

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enumerators were nationals of Arab countries working as teachers in Kuwaiti schools.

Registration Errors and Shortage of Enumerators

Registration errors could be attributed to enumerators and respondents. In both cases the error may either be incidental or intentional. In some cases the enumerator may obtain information on the family from a young member of the family or from a servant, because customs and traditions prevailing in Gulf countries do not allow enumerators to enter houses and verify certificates such as those related to nationality, marriage and divorce as well as academic and birth certificates, etc. In Bahrain, although it was necessary to produce the passport at the time of counting, many residents failed to do so.

In Kuwait, repeat visits were made as needed to the household to allow enumerators to meet as many adult members of the household as possible. Furthermore, female enumerators were recruited to make it possible to enter the house and obtain more accurate information on the dates of marriage and on fertility and motherhood. Such solutions were not possible in other Gulf countries either because it was impossible to recruit a sufficient number of trained female enumerators, as was the case in Bahrain, or because of the restrictions on women's employment, as was the case in Saudi Arabia (Al-Khodari, 1976).

All Gulf countries face the problem of providing trained enumerators. The typical Gulf family is a large one, and the census questionnaire contains a large number of questions, which require a long time to answer. Consequently, a large number of enumerators are needed. The problem is even more difficult if the country is as large as Saudi Arabia.

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To solve the problem of shortage of enumerators, some Gulf countries, such as Kuwait, recruit enumerators working outside office hours. In Bahrain the local authorities had to recruit students, security men and local civil servants, which negatively affects the accuracy of the census data.

As regards technical cooperation in census-taking, only one country, namely Kuwait, depended on locally available expertise, while other Gulf countries employed foreign expertise in this field. The countries vary as regards the phase of the census in which foreign expertise was employed. For instance, while Bahrain used such expertise in the phases of planning/preparation and tabulation/publication, the United Arab Emirates restricted this to the phase of planning/preparation only.

Different Methods of Counting in the Census

Arab Gulf countries adopt the de facto census, in which people are counted according to the place where they are found at the time of enumeration, regardless of whether they are nationals or happen to be in the country at the time of enumeration.

However, some exceptions to this method are made according to the population situation in each country. In Kuwait, for instance, Kuwaiti diplomats and Kuwaitis whose work required permanent residence abroad as well as all members of Kuwaiti families who temporarily lived abroad, such as students, businessmen and those who travel abroad for treatment, tourism, etc., were included in the census. In the United Arab Emirates, all nationals who were abroad at the time of the census were counted with their families regardless of the duration of their absence. In Bahrain, although the de facto method was used in the 1941 and 1951 censuses, the theoretical method was used in the next three censuses. In the most recent census, both methods were used. In certain cases, such as

those of foreigners in transit at airports and ports as well as those residing at hotels and other places of accommodation, they were counted on the basis of the places where they were found. The rest of the population was counted according to the date of their regular residence.

The Period Needed for Data Processing

The Statistics Division at ESCWA conducted a study on sources of population statistics, the first questionnaire of which dealt with population and housing censuses and consisted of 47 questions. One of the questions was on the period needed to process data. Answers from three GCC countries showed that the period was 11 months in Bahrain, 15 months in the United Arab Emirates and 18 months in Kuwait (Al-Halak, 1985). While the above figures reflect considerable variation in the period of provision among the three countries, they also show the long period needed by the automated processing of the data.

In reviewing the time periods needed by individual countries to provide the results of censuses, the participants in the Regional Seminar on Population and Housing Censuses in Western Asia found that the delay was due to several causes, some unique to certain countries, some common causes. Some of the delay was due to the lack of available resources, quantitative and qualitative, to provide the data as required by the tabulation programme drawn up by statisticians.¹

Lack of Coordination between the Census Phases and Automated Data Processing (ADP)

Census-taking consists of several phases, starting with drawing up a detailed plan for each

¹ *On avoiding such delay in future censuses, see the recommendations of the Seminar (United Nations, ESCWA, 1986).*

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phase consisting of the steps and details of technical work and all financial, human and technical requirements, as well as scheduling the various steps for each phase.

The issue of scheduling the statistical work and the data processing begins with the initial decision to conduct the census. This is because automated data processing requires a great deal of preparation; the volume of work to be done by the computer must be estimated. The equipment and human resources needed must be planned, and this may require importing equipment or sending technicians abroad for training or recruiting experts in this field. Delay in providing inputs for ADP would create administrative problems. In addition, lack of harmony between the questions included by statisticians in the census, the means suggested to test such harmony, and the required volume of work needed to provide the data could eventually cause unnecessary delay. The extra questions to be included in the census questionnaire may seem useful in making it unnecessary to conduct a specialized survey; more tables obtained from data collection would help throw light on numerous phenomena. However, any additions in the scope of the questionnaire will require extra resources to conduct the census, and this would certainly disrupt the schedule between the phases of counting and automated data provision.

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The differences in problems facing registration statistics in GCC countries is natural in view of the varying legislation and continued updating of the system of data collection, verification, classification and analysis in different countries. In addition, variation in population distribution in each of these countries in urban, rural and desert areas affects the coverage and accuracy of data. Availability of human resources is an important factor for the completion of these statistics.

Notwithstanding this variation all or some of the problems listed below prevail in varying degrees in GCC countries:

Under-enumeration

The degree of coverage varies from one region to another. Under-enumeration is at its lowest level in cities and areas close to them. It increases in rural areas and is at its highest level in the regions farthest from urban areas. Under-enumeration is faced by all countries which are statistically backward. Identifying the extent of under-enumeration is certainly necessary for determining the accuracy of vital statistics. To achieve this, countries resort to a set of direct and indirect criteria. Among the numerous factors affecting to various degrees the completeness of enumeration are the following: (a) inadequate legislation; (b) insufficient coverage of all regions of the country by the relevant registration office; (c) spread of certain traditions which are opposed to enumeration, especially in remote areas; and (d) lack of incentives for citizens to report.

Data Tabulation

This problem arises essentially because births may be tabulated according to actual birth date or according to date of registration; they may also be tabulated according to the regular place residence or to the place of birth.¹ The importance of the first case is in the countries whose laws allow for a long period for completing the registration process. The importance of the second case is illustrated in the geographical areas where maternity hospitals are found. These, of course, are urban areas where the registration of

¹ For criteria used by some countries to consider still births as abortion cases see Helmi, 1970.

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information on the basis of location of the event leads to a decrease in the estimated birth rates and an increase in the estimated infant death rates in rural or desert areas, because some of the births in these areas are registered with births in urban areas.

Inaccurate Organization of the Enumeration Process

Following are the prevailing problems:

1. Inadequacy of most of the forms used and shortage of personnel trained in their use. Kuwait was aware of the problem of lack of technical personnel in the vital statistics system. The Ministry of Public Health, therefore, in cooperation with the General Establishment of Applied Education and Training, held specialized training courses in the field of biostatistics and health statistics; the graduates would work at statistical departments in hospitals and registration centres in Kuwait.
2. Lack of clarity regarding the cause of death in some sample forms for the registration of deaths.¹ For instance, death certificates in Kuwait formerly included the following: direct cause, the case from which the direct cause has arisen, and the case leading to death.

This categorization, however, did not meet the desired objective of the World Health Organization for statistically classifying the cause of death. The case from which the direct cause arise and the case leading to death caused misunderstanding on the part of physicians completing death certificates. The amendment introduced by Kuwait to the cause of death listed in the death certificate involves classifying the cause according to the age of the deceased: first, deaths of children aged less than a week, and second, deaths of children aged one week

¹ See *Registration of Births and Deaths in Kuwait*. (Kuwait, Ministry of Public Health, 1986).

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and over.

3. Confusion in cases where there is suspicion that the death was the result of a crime, and writing two death certificates for the same person. Kuwait overcame this problem by instructing the forensic medicine department to issue death certificates in the cases referred to it by using a new form designed for this purpose. The form is then completed by both the physician who requests the autopsy and the investigating authority.

4. No link between death notification and birth notification. Kuwait added some information to notification forms, such as the civil number, registration data and registration and verification in the central register.

One of the reasons for the problem of different definitions is that the register of vital statistics, which is considered responsible for maintaining uniform criteria in classification, obtains most of its data from persons not directly related to the events being reported. Deaths, for instance, are reported by a person who may not have any interest for giving accurate information.

In addition to the above major obstacles faced by the vital statistics system in general, there are other problems including the following: multiple notification and model forms, non-use of the available technical resources, ineffective equipment as well as inefficient maintenance and operation services, organizational problems impeding the extraction of data from records, registration of events in huge records which are very difficult to handle, registration of secondary data and omission of other more important data (which reduces the value of the registered data in general), lack of public information, and lack of trust in the confidentiality of the information on individuals, and lack of instruction booklets, as well as complete absence on documentation of the system applied, and inadequate financial resources to improve the system.

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Household Surveys

There are three common types of household surveys: retrospective surveys, double-entry systems and follow-up surveys.

Retrospective Surveys

These usually contain a limited number of what can be called retrospective questions. These surveys aim at identifying vital events during a specific period in the past, normally the previous 12 or 24 months. Retrospective surveys are subject to three groups of errors: omission errors, misinterpretation of the observation period and errors in giving birth dates according to age of mother. Errors of omission are quite clear for births occurring in the distant past. Good field work may help reduce such errors, but complete eradication is impossible. Errors in the observation period occur when births listed as occurring in a specific year do not actually belong to the births in that year but rather to a larger period. Error arising from giving the birth dates occurring a long time ago according to mothers' ages may be attributed to some researcher's, tendency to believe that all women married at early ages and delivered their babies at an early age. Elderly women tend to exaggerate the dates of delivery, giving earlier dates. The Brass methods (Brass, 1971) are an important reference in demographic analysis for measuring and eradicating these errors.

Double-Entry System

This type of research is conducted by using two separate methods to collect information on vital events for a specific period in a given community; the data collected by one method are then compared

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with those collected by the other method.¹ In practice, a number of countries, including India, Pakistan, Turkey, Korea and Thailand, have used this method to estimate their rates of vital events. The research was conducted and the first source used was a civil or special register; the second source was a one-stage household survey or a household survey based on several visits.

This method is subject to two sets of problems. One arises during data collection, the second during matching. The problems faced when the first method is used are due to the difficulty in distinguishing between the time of the event and time of registration or between the place of registration and place of residence. The errors arising in such cases can be avoided by shortening the reporting period (since this would help the family to remember the vital event), repeating the visit to the same household several times, and recording the change in the composition of the family between one visit and the next.

Shortening the reporting period, however, means that there will be a small number of vital events recorded for the families in the sample, leading to increased variation in the estimated rates. To reduce such variation, the size of the sample could be increased, but this, of course, would lead to higher costs. Repetition of visits to the same family may involve increased bias arising from association, and taking one of two forms: a positive reaction, prompting families which are visited to more accurately report vital events better than families outside the sample, or a negative reaction, making the families or researcher refrain from reporting the events in the family because of

¹ The study presented by Chandrasekran and Deming, 1949, entitled "A Method to Estimate Birth and Death Rates and Registration Level" is considered one of the first theoretical studies on this subject.

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boredom with repeat visits.

The second set of problems, arising during the matching process, are related to the following cases: (a) Probable and improbable correspondence cases. These cases are identified during the correspondence process on the basis of evidence such as recent date of the event within the period of the research or proximity of the family's geographical location to the area of research and not stating the date of the vital event or its overlapping with the dates related to other members of the family;

(b) Cases registered outside the area and time of the research. For instance, in some Gulf families the woman may give birth to her child at her parents' house and register the child at its birthplace. However, when visited she provides information at the family's present place of residence, which may differ from the child's place of registration. When the research lists are matched with the register list, they do not correspond;

(c) Cases of false and true correspondence. The former arise when the two lists include two different events counted as a case of correspondence as a result of using inadequate evidence. Cases of true correspondence arise when the two lists indicate an event which is not considered a case of correspondence as a result of an error in the registration of the data used as evidence in support of correspondence.

By their nature, vital events are relatively rare, and therefore a large number of visits to the household would have to be made to register a small number of events. Therefore, household surveys involving multiple visits¹ always give better

¹ Household surveys, either involving one or multiple visits, were not completely successful in obtaining error-free death statistics. See Mauldin, 1966; Brass, 1971.

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results than household surveys involving one visit. Such surveys make it possible to provide regular information on changes in family size and structure and reasons for such change, to apply the overlapping periods method for registering vital events and to identify, in advance, possible changes in the household, which assist the accuracy of registration.

Studies indicate that single-phase household surveys are inadequate because they cannot cover events such as early infant deaths, illegitimate births and deaths in single-parent families. Such events are more liable to omission errors than are other events. In Lunde's discussion (Lunde, 1976) of the limitedness of single-cycle surveys, he pointed out that data on death in a number of African countries (Uganda, Niger, Tanzania and Algeria) have never been published because of the defects in the data collected from single visits.

Follow-up Surveys

The follow-up method first evolved in medical statistics. When applied in population statistics, observation surveying was used because of the high costs compared to effectiveness and because of better registration of the migration movement.

In follow-up surveys, surveys with continuous character have started to replace separate surveys. There are different types of continuous surveys. The survey may be linked to one fixed or changeable item, and the survey sample may be fixed or changeable (wholly or partially) in terms of time. In modern applications, follow-up cycles are controlled by a system of random checking in the form of double visits made by independent researchers to a subsample of the household. The two registers are then compared, and correction factors are obtained.

The follow-up method minimizes errors of memory

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and almost eradicates what is called the actual effect of uncertain dates. Furthermore, this method overcomes two major obstacles in the dual source system. The first obstacle concerns cases beyond the scope of temporal or geographical research. An error leads to non-correspondence between the numerator and denominator of the fraction in the vital rate. In the follow-up method the source is the same document, and thus, correspondence does exist. The second obstacle concerns the well-known problem of comparison. In the follow-up method, the two forms compared with each other depend on the same former register, and thus there is almost no doubt in the identity.

Towards a Strategy for Population Data Collection in GCC Countries

To stress the importance of population data of each country in the region does not deny the considerable variation in these countries, vis-a-vis the sources necessary to meet their need for such data. For example, Kuwait has acquired considerable experience in census taking and has also made good progress as regards other population sources; the other GCC countries have improved census-taking and have not given other sources similar emphasis, because they consider the census the backbone of demographic data in any country.

There is no fixed strategy which can be followed in every country in the region. However, approaches can be adopted that are in line with national needs and resources and which allow for comparison with other countries. The first step in this direction takes place by unifying the concepts, classifications and definitions as well as the tabulations used in the statistics. There should also be further cooperation among the countries of the region and active exchange of experience and information among them.

The initial step towards a balanced policy on

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data collection at the national level starts with evaluating available resources and defining the role of each of them as well as the extent to which each resource can meet the objectives and priorities of this policy. The design of any information system should be evolutionary in its structure and capable of meeting new needs as they arise and of using modern resources and available facilities.

To draw up an optimal policy for data collection or to improve such policy, each country starts by compiling a list of the items for which data should be collected. This list should develop into a set of realistic objectives that meet the country's information needs. Priorities and degrees of preference and accuracy should come into play during this phase of defining objectives. For instance, for each item of information, Kannisto (1979) refers to several points related to the priority given to the item, time rate, basic degree of preference for requesting the datum, degree of geographical preference for tabulation and, finally, the desired degree of accuracy (when using the observation method). After the set of objectives has been approved, work can start in the four sources of population data. Naturally, the role of each of these sources will vary when proposing a data-collection policy, depending on a number of factors, including the following: the size of the population and the amount of information available about it, the prevailing political system as well as the customs and traditions, the available material and human resources, and the existing statistical organization and the degree of sophistication of the statistical organization that is responsible for collecting population data.

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Drafting a General Policy in the Light of the Results of Analysis of the Current Situation in GCC Countries

Population Census

Objectives can be formulated so that countries without an advanced capability in data collection can immediately organize census taking. The decision to conduct the census should be accompanied by a well-defined programme which can be implemented with all local and national organs within the participating country, and in cooperation with international organizations. In the early stages of the census the following measures should be taken:

(a) Establishing a central statistical department as a complementary part of the data collection system in the country, to be continuously responsible for all phases of the census and for securing the safety of the six bases needed to conduct the census: timeliness, individuality, coverage, geographical scope, publication and periodicity;

(b) Preparing maps, defining counting areas, and establishing a geographical framework needed not only for enumeration operations but also for use as a basis for distance counting;

(c) Using a questionnaire to facilitate enumeration and shorten the classification period;

(d) Conducting an investigative study to test and improve the proposed enumeration process. Such a study should be conducted in various places in the country, each place covering at least 50 families; it is not recommended to conduct this on a sampling basis.

There are two methods of counting. The first consists of a simple enumeration of the population with specific information; the second consists of this, and in addition, a sample related to the census and to specific information within the scope of international recommendations. Applying this method makes it possible to control numerous

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problems in countries facing a shortage of trained personnel. Satisfactory information related to past events can be obtained, such as live births, as well as deaths, up to one year prior to the census taking.

A review of the strategy in the remaining Gulf countries which have conducted one or more censuses shows that it is not necessary that the countries take the census in the same years as each other; rather, the important thing is that they be conducted on a continuous and comparable basis. In the light of the problems mentioned above it is necessary for these countries to conduct a pre-test of the census form and a post-enumeration survey to evaluate the results. The strategy also involves conducting a sample enumeration between each two comprehensive censuses. Gulf societies are static communities in which it is important to follow up successive changes in the size, composition and distribution of the population.

The items recommended to be included in the census questionnaire were discussed by the participants in the Regional Seminar on Population and Housing Censuses in Western Asia. The purpose was to reach an agreement on the basic items recommended for inclusion in population and housing censuses in the 1990s. The consensus of opinion was to leave this issue to the country concerned in order to identify these items according to its need for data on the one hand and its various resources on the other.

Civil Registration

By a civil registration system is meant the procedural elements constituting the registration system as a whole. The elements include, in legal terms, the procedures related to the registration of vital events, prenatal deaths, marriage and divorce and the issuing of certificates to this effect, dealing with cases of unregistered events, amendment

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of registration data, and other measures of a legal character. Statistically, these elements also include the collection, classification and analysis of data as well as publication of results of using the data.

The question now concerns the policy to be adopted in order to obtain a good system of a civil register.¹ The strategy for the countries whose conditions allow the establishment and implementation of the system stresses the evolution of the basic elements needed to strengthen this system. These include the following:

(a) Establishing laws obliging those concerned to report vital events;

(b) Agreeing on definitions and standardizing indicators;

(c) Improving the documentation sequence of reporting vital events through the following: defining responsibilities and functions of each group in the documentation sequence of reporting vital events; making an inventory of the equipment needed; overcoming organizational and administrative problems impeding the documentation sequence of reporting; reducing the size of records used to register vital statistics; and setting up a system to control and follow up registration at the area and health-centre levels;

(d) Improving reports on vital events and the data they contain;

(e) Coordinating work of various governmental sectors concerned with the registration of births and deaths, especially the health, planning, interior, justice and statistics sectors;

¹ Experts of the International Institute for Biostatistics suggest three basic elements for the development of civil registration in Asian countries, namely drawing up a reform plan at the national level, defining the problems impeding the improvement of registration, and finally mobilizing the available resources at various governmental levels to conduct the necessary activities according to an integrated reform plan (IIVRS, 1986).

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(f) Promoting statistical awareness among the general population and health workers to stress the importance of participation and responsibility in consolidating the systems of birth and mortality registration;

(g) Using practical systems for data processing which guarantee speedy retrieval of the necessary information;

(h) Developing human resources employed in the system through a long-term plan at all levels;

(i) Documenting the registration system through preparing pamphlets for the general public explaining the legal provisions of the system as well as the kinds of documents, their circulation and types and means of data collection.

Basing the registration system on sound principles helps secure a full flow of vital registration from internal areas to a permanent store to serve legal purposes and also provides a database along a time series assisting in studying the general direction of various demographic aspects. Such internal consistency is one of the main characteristics of the registration system. Because most definitions conform to international recommendations, it is possible to compare registration data with those from other countries. On the other hand, registration of data on a permanent basis helps to avoid periodic surveys with high costs and the accompanying changes in objectives, methods and definitions.

As has already been stated, the defects of registration are relatively few. Yet, incomplete registration is the main problem in most countries. Furthermore, the registration system is generally inflexible when there is a desire to make amendments.

In the countries that lack a good civil registration system, it would be better to use the sample registration system as an alternative to a comprehensive registration system for the purpose of

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data collection to assess the demographic situation. Under certain conditions sampling can be even more accurate than comprehensive registration. The small size of the sample may help introduce controls which make up for the lack of motivation on the part of the population being registered.

Establishing and developing a civil registration system at the national level is not easy, probably because the achievements accompanying civil registration in the past few years have not quite kept up with the achievements accompanying family surveys and indirect methods of assessment. There are solvable and unsolvable problems according to the stages of economic and social development in a country. Linder (1981) suggests that instead of dealing with all the problems together, some can be postponed to later phases. In this context, one method to improve registration is to use the principle of expanding registration areas. This method is based on starting up registration in a selected area and then gradually extending registration to other areas until the whole country is covered.¹ The first area is usually selected in a city or in another area in which such an operation can be initiated and supervised, since it is more readily accepted by the population there, while rural areas are left until later. The problem with this method is that, as long as it does not cover all parts of the country, the registration area does not represent the whole population.

Naturally, it takes a long time to work out a good registration system, which means that steps should be taken immediately to initiate and gradually develop such systems by applying the

¹ *In the USA, the mortality registration area method was introduced in 1900 in 10 out of 48 states, in addition to the District of Columbia. This method was not applied to the whole population until 1933. See Moriyama, 1982.*

principle of expanding registration area, perhaps using the capital as a starting point. It is preferable in the early stages not to register still births; likewise, registration of the cause of death should be limited to those cases for which the physician has issued a death certificate. Until civil registration is complete, then death rates, levels and patterns should be estimated by indirect methods.¹ To use such methods we can obtain the necessary data from the census or surveying research; it is preferable to do this on consecutive surveys.

Sampling Surveys

Sampling surveys are among the most important and least costly sources of population data. They vary in terms of size, design and objectives. The purpose of sampling surveys may be to complete the census by collecting data in the years between two censuses. Indeed, censuses and household surveys are not substitutes for another; rather, they complement and serve each other. The family survey may be a single survey or may be repeated, with data being collected in separate cycles, called survey rounds, conducted at regular intervals. On the other hand, the family survey may be specialized if it is limited to one item. In others, the search consists of several items. In both cases the survey can be conducted in one or more rounds. However, in connected research at least one part of the research remains unchanged from one round to another, with questions on other matters changing from one round to another.

In the light of what has been stated, the

¹ *These methods provide acceptable estimates for specific purposes. However, the credibility of such estimates remains linked to the hypotheses used for estimation. In certain cases these hypotheses are not valid, while in other cases it is difficult to judge their validity. See Preston et al., 1978.*

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statistical department in a given country can complete the population database by designing an integrated programme of household surveys consisting of several separate surveys or of one survey with several items and rounds. Yet it is not easy at all to group all the items of family surveys in a single survey with multiple phases.

The target units in family surveys usually consist of primary units such as individuals or families. Because of the nature of the study, some population groups may be excluded from the survey, because they are beyond its temporal or spatial scope, or for some other reason, such as the desire to reduce cost. Sampling units in household surveys may themselves be the primary units in the target community or may differ from them. In the case of difference rules for enumeration linkage should be made so as to connect two types of units. Most of the linkage rules are separate and each one is linked to a single surveying unit.

Because of the costs involved, it is preferable to use the multi-phased surveying method whereby surveying is limited in each phase after the first one to the surveying units already chosen in the previous phase. This method allows the needed surveying units to be geographically closer instead of being scattered over the whole area of the target community.

For multi-phased surveying, it is necessary to prepare several frameworks for the various surveying stages. For instance, the surveying framework for the first phase usually consists of a list of the enumeration zones covering the whole target community, as well as a framework for secondary surveying especially prepared for the next phases. In statistical terms the surveying framework for the first stage is called the principal frame if it is used to select independent samples from various surveys, or if it is used in different rounds of a single connected or periodic survey.

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Since there is a main framework there is also a main sample, i.e., the sample from which partial samples can be selected to serve the needs of more than one periodic survey or round of a continuous survey. In both patterns, the process of choosing partial samples is either completely independent, or aims at achieving a certain proportion of overlap with the main sample.

Most literature dealing with the design of family surveys, both theoretically and practically, is concerned with the problem of the optional design in the case of a single survey (Kish, 1965; Yates, 1949). Later the importance of planning a continued programme of surveys emerged instead of conducting several separate surveys for several reasons, especially considering the high cost of preparing and maintaining surveying frameworks for separate surveys. Besides, using a main sample allows the reduction of the sample cost accompanying each survey. Despite its advantages, the design of the family programme is a difficult task whose success cannot be guaranteed under the demographic conditions prevailing in GCC countries. In practice, the typical procedure for obtaining a sample in separate surveys or in sequences of a continued programme requires the following steps:¹ taking a census and using the data obtained therefrom to prepare the framework of a major observation; selecting surveying units from this framework; selecting partial samples from the main sample; preparing a secondary observation framework for the main chosen observation units; and selecting samples of any survey from secondary observation samples.

In Saudi Arabia the main sample was designed for use in the multi-purpose family survey for a

¹ For a detailed study of this subject see United Nations, Statistical Office, 1987.

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five-year period. In the first year, four of the eight panels in the sample were inserted, and in each following year one of the four panels from the previous year was replaced by a new panel. The sample consisted of 300 pieces in 21 elementary observation units; lists of households per piece were compiled, and a random plan was used to allocate each household in the pieces of the sample to one of the eight panels.

Population Registration

The final source in the systems for collecting population data (a source related to the permanent registration of population) is the population register, which can be defined as a data collection system containing information on the entire resident and non-resident population of a country. Information is continuously updated through registration of vital events including births, deaths, marriages, divorces and so forth, in addition to changes in the place of residence.

It can be said, in general, that the experiment with population registers has been useful in GCC countries, especially Kuwait. The adequacy of the permanent population register depends on the adequacy of the sources providing it with information; the under-registration of vital events or population movements reduces the usefulness of population registers.

When population registers are completed, the system can then be considered a data bank, its output depending on official institutions, with less reliance on the information provided by individuals in the population. This can only be achieved through advanced technology and statistical awareness of the importance of registration.

Proposed Model for a Demographic Database

The Need for a Database

The programme for the International Census of Population and Housing for the 1980s (1975-1984) was set up to implement a resolution by the United Nations Economic and Social Council. Through this programme it was possible to identify six technical and administrative topics, especially methods of population data collection.

This subject was stressed in the attempt to make use of administrative population registration, which, if conditions permit, could be used as an alternative to the census. The United Nations Statistical Committee discussed this topic in the report prepared by the General Secretariat. The Committee stressed the importance of population data obtained by using such registration (United Nations, ESCWA, 1985).

Within this context, the present study will suggest a model of a demographic database according to the major technical developments in equipment or in programming providing considerable resources in the field of information operation, storage and retrieval.

Design of a Database

The system development life cycle of a database computer system consists of the following six main phases: design of the database, development of the database system, conversion of data from manual files to database files, the database system implementation phase through which the integrity of the database uses and contents is tested, the operations and evaluation phase through which the database system becomes operational and finally the database system maintenance.

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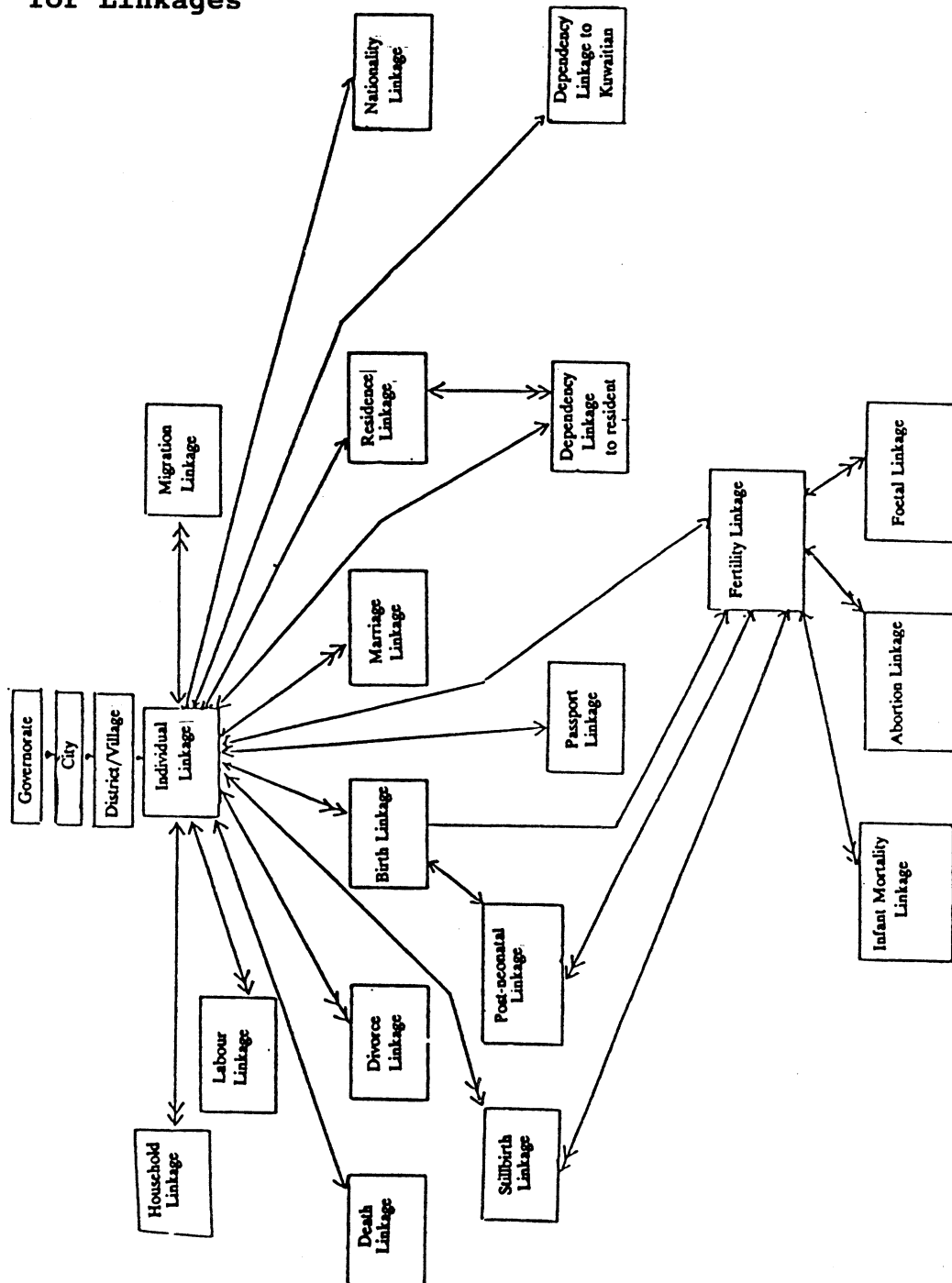
In practice, these phases overlap and are rarely separate. Besides, each phase consists of a number of tasks and activities. The first phase (design of the database) usually starts by analysing the requirements and needs of the end-user from a conceptual point of view. The end user retrieves the database information and uses it in his decision making. He is responsible for maintaining the data sources and keeping the data that is stored in the database up-to-date. When starting to design a database, there should be an inventory of all possible sources of data regardless of the use of all or any part of the data in the early stages of establishing the database. This stage usually makes it possible to identify the types of data and the extent to which they are related to each other as well as to spot redundant data and discover vagueness or lack of harmony between data sets.

In Kuwait the data set needed to design a database covers all the variables that can be obtained from the following documents: census data, notification of a live birth, notification of a still birth, notification of a death, marriage certificates, divorce certificates, and the individual's form in the population register.

By using the data available in the above documents, an integrated database can be prepared. Such a database contains 19 relationships concerned with the following: nationality, citizenship of the Kuwaiti, residency, citizenship of the resident, passport, marriage, divorce, birth, live birth, birth (still birth), death within less than a week, fertility, residence, migration, work, and geographical distribution (province, city, suburb/village). The figure shows the conceptual design of the above relationships, which are of two types:

- (a) One-to-one relationship, i.e., relationship between nationality and the individual;
- (b) One-to-many relationship, i.e., relationship between work and the individual;

Conceptual Frame for the Establishment of Database for Linkages



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SPATIAL DIFFUSION OF THE POPULATION OF AL-JAZIRAH REGION IN IRAQ

Abbas F. Al-Sa'adi

Introduction

Variation in population from one place to another is of considerable importance. The extent of such variation depends on consumption on the one hand and availability of labour on the other. Land and population are two interacting variables, and the distribution of population varies from one location to another depending on the extent of such interaction and the extent of peoples, participation in utilizing the resources of land, including agricultural utilization.

Variation in the size of population and its capabilities and resources clearly shows man's direct and indirect effect on production, because such variation reflects differences in the labour force and in the consumption patterns. Densely populated areas often have a large labour force and consumer market, contrary to sparsely-populated areas.

In the region under study, population diffusion varies from one place to another. The aim of this study is to illustrate the picture of the spatial diffusion of the population in Al-Jazirah in the north-west of Iraq between the Tigris and Euphrates and the Iraqi-Syrian borders north of latitude 34.5 degrees north (Wali, 1979, p. 25). The study excludes the extremities of the region near the two rivers. It thus consists of nine cadastral units covering the qadhas (districts) of Telafar, Sinjar, Hatra, Al-Ba'aj and Al-Mhalabiya nahia (subdistrict).

This study discusses the variables affecting population diffusion and provides accurate data at the lowest administrative level (the nahiya). Such data were used in the study because each nahiya has its own particular conditions governing the types of

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variations. The region was studied in the light of the 1977 census and compared with the data of the 1987 census to determine the extent of change in population diffusion during the period between the two censuses.

Methodology

The essence of geographical study is to identify the spatial relations of the phenomena on the surface of the earth. Such phenomena are not found in isolation, but there must be other phenomena related to them spatially. Variation of population cannot be attributed to one factor, but rather to several geographical factors (physical and human). The variation of these factors as a whole affects population growth from one location to another. Accordingly, it can be hypothesized that population diffusion and variation from one place to another in Al-Jazirah are related to the different physical and human geographical factors from one area to another. Since this general hypothesis cannot be directly measured, an attempt will be made to measure it through secondary hypotheses, each explaining part of the problem of the study and constituting together a solution to it. Following are the hypotheses:

1. Variation of population diffusion from one place to another depends on the variation of the total area of each cadastral unit in Al-Jazirah.
2. Variation of population diffusion from one place to another depends on the area of arable land in each cadastral unit in Al-Jazirah.
3. Variation of population diffusion from one place to another depends on the variation of the area of land planted with wheat and barley in each cadastral unit in Al-Jazirah.
4. Variation of population diffusion from one place to another depends on the variation in areas

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irrigated by wells per each cadastral unit in Al-Jazirah.

5. Variation of population diffusion from one place to another depends on the variation in the areas of land leased or distributed through agrarian reform per each cadastral unit in Al-Jazirah.

6. Variation of population diffusion from one place to another depends on variation in the rise above sea level per cadastral unit in Al-Jazirah.

7. Variation of population diffusion from one place to another depends on variation of lengths of asphalted roads per cadastral unit in Al-Jazirah.

Geographers use various criteria to illustrate the spatial diffusion of population and its variation as well as the phenomena related to it. This study has adopted quantitative measurement to illustrate the detailed differences from one place to another in order to project the picture of the spatial diffusion of Al-Jazirah's population and the factors affecting such diffusion.

It is necessary to adopt a criterion which indicates differences from one area to another in the phenomenon under study, namely population distribution. One statistical method is the use of standardized scores, an approach which is in conformity with the scope of this study. The standardized score is a criterion for defining the relative position of each value in the distribution to which it belongs in order to avoid the difficulties which may arise from the use of absolute figures and the implied dispersion of values to such an extent that the picture of their distribution is obscure (Abdul Adhim and Al-Masri, 1972, p. 129).

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Description of the Population Geographical Distribution in Al-Jazirah

The population of Al-Jazirah varies, in the light of standardized scores, from being positive to being negative. In other words, there are cadastral units in which the population exceeds the average for Al-Jazirah, while falling below this average in other units. Figure I shows the geographical distribution of the population in 1977 at four levels:

First level: Population distribution at this level is in two cadastral units, namely Telafar and Sinjar in the centre of Al-Jazirah.

Second level: This is the least common level in geographical terms and is limited to Al-Shimal nahiya located in the west of the region.

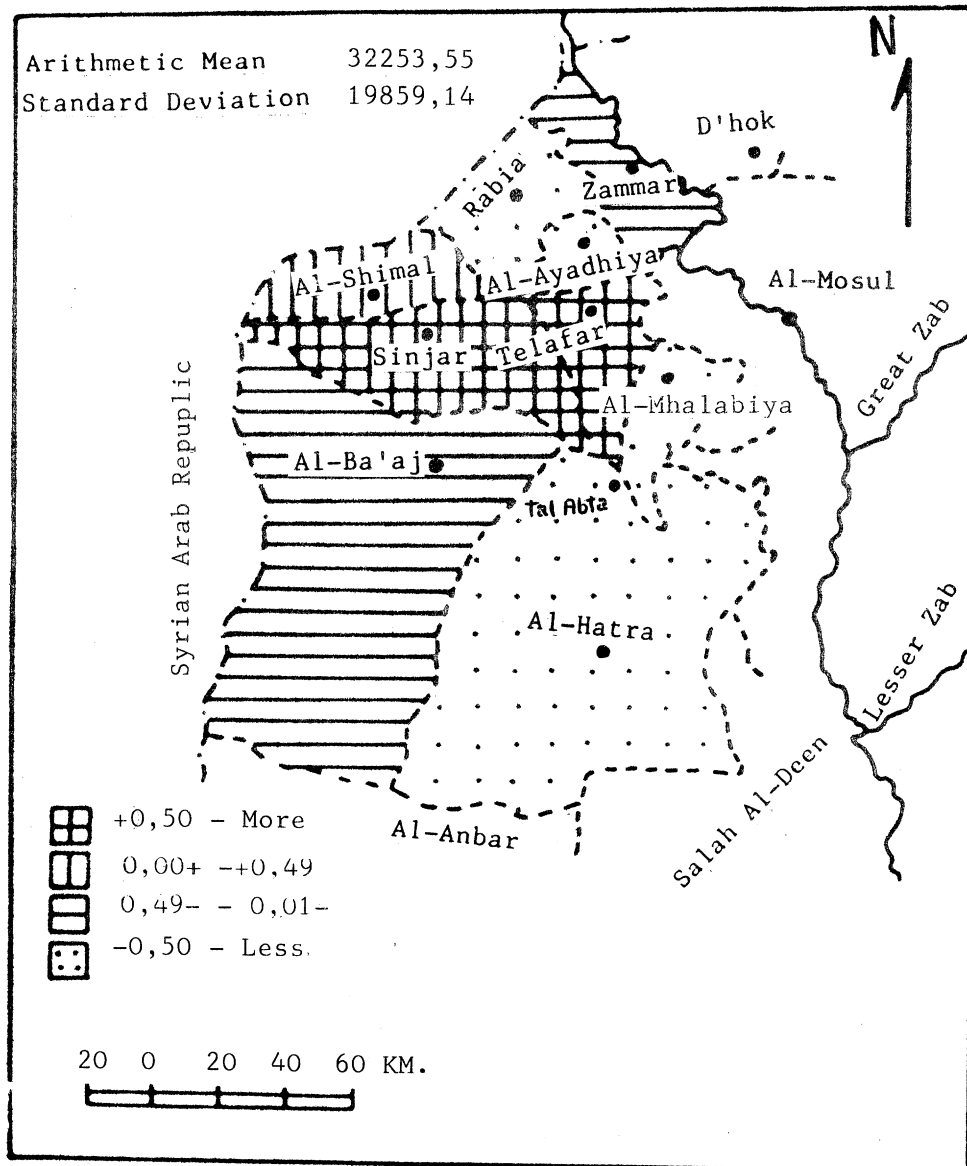
Third level: The population at this level is below the average for Al-Jazirah and is found in two cadastral units which are distant from one another, namely Zammar in the north and Al-Ba'aj in the south-west.

Fourth level: This is the most common level in terms of geographical area. It is found in two unconnected areas: the first comprises Rabia and Al-Ayadhiya nahias in the north, and the second comprises Al-Mhalabiya nahia and Hatra qadha in the south and south-east.

This shows that the population in three cadastral units is above the average for Al-Jazirah, while it is below the average in six units, whereas Telafar and Sinjar in the centre of the region are the most populated locations of Al-Jazirah, Rabia, Al-Ayadhiya in the north, and Al-Mhalabiya and Hatra in the south and south-east are the least populated.

Figure II shows that the same distribution continued at the four levels in 1987. The only

Figure I. GEOGRAPHICAL DISTRIBUTION OF AL-JAZIRAH'S POPULATION, 1977



Source: Drawn by the author, based on data derived from annex table 2.

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change which took place was at the third level, as Al-Ba'aj moved up to the second level in 1987 following the administrative changes as a result of the addition of new areas to this nahia, leading to the increase of its population as well as expansion of its total area. There was also emigration to Al-Ba'aj as shown by the rising sex ratio in the period between the two censuses from 99.6 to 100.3, because migration was mainly limited to males.

Regional variation among the population growth rates leads to variation in the relative distribution of the population among different cadastral units as shown in Table 1. Those units with a high growth rate in the period between the two censuses also showed a higher proportion of the population in the second census in addition to the presence of other factors (Al-Sa'adi, 1983, p. 46).

A comparison of the proportional distribution of population between 1977 and 1987 shows a rise in the period between the two censuses, in four units, namely Telafar, Rabia, Al-Ayadhiya and Al-Ba'aj. The proportional share of the remaining five units dropped.

The diminishing percentage of the share, as well as variation of the proportional distribution of the population, in the period between the two censuses is attributed to internal migration and variation of natural increase, or to adjustments of administrative borders. Changes in a unit may involve the separation of part of it and adding it to another unit, or vice versa, leading to fluctuation in the proportional distribution between one census and another. Migration also plays a major role in population distribution variation, because expulsion forces in some units drive people to attraction centres, especially in major cities.

The effect of the migration factor is clearly shown in the decrease of the population of Zammar nahia and Hatra gadha through decrease of the sex

TABLE 1. PROPORTIONAL DISTRIBUTION OF THE POPULATION AND DISTRIBUTION OF SEX RATIO IN AL-JAZIRAH, 1977 AND 1987

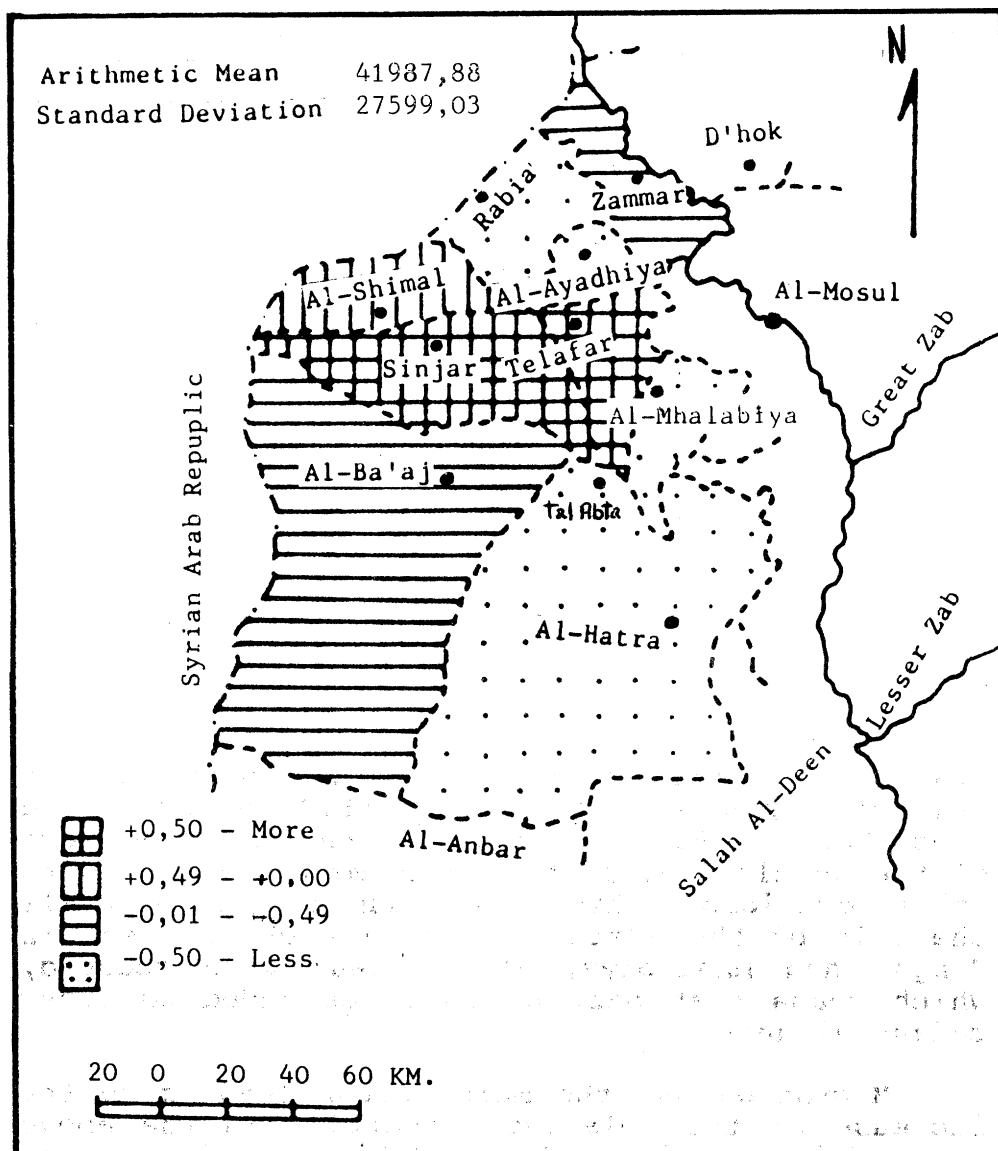
Cadastral units	Proportional distribution of population		Sex ratio	
	1977	1987	1977	1987
Telafar	22.9	27.0	96.6	102.8
Zammar	10.6	9.2	99.3	98.7
Rabia	7.2	7.3	97.8	104.7
Al-Ayadhiya	5.0	5.5	95.8	97.5
Sinjar	21.6	14.8	101.6	104.0
Al-Shimal	13.1	13.0	103.0	106.0
Al-Mhalabiya	5.2	3.4	92.4	94.6
Al-Ba'aj	8.5	14.6	99.6	100.3
Hatra	5.9	5.2	100.3	98.6
Al-Jazirah	100.00	100.0	99.1	102.0

Source: Iraq, Ministry of Planning, Population Census, 1977, Table 22; and the preliminary results of the 1987 census.

ratio in the period between the two censuses. The sex ratio dropped from 99.3 to 98.7 in Zammar and from 100.3 to 98.6 in Hatra, which means that some of the population, particularly males, migrated to other locations within Al-Jazirah or outside, while the role of the administrative factor is clear in Sinjar and Mhalabiya, whose areas were reduced, which means that part of them was added to other cadastral units.

Migration was the main factor leading to the increase of the relative proportion in the above four administrative units. This was evident from the relative increase in sex proportion in the second census in all these units, in addition to the effect of the administrative factor in Al-Ba'aj

Figure II. GEOGRAPHICAL DISTRIBUTION OF AL-JAZIRAH POPULATION, 1977



Source: Drawn by the author, based on data derived from: Iraq, General Population Census, 1987; Iraq, Annual Statistical Anthology for 1986, Tables 1/5, Appendix No. 1.

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gadha, whose administrative area increased after the first census, and because of the limited effect of the same factor in Al-Ayadhiya nahia, whose area was slightly expanded.

The largest increase taking place between the two censuses was in Al-Ba'aj, being 6.1 per cent, followed by Telafar, where the difference was 4.1 per cent. The clear increase in the share of each of these two units during the period between the two censuses was at the expense of the other units, especially Sinjar where the relative decrease of the population was the greatest.

The increase in Al-Ba'aj's and Telafar's share of population in the period between the two censuses means that there was concentration of the population in them, affecting the whole region. To reveal this concentration, an indicator for each census can be calculated by dividing 100 by the total number of cadastral units; the result is deducted from the relative share of population of each unit in each census and the result is then added to the positive or negative sign; the total is the required indicator.

The two indicators were 24.3 per cent and 25 per cent in 1977 and 1987, respectively, which affirms the presence of population concentration and a slight increase in the second census compared with the first census. In other words, there is unproportionate population distribution reflected in the concentration of population in certain locations and a scattering of the remaining population in other vast areas. This is also reflected by the deviation of the Lorenz curve of population distribution from the symmetrical line, and the rising of the value of the Gene factor from 62.2 per cent in 1977 to 66.6 per cent in 1987. This is also shown by the fact that about one fifth of the population of Al-Jazirah lives in about two thirds of the area, while about four fifths of the population lives in the northern part, the area of

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which does not exceed one third of the area under study.

Because of the population concentration in specific locations, it is necessary to redistribute the population through the use of the Redistribution Index (Eldridge and Thomas, 1964, pp. 55-56), which is the percentage, at the end of the period, of the population of the region to be redistributed among the cadastral units in order to obtain the distribution prevailing at the start of the period. The Redistribution Index reached 10.8 per cent. By using this index, it was possible to determine the size of the population to be redistributed at the end of the period, by multiplying the index by the total population at the end of the period divided by 100, as shown in the following equation:

$$\text{Population to be redistributed} = \frac{10.8 \times 377,891}{100} = 40,812.$$

The population to be redistributed in Al-Jazirah during the period 1977-1987 shows the existence of population concentration in some regions at the expense of other regions.

Factors Clarifying the Variation of Spatial Diffusion of Population

Variation of physical and human phenomena, such as the rise or flatness of an area, as well as the features related to its climate, floral and water resources, different social systems, means of transport and legislation and other factors, all lead to spatial variation of population, differences in the size of the settlements and modes of diffusion. Man chooses the most suitable conditions for settlement and leaves the areas which are impossible to inhabit. These factors can be classified as follows:

1. Rise above sea-level.

Because the rise above sea-level in Al-Jazirah ranges between 50 m and 550 m, it has been

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easy for man to settle in that region. However, variation in the relative rise above sea-level from one area to another affects climatic factors, especially temperatures and rainfall, as well as the indirect effect of these factors on the soil, flora, underground water and methods of land utilization. In their turn, these factors are of great importance in the variation of population diffusion, because they directly affect man's activities, modes of living and ability to adjust to the characteristics of the environment in order to utilize its resources.

2. Area of arable land.

Arable land provides areas suitable for human settlement and promotes human activities, including agriculture. The soil in the northern part of Al-Jazirah is deep and rich in organic matter and consequently is more suitable for agriculture than that of the southern part. In general, arable land accounts for more than one third (37.7 per cent) of the total area of Al-Jazirah, and about half of the total arable land in Nineveh province.

3. State legislation.

In this study, "legislation" refers to those laws related to agrarian reform land (leased and distributed to farmers), including the agrarian reform laws of 1958 and 1970. However, other laws concerned with land also have had great impact on the confirmation of ownership of agricultural land and rights to land use, which has led to the settlement of formerly nomadic tribes. Al-Jazirah has also passed through the experience of settling nomadic tribes and establishing them in stable communities. An example of this was the establishment of Rabia Model Village in 1960 (Al-Qassab, 1969, p. 295).

The tribes usually settle in certain areas, leaving their cultivated or unutilized land uninhabited, or almost uninhabited, as is the case

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with the agrarian reform land (leased and distributed) resulting from the prevailing type of agriculture there, which is a type of extensive agriculture which depends on mechanization.

A comparison between the map of the population's geographical distribution and the standardized scores of agrarian reform land shows an inverse relationship between the two phenomena. The above type of agriculture does not require intensive labour. Furthermore, there are uncultivated areas of land.

4. Asphalted roads.

Road traffic and transport systems play a major role in various economic and social activities. The effect of transport systems in the region under study appears from the number of surfaced roads and other rural roads under construction, which will speed up the implementation and reduce the cost of agricultural and irrigational projects, due to the ease and speed provided by these roads in the delivery of agricultural equipment and materials and transportation of human resources. The connection of the Baghdad-Mosul railway to Tel Kuchuck near the Iraqi-Syrian border had a decided effect on the emergence of new settlements and development of those already existing.

Comparing the map of the population's geographical distribution and the standardized scores of the lengths of surfaced roads indicates a positive correlation and spatial linkage between the two phenomena in six cadastral units.

5. Total area.

Total area greatly varies from one cadastral unit in Al-Jazirah to another. While Al-Ayadhiya nahia occupies 2.6 per cent of the total area of Al-Jazirah, Hatra qadha occupies more than 36 per cent of the total area. Variation in the total area is reflected in variation in population

density and concentration or dispersion of people in the units under discussion. A comparison between the map of the geographical distribution of population and the standardized scores of the total area indicates an inverse relationship and weak spatial correlation between the two phenomena.

6. Annual rainfall.

Annual rainfall in Al-Jazirah is between 200 mm and 500 mm (Mohammed, 1987, p. 224). Patterns of rainfall determine the type of agricultural products that can be grown in a given area. Rainfall is also essential in recharging groundwater, and it directly affects the amount of water flowing into valleys. Rainfall increases towards the north and east. The same applies to the quality of soil, number of wells and share of rivers and springs, contrary to the southern parts of the region, which are considered pastoral and which receive less rain. Thus the size and number of villages is higher in the northern parts than in the southern parts.

About 77 per cent of the population of Al-Jazirah lives in the northern part, which has a population density of about 39 persons per square kilometre; the proportion of the population in the southern section is about 23 per cent, and the population density there does not exceed 5 persons per square kilometre, according to the 1987 census.

A comparison of the map of the geographical distribution of population and the standardized scores of annual rainfall indicates a positive correlation and spatial linkage between the two phenomena.

7. Areas irrigated by wells.

The role of groundwater becomes more vital in desert areas, especially when rainfall is low, causing scarcity of cultivated areas and human settlements.

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Rock formations in Al-Jazirah are capable of storing large amounts of underground water, which is utilized by means of artesian wells; quality, salinity and depth of water vary from one well to another.

Studies have shown a correlation between rainfall and the level and quantity of groundwater and, consequently, the number of wells and their distribution. In the northern part of Al-Jazirah (north of Sinjar), the amount of groundwater is estimated to be about 200 million cubic metres, while it is about 79 million cubic metres south of Sinjar and 55.5 million cubic metres north of the western desert plateau (The Ralph M. Parsons Engineering Co., n.d., pp. 111-112).

Accordingly, the northern part of Al-Jazirah has about 87.5 per cent of the pumps, 86 per cent of the horsepower and 91.5 per cent of the irrigated land. These percentages truly reflect the effects of the natural conditions in the region such as groundwater, rainfall and type of soil.

A comparison of the map of the geographical distribution of population and standardized scores of the areas irrigated by wells shows a positive correlation as well as spatial linkage between the two phenomena in four cadastral units.

The present utilization of land, which depends on rain or wells, has not encouraged permanent human settlement at the desired level; the hard conditions of the natural environment, fluctuation of rainfall and the present type of utilization of land dictated by the above conditions have led to low population density. However, this picture is due to change when Al-Jazirah Irrigation Project (northern and southern), which will irrigate about 800,000 dunums in the region, is completed (Iraq, Ministry of Irrigation, n.d., pp.7-12). This will lead to a number of changes in the socio-economic structure of the population (see figure III).

8. Wheat and barley planted area.

This variable has been ignored due to the lack of any effect on the variation of population diffusion.

Testing the Hypothesis of the Study

Visual comparison between the maps of distribution of variables related to the variation of population diffusion from one cadastral unit to another, to identify the factors that clarify the geographical distribution of the phenomenon under study, is an important analytical method. However, this method cannot determine the extent of the relationship between the phenomenon under study and each variable that separately explains its distribution, as well as the degree of relationship among all these variables as required by sound scientific work.

To determine the extent of this relationship, the methods of quantitative analysis were employed by using simple and multiple correlation coefficients to confirm the existence of the correlation shown by visual comparison between the various distribution data expressed by standardized scores, on the one hand, and to determine the degree of relationship among the above phenomena, on the other hand. Measurement of the degree and direction of these relationships helps geographers to interpret different spatial phenomena variation.

Population, in this study, is the dependent variable y , and the independent variables comprising the interpretive phenomena which are linked to it by a spatial relationship are represented by x_1 (total area), x_2 (arable area), x_3 (land planted with wheat and barley), x_4 (land irrigated by wells), x_5 (agrarian reform land), x_6 (rainfall), x_7 (rise above sea level) and x_8 (asphalted roads).

The simple correlation variable is an essential step in carrying out the multiple correlation

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processes. Table 2 shows the degree of simple correlation between population per cadastral unit and relevant phenomena, each by itself as well as together, and also shows their directional degree.

Table 2 also shows a negative correlation between population and each of agrarian reform land (x5) in the first place and the total area (x1) in the second place, while there is a positive correlation between population and the remaining variables, with the seventh variable (rise above sea level) coming first, followed by the fourth variable (area irrigated by wells), the second variable, sixth variable and eighth variable.

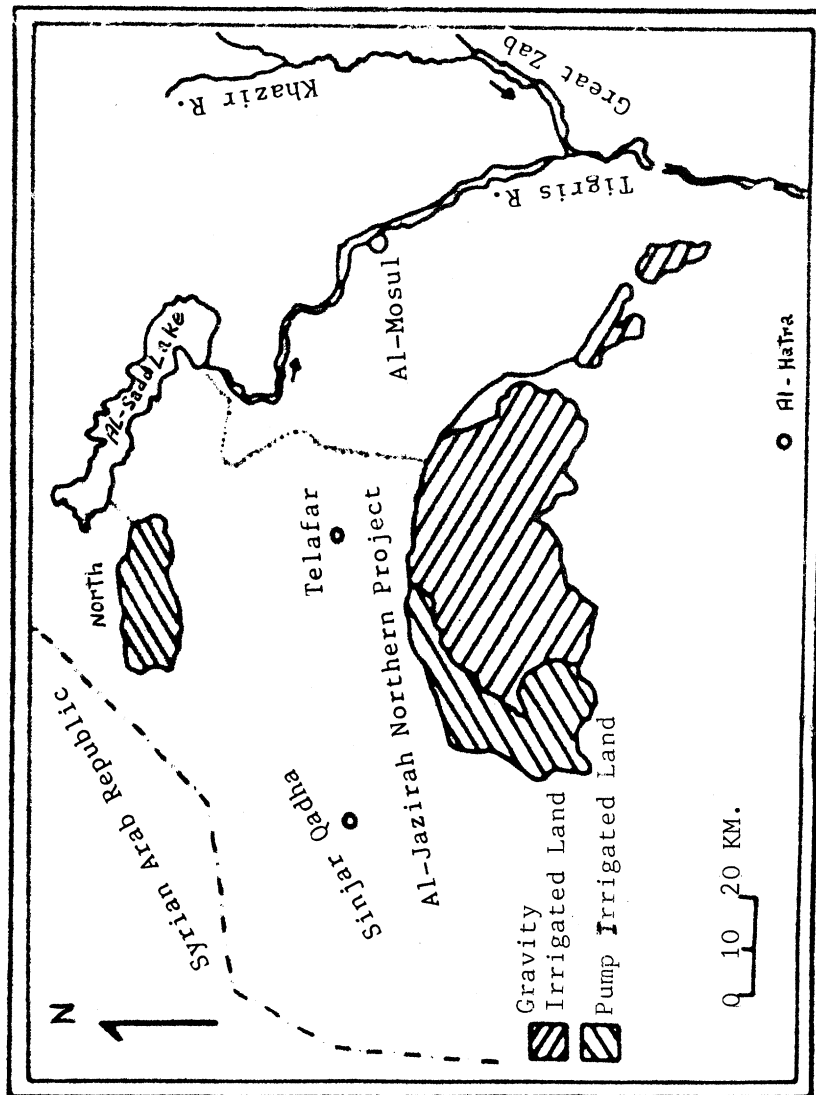
As for the correlations among the variables, the matrix of the correlation coefficients indicated a strong relationship: between the first variable (total area) and each of the fifth variable (agrarian reform land), sixth variable (rainfall) and seventh variable (rise above sea level); between the second variable (arable area) and each of the third variable (wheat and barley planted area) and eighth variable (asphalted roads); between the fifth and third variables; and between the sixth and seventh variables. The value of the correlation factor between these variables ranged between 0.67 and 0.91, whether positive or negative.

These variables were tested using the t-test.¹ The t value in calculating these variables ranged between 2.4 and 6.1, which is higher than (t) tabulated value of degrees of freedom 7 (N-2) and the statistical significance level of indication 5 per cent, which indicates the presence of a significant correlation between the above variables.

1

$$\text{The equation of the t-test is } t = \frac{r (N-2)}{1 - r^2}.$$

Figure III. NORTHERN AND SOUTHERN AL-JAZIRAH IRRIGATION PROJECT



Source: Iraq, Ministry of Irrigation.

TABLE 2. MATRIX OF SIMPLE CORRELATION COEFFICIENT BETWEEN POPULATION AND RELEVANT PHENOMENA

Phenomena	Y	x1	x2	x3	x4	x5	x6	x7	x8
Y	1	-0.24348	0.50979	0.32358	-0.51876	0.28398	0.43646	0.56717	0.28626
x1		1	0.41457	0.44353	-0.08931	0.70440	-0.91705	-0.72747	0.00713
x2			1	0.86294	0.58267	0.45953	-0.16453	0.07875	0.71800
x3				1	0.66944	0.67036	-0.22198	0.18722	0.65297
x4					1	0.16346	0.30137	0.55031	0.48060
x5						1	-0.62839	-0.31000	0.11313
x6							1	0.81562	0.23215
x7								1	0.34512
x8									1

Source: SPSS (Statistical Package for the Social Sciences) based on data from annex table 1.

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It is well known that simple correlation measures the degree of the relationship between one of the independent variables and the dependent variable only. Therefore, it does not explain the relative importance of the independent variables in interpreting the variation in the dependent variable.

Since the aim of this study is to identify the effect of independent variables as a whole on the dependent variable, it is appropriate to use the multiple correlation coefficient; the Stepwise Regression Programme contained in the Statistical Package for the Social Sciences (SPSS) is useful in this regard.

The stepwise regression method consists of calculating the multiple correlation between independent variables and the dependent variable. The variables which do not show a significant indication (those with low correlation) are excluded, as was the case with the third variable (wheat and barley planted land) in the present study. The variables are arranged according to their importance or contribution to the degree of variation in the dependent variable depending on the value of R^2 and, consequently on the value of F or the F -ratio in the analysis of variation (King, 1967, pp. 144-148).

In the light of the multiple correlation coefficients and the regression analysis between population and the relevant variables in Al-Jazirah, the results indicated in table 3 are concluded.

Statistical analysis of stepwise regression revealed the following:

1. The picture of spatial diffusion of the population and its variation from one place to another in the region under study is related to a number of variables, and not to one single variable. No one variable can provide a full interpretation of

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the picture of diffusion, although the role of each differs in the above interpretation, as shown by the simple correlation coefficient.

2. Variation of population diffusion from one place to another is inversely related to the total area and to the State legislation represented by the agrarian reform land (both leased and distributed) and is positively related to the other variables.

3. The variables contributing to the variation in population diffusion were selected according to the size of the relation and arranged in descending order as in table 3.

These variables have a certain weight according to the type of measurement. Rise above sea level accounted for 32 per cent of the variation in population diffusion from one place to another, while the contribution of the length of surfaced roads to the interpretation of the above variation was about 22 per cent, a ratio close to that of arable land. The contribution of agrarian reform land (leased and distributed) was about 17 per cent. The role of each variable in the interpretation of the variation of population spatial diffusion has already been explained. The remaining variables (total area, rainfall, area irrigated by wells) contributed slightly, not more than 5 per cent, in the interpretation of variation.

4. Ninety-eight per cent of the variation in population diffusion can be predicted by defining the above seven variables. The remaining 2 per cent is attributed to other factors which the multiple regression equation could not explain. The multiple correlation coefficient was 0.99232 and consequently there is a slight possibility for the occurrence of this correlation at this degree by chance.

5. When the regression significance of these variables was tested using F-ratio analysis, it was

TABLE 3. MULTIPLE-CORRELATION COEFFICIENT, DETERMINATION COEFFICIENT AND TEST OF REGRESSION SIGNIFICANCE AMONG POPULATION AND THE RELEVANT PHENOMENA ACCORDING TO THE STEPWISE REGRESSION

Step	Variable number	Independent Variable	Correlation coefficient		F Ratio	Determination coefficient R ²	Tabulated F	
			Multiple R	Simple R			5% level	1% level
First	7	Rise above sea level	0.56717	0.56717	7.95	0.32168	5.59	12.12
Second	2	Arable land	0.73442	0.50978	22.98	0.53937	5.14	10.90
Third	5	Agrarian reform land leased and distributed	0.84082	-0.28398	12.57	0.70697	5.41	12.10
Fourth	8	Length of asphalted roads	0.96417	0.38626	15.76	0.92963	6.39	16.00
Fifth	1	Total area	0.97363	-0.24348	2.88	0.94795	9.01	28.20
Sixth	6	Annual rainfall	0.98165	0.43646	1.48	0.96363	19.30	99.30
Seventh	4	Area irrigated by wells	0.99232	0.51876	1.38	0.98469	237.00	5928.00

Source: SPSS (Statistical Package for the Social Sciences) based on data from annex table 1, except tabulated F.

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found that each of the first four variables listed under the sequence of steps (namely rise above sea level, arable land, agrarian reform lands and length of asphalted roads) has a significant relation at the level of 5 per cent and the corresponding degrees of freedom of F-value for each variable. The second and fifth variables, and to a certain extent the eighth variable, have a significant relation at the level 1 per cent, because the calculated F-value exceeds the tabulated F value. Because of the presence of the statistical significance, we reject the hypothesis stating that $r = \text{zero}$ and accept the alternative hypothesis that the value of r is not equal to zero. Thus the relation between the above variables has high significance and contributes to the interpretation of about 93 per cent of the population diffusion in the area under study. This confirms the validity of the hypothesis of this study, namely that there is a linear relation between them i.e., the relation between these variables appears as a straight line distributed around their values. The remaining variables (first, fourth and sixth variables) do not have statistical significance at the level of 5 per cent or 1 per cent and therefore their contribution was limited in the interpretation of the variation of population distribution.

It appears that the overlapping of the common effects of the different variables has led to the most effective factors in the variation of population diffusion. The strongest effect was that of arable land, followed by that of agrarian reform. Consequently, the total area no longer has the desired effect. Besides, despite its great importance, rainfall was the result of other factors, mainly rise above sea level. Moreover, the weak effect of the area irrigated by wells was the result of the small size of this area, small number of pumps used and their limited horsepower.

6. The study arrived at a mathematical model for the spatial relations of the variation of

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population diffusion in Al-Jazirah which is a statistical model with a geographic population framework, through a regression-analysis equation which clarifies the prediction of the above variation of population diffusion. This equation consists of the variables of partial regression and one constant, k. The model is as follows²:

$$\begin{aligned} y = & x_1 0.01078 + x_2 0.11120 - x_4 1.61449 \\ & - x_5 0.06691 + x_6 208.90289 \\ & + x_7 150.12856 - x_8 415.39324 \\ & - 106,225.81865 \end{aligned}$$

This model has considerable importance, as it is used in predicting the value of population changes, and when applied in any cadastral unit in Al-Jazirah, it helps to predict the population if we know the corresponding values of the above independent values.

CONCLUSION

The study of the spatial population diffusion in Al-Jazirah has shown that there are cadastral units in which the population is the highest, compared with the average population of the region, while it gradually drops in other units. The highest distributional level was in Sinjar and Telafar in the middle of the region, falling in Al-Shimal nahiya nearby. The lowest distributional level was in Al-Ayadhiya and Rabia nahiyas north of the first level and Al-Mhalabiya nahiya and Hatra gadha south of it. This level is slightly higher in Zammarr in the extreme north, and Al-Ba'aj in the extreme south-west.

Spatial diffusion of population in Al-Jazirah is sound in terms of the presence of the nucleus in

² The formula is as follows:

$$Y = ax_1 + bx_2 + cx_3 + dx_4 + ex_5 + fx_6 + gx_7 + hx_8 + k$$

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the centre and not in the periphery. However, there is no gradation in this diffusion outside the centre, which means that there is imbalance in the population diffusion among cadastral units reflected in the lack of balance in the implementation of development plans in one way or another.

A detailed study of Rabia nahiya, one of the districts in Al-Jazirah, has shown that spatial diffusion of its population was not sound because of the presence of the nucleus in the periphery and not in the centre. This is clear from the higher concentration of population in the southern and south-western parts compared to a lower level of diffusion in the remaining parts.

Accordingly, the study recommends the redistribution of about 41,000 people in Al-Jazirah to effect a kind of harmonious distribution, i.e., achieving a balance of population to be distributed at similar levels. This requires raising the population of the sparsely populated units to reach the average level of the region of study, or even more, in order to ensure the labour needed to utilize those units, which can be implemented in the light of the variables related to population growth in the above-mentioned units.

To achieve such an objective, development plans should achieve population-equilibrium in the region in general. This requires the introduction of services and development facilities in those villages and population-expelling areas, to make them population attracting areas; these would involve mainly water and electricity services, education, health, proper housing, road asphaltting, the establishment of agricultural projects and permanent irrigation. Al-Jazirah Irrigation Project (northern and southern) will play a major role in achieving such development.

**Annex table 1. POPULATION DISTRIBUTION AND FACTORS AFFECTING THEIR VARIATION
IN AL-JAZIRAH REGION, 1977.**

Cadastral Units	Population	Total area (dunum)	Arable area (dunum)	Wheat & barely planted area (dunum)	Area irrigated by wells (dunum)	Agrarian reform lands (dunum)	Annual rainfall (mm)	Rise above sea level (metre)	Length of surfaced roads (km)
Telafar	66 582	486 400	441 296	108 127	126	46 266	357	400	34
Zammar	30 799	522 000	396 407	107 588	4 147	103 549	337	350	46
Rabia	20 969	596 000	575 000	242 320	155	427 371	342	350	90
Al-Ayadihiya	14 504	292 800	131 723	103 200	543	291 226	357	450	40
Sinjar	62 571	1 048 800	878 229	619 600	8 878	478 960	360	550	128
Al-Shimal	37 940	614 400	478 599	249 158	679	246 661	312	450	70
Al-Mhalabiya	15 018	410 000	199 155	153 650	57	187 616	325	350	44
Al-Ba'aj	24 693	3 336 400	680 487	344 450	501	346 779	268	250	120
Hatra	17 206	4 130 000	530 336	350 900	792	725 066	209	200	10
Arithmetic mean	32 253.55	1 270 755.55	479 025.77	253 221.44	1764.22	317 05 4.88	318.55	372.22	64.66
Standard	19 859.14	1 425 248.81	228 853.14	168 417.17	2951.30	208 27 4.98	50.25	106.39	40.39

Sources: Iraq, 1978, table 22; Al-Yassin, 1984, tables 8, 26, 48, 65; Iraq, Military Surveying Office, 1987.

Annex table 2. STANDARDIZED SCORES OF POPULATION AND RELEVANT PHENOMENA, 1977

Cadastral Units	Population	Total area	Arable area	Wheat & barely planted area	Area irrigated by wells	Agrarian reform lands	Annual rainfall	Rise above sea level	Length of asphalted roads
Telaifar	1.72	-0.55	-0.16	-0.86	-0.55	-1.30	0.76	0.26	-0.75
Zammar	-0.07	-.52	-0.36	-0.86	0.80	-1.02	0.36	-0.20	-0.46
Rabia	-0.56	-0.47	0.41	-0.06	-0.54	0.52	0.46	-0.20	0.62
Al-Ayadhiya	-0.89	-0.68	-1.51	-0.89	-0.41	-0.12	0.76	0.73	-0.61
Sinjar	1.52	0.73	1.74	2.17	2.41	0.77	0.82	1.67	1.56
Al-Shimal	0.28	-0.46	-1.86	-0.02	-0.36	-0.33	-0.13	0.73	0.13
Al-Mhalabiya	-0.86	-0.60	-1.22	-0.59	-0.57	-0.62	0.12	-0.20	-0.51
Al-Ba'aj	-0.38	1.44	0.88	0.54	-0.42	0.14	-1.00	-1.14	1.37
Hatra	-0.75	2.00	0.22	0.57	-0.32	1.95	-2.18	-1.61	-1.35

Source: Derived from data in annex table 1.

Annex table 3.

POPULATION DISTRIBUTION,
STANDARDIZED SCORES AND AREA
IN AL-JAZIRAH REGION, 1987.

Cadastral area	Population	Standardized score	Area (square km)	
			1977	1986
Telafar	102 204	2.18	1 216	824
Zammar	34 677	-0.26	1 305	1 268
Rabia	27 719	-0.51	1 490	1 431
Al-Ayadhiya	20 838	-0.76	732	784
Sinjar	55 956	0.50	2 622	1 474
Al-Shimal	48 967	0.25	1 536	1 716
Al-Mhalabiya	12 980	-1.05	1 025	790
Al-Ba'aj	55 074	0.47	8 341	8 892
Hatra	19 476	-0.81	10 325	9 122
Al-Jazirah	377 891	-	28 592	26 301

Sources: Iraq, General Population Census, 1987;
Iraq, 1987, Annual Statistical Anthology for 1986,
Tables 1/5; annex table 1.

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STRUCTURAL CHANGE IN THE ARABIAN GULF: IMPACT OF THE FOREIGN WORKFORCE

Robert E. Looney

Introduction

Since the early 1970s, international movement of labour has played a pivotal role in the economic growth of the oil-exporting countries of the Middle East. Such movement has had socio-economic repercussions that go far beyond the immediate boundaries of the region. From the labour-importing countries' point of view, their demand for labour seems to have been based primarily on economic grounds, i.e., to meet economic growth targets. Demographic concerns were given secondary policy consideration. Similarly, the response of the labour-exporting countries was based on the economic consequences of the expected flows, e.g., the effects of workers' remittances on foreign exchange constraints. An implied view of the labour-exporting countries is that emigration is an export industry that needs encouragement and even development (Sirageldin, 1983).

To date, most of the discussion concerning migration in the Middle East has focused on such issues as: (a) the effects of migration on the structure of the receiving country's labour force; (b) social frictions between the expatriate labour force and the domestic population; and (c) likely effects of income remittance and skill transfers on the countries of origin of the migrant workers.

An equally important aspect that has received only scant attention concerns the actual economic impact of the foreign workforce, i.e. in what ways has the foreign workforce contributed to the receiving country's economic diversification strategies? In this regard, how have the foreign workers differed from their domestic counterparts in effecting structural change? The purpose of this paper is to address these issues.

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Patterns of Migration

After 1973, the economies of the Gulf region attracted such an inflow of foreign workers (and in some cases their families) that by the late 1980s immigrants constituted a significant proportion of their populations. Due to the growth of oil revenues and oil surpluses in the 1970s, the scale of planned industrialization expanded markedly. Saudi Arabia, Kuwait, Qatar, and the United Arab Emirates became the largest users of migrant labour (Arikat, 1986).

The six Gulf States have small indigenous populations, and only Saudi Arabia has a population of over 2 million. Shortages of domestic labour have been a binding constraint on growth; rapid economic development and industrialization could not take place without the import of labour. At least in the post-1973/74 era, manpower shortages in the region can be attributed to five major factors (Shaw, 1981):

1. Development plans in the oil-rich countries are extremely ambitious with respect to manpower requirements. In the early years, much of this manpower was needed for vast infrastructure projects. Later on, these requirements shifted towards skilled expatriate workers merely to manage and operate the new infrastructure.

2. Grants-in-aid from the oil-rich to the oil-poor countries have fuelled the demands for key operatives to man selective industrial projects. Manpower shortfalls in these countries have been exacerbated by attractive wages in the oil-rich countries. These salary scales have been acting as a huge magnet to lure away the most educated and experienced workers.

3. The Arab region has long suffered from "brain drain". Over the last 20 years, tens of thousands of highly skilled personnel have emigrated

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to Europe and North America.

4. Governments have been increasingly motivated to nationalize their labour force and "Arabize" their educational systems. This has increased the demand for Arab nationals to replace expatriates. The primary manpower goal in this effort is to increase Arab representation in the key productive sectors of research and development, teaching, manufacturing and construction. The primary educational goal is to protect the Arabic language and Arab culture from the overly rapid penetration of Western influence.

5. Shortages in most sectors stem from inadequacies on the supply side. These pertain to the quantity, quality and distribution of Arab education itself. In the poor countries, this is and threatens to remain one of the most visible symptoms of underdevelopment. The same applies to the oil-rich countries, though impressive improvements in infrastructure and personnel are beginning to close the most glaring gaps.

Coinciding with manpower shortages, most of the Gulf States suffer from manpower underutilization, underemployment and structural imbalances in their labour forces. This underutilization is evidenced by the very low participation rates in the region, which is due mainly to the high percentage of children between 0-14 years -- over 40 per cent of the population -- and of course the low rate of employment of women.

In terms of the actual pattern of employment (tables 1 and 2), the Gulf States vary considerably in terms of the relative importance of foreign workers.¹ In 1985, foreign workers comprised well

¹ The 1985 figures were calculated by adjusting "low" labour forecasts presented in Sirageldin, Socknat, Birks, Li, and Sinclair (1983). Based on

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over 80 per cent of the workforce in Qatar and the United Arab Emirates. Next in terms of foreign worker dependence was Kuwait, where nearly 65 per cent of the workforce were non-nationals. Despite many public statements of the Government's avowed goal to reduce the dependence on foreign workers, non-national workers increased their share of the Saudi Arabian workforce, from 34 per cent in 1975 to nearly 50 per cent by 1985.

The labour-exporting countries were led by Egypt on an absolute basis. However, Jordan, Lebanon, Oman, the Yemen Arab Republic and Democratic Yemen (before unity) had much higher percentages of their labour force working overseas.

The sectoral distribution of the foreign workforce has varied somewhat from country to country, but aggregate figures are fairly accurate depictions of the situation in the individual economies. In 1975 non-nationals dominated two sectors: construction, where their share was 79 per cent, and manufacturing where their share was 67 per cent (table 3).

Only in agriculture was the percentage of non-nationals low (9 per cent). The traditional nature of agriculture explains this slight representation of migrants, because international migration to these countries tends to be to the modern rather than the traditional sector. This situation has changed somewhat over the years in Saudi Arabia and the Libyan Arab Jamahiriya, where

Gulf Cooperation Council (GCC) employment figures presented in Birks and Sinclair (1989), the 1985 forecast figures were then proportionalized downward to reflect the recent fall-off in the region's demand for foreign workers. The total labour forces (domestic plus foreign components) of the labour-exporting countries were assumed to be unchanged, but their compositions were adjusted to reflect the lower foreign component. The figures for 1980 were calculated by interpolating the 1975 and 1985 figures.

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modernization of the agricultural sector and withdrawal of national labour from it increased the demand for foreign labour.

The figures in table 3 anticipated that the percentage of foreign labour in each sector would increase through 1985, even in the low forecast for that year.

Patterns of Structural Change

The changing sectoral composition of the labour force has taken place in an environment with several characteristic structural features and discernable trends in the sectoral shares of gross domestic product (GDP) (tables 4-6):

1. The manufacturing sector along with agriculture has retained a more or less steady (albeit low) share of GDP (1 and 6 per cent respectively).

2. While much publicity has been given to expansion of the construction sector in the GCC region, its share was relatively constant, increasing from 7.6 per cent of GDP in 1975 to 8.0 in 1985.

3. During the period 1975-1985, the most significant structural shifts for the GCC countries as a group were towards the service sectors, i.e., housing, government services and other services. During this period, the share of service activities increased from 9.5 per cent of GDP in 1975 to 11.2 in 1980 and 19.6 by 1985.

4. The distribution sector consists of: (a) commerce, restaurants and hotels; (b) transportation, communication and storage; and (c) finance, insurance and banking. It experienced a similar pattern, with its share increasing from 13.1 per cent of GDP in 1975 to 16.2 in 1980 and 21.8 in 1985.

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Table 1. ESTIMATES AND FORECASTS OF EMPLOYMENT IN THE ARAB WORLD, 1975-1985

(Labour force in thousands)

Importing countries	1975		1980		1985	
	Total	Non-national (%)	Total	Non-national (%)	Total	Non-national (%)
Bahrain	78	37.0	104.0	41.7	129.2	46.3
Kuwait	297.5	70.8	782.2	67.6	392.8	64.3
Libyan	734.5	38.2	997.3	42.3	1 260.0	46.3
Arab Jamahiriya						
Oman	192.1	53.7	224.5	47.5	256.8	41.2
Qatar	73.8	83.1	103.7	84.5	133.5	85.8
Saudi Arabia	1 968.4	34.0	2 511.6	41.4	3 054.8	48.8
UAE	292.4	84.7	431.0	87.0	569.6	89.2
Algeria	3 082.9	0.3	3 518.3	1.7	3 953.5	3.1
Iraq	3 007.6	0.2	3 632.6	2.0	4 257.6	3.8

Exporting Countries	1975			1980			1985		
	Total	Abroad (%)	Domes-tic (%)	Total	Abroad (%)	Domes-tic (%)	Total	Abroad (%)	Domes-tic (%)
Egypt	9 070	3.7	8 734	10 112	4.5	9 657	11 154	5.2	10 574
Jordan	207	40.2	124	296	40.6	176	385	41.0	227
Lebanon	522	5.0	496	554	8.0	510	587	10.9	523
Oman	89	25.8	66	120	24.3	91	151	22.8	117
Sudan	3 674	0.7	3 648	3 518	1.5	3 465	3 361	2.3	3 284
Syrian Arab Republic	1 741	2.1	1 704	1 839	3.3	1 778	1 936	4.5	1 849
Tunisia	1 599	1.8	1 570	1 757	2.5	1 713	1 914	3.1	1 855
Yemen	1 033	24.1	784	1 061	25.0	796	1 087	25.9	805
PDRY	311	12.9	271	333	15.8	280	354	18.6	288

Other countries	1975		1980		1985	
	total		total		Total	
Morocco	4 308		4 620		4 932	

Source: Sirageldin, Socknat, Birks, Li and Sinclair, 1983, p. 26.

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Table 2. ESTIMATES OF EMPLOYMENT IN THE GCC STATES, 1985

(In thousands)

Importing countries	1985 forecast				1985 estimated		
	Total	National	Foreign	(%)	Total	National	Foreign
Bahrain	129.2	69.4	59.8	53.7	129.6	69.6	60.0
Kuwait	392.8	140.4	252.4	35.7	345.7	123.4	222.3
Oman	256.8	151.1	105.7	58.8	507.3	298.3	209.0
Qatar	133.5	18.9	114.6	14.2	115.5	16.4	99.1
Saudi Arabia	3 054.8	1 565.2	1 489.6	51.2	2 716.0	1 390.6	1 325.4
UAE	569.6	61.6	508.0	10.8	567.6	61.3	506.3
Sub-total	4 536.7	2 006.6	2 530.1		4 381.1	1 959.6	2 421.5
Other Arab-Labour importers							
Libyan Arab Jamahiriya	1 260.0	672.8	587.2	53.4	1217.2	650.0	567.2
Algeria	3 953.5	3 830.9	122.6	96.9	3 819.5	3 700.7	118.8
Iraq	4 257.6	4 095.8	161.8	96.2	4 112.8	3 956.5	156.3
Sub-total	9 471.1	8 599.5	871.6		9 149.5	8 307.2	842.3
TOTAL	14 007.8	10 606.1	3 401.7		13 530.6	10 266.8	3 263.8
Exporting countries	1985 forecast				1985 estimated		
	Total	Over-seas	Domestic	Over-seas	Total	Overseas	Domestic
Egypt	11 154	5.2	10 574	580	11 178	556	10 622
Jordan	385	41.0	227	158	391	152	239
Lebanon	587	10.9	523	64	590	61	529
Oman	151	22.8	117	34	152	33	119
Sudan	3 361	2.3	3 284	77	3 364	74	3 290
Syrian Arab Republic	1 936	4.5	1 849	87	1 940	83	1 857
Tunisia	1 914	3.1	1 855	59	1 916	57	1 859
Yemen	1 087	25.9	805	282	1 099	270	829
PDRY	354	18.6	288	66	357	63	294
Other countries	1975 total			1980 total			1985 total
Morocco	4 308			4 620			4 932

Source: Sirageldin, Socknat, Birks, Li and Sinclair, 1983, p. 26.

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Table 3. EMPLOYMENT OF NATIONALS AND NON-NATIONALS BY ECONOMIC
SECTOR IN THE MAJOR LABOUR-IMPORTING COUNTRIES:
ACTUAL 1975 FIGURES, "LOW" FORECASTS, 1985

(In thousands)

Sector	1975			1985		
	Total	% for each sector Share (%)	% for each Share (%)	Total	% for each sector Share (%)	% for each Share (%)
<u>Agriculture</u>						
Nationals	935.1	90.8	45.9	804.7	73.6	30.0
Non-nationals	94.9	9.2	5.9	288.5	26.4	9.3
<u>Mining</u>						
Nationals	41.6	63.2	2.1	47.6	46.5	1.8
Non-nationals	24.2	36.8	1.5	54.8	53.5	1.8
<u>Manufacturing</u>						
Nationals	48.7	33.2	2.4	119.1	40.1	4.4
Non-nationals	97.8	66.8	6.1	177.4	59.9	5.7
<u>Utilities</u>						
Nationals	28.7	53.8	1.4	44.9	43.3	1.7
Non-nationals	24.6	46.2	1.5	58.7	56.7	1.9
<u>Construction</u>						
Nationals	153.2	21.3	7.5	396.6	31.7	14.8
Non-nationals	563.9	78.7	35.2	853.1	68.3	27.4
<u>Trade and finance</u>						
Nationals	163.5	42.4	8.0	255.4	39.8	9.5
Non-nationals	221.6	57.6	13.8	401.3	61.1	12.9
<u>Transportation & communications</u>						
Nationals	122.2	51.1	6.0	181.7	43.7	6.8
Non-nationals	116.8	48.9	7.4	233.9	56.3	7.5
<u>Services</u>						
Nationals	543.7	54.3	26.7	832.7	44.3	31.0
Non-nationals	457.0	45.7	28.6	1 046.0	55.7	33.5
TOTAL						
Nationals	2 036.7	56.0	100.0	2 682.7	46.3	100.0
Non-nationals	1 600.8	44.0	100.0	3 113.7	53.7	100.0

Source: Sirageldin, Socknat, Birks, Li and Sinclair, 1983, p. 32.

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5. Largely because of the fall in prices, and reductions in the rate of production, the oil sector (including mining) fell from 62.7 per cent of GDP in 1975 to 58.2 per cent in 1980 and to 39.9 per cent by 1985.

6. Correspondingly, non-oil GDP increased its share in total output from 38.6 per cent in 1975 to 41.5 per cent in 1980, and to 60.2 per cent by 1985.

7. Similarly, domestic absorption (total consumption and investment) increased from 60.3 per cent of GDP in 1975 to 62.0 per cent in 1980 and was at 87.3 per cent by 1985.

There are major structural differences between the GCC and other Arab countries:

(a) As might be expected, the two groups of countries vary most with regard to the relative importance of agriculture and oil. These differences did not change significantly during the period under consideration, with agriculture in the GCC region averaging about 6 per cent of that in the non-GCC countries. Oil/mineral production was about 3.5-4.0 times higher in the GCC countries;

(b) Because of their rapid growth, services and distribution activities in the GCC countries rapidly approached the levels of relative importance achieved in the non-GCC group. In 1975, the service sector in the GCC group was about half the share of GDP as experienced outside the region. By 1985, it accounted for a slightly higher percentage than in the non-GCC countries. The gain of distribution activities was less dramatic, increasing from about 55 per cent of that achieved in the non-GCC countries in 1975 to 85 per cent in 1985;

(c) The relative importance of manufacturing in GDP did increase in the GCC countries during this period, but only marginally relative to progress outside the region. In 1975, manufacturing in the

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Table 4. ECONOMIC STRUCTURE: ARAB-WORLD COUNTRIES, 1975

(Percentage of gross domestic product)

COUNTRY	A g r i c u l t u r e	O i l & m i n i g	M a n u f a c t u r i n g	D i s t r i b u t i o n	S e r v i c e s	C o n s t r u c t i o n	N o n - o i l D P	A b s o l u t e
GCC								
<u>countries</u>								
UAE	0.8	67.1	0.9	15.6	4.5	10.9	32.9	54.6
Bahrain	1.6	27.8	23.0	24.1	17.8	5.4	72.2	78.8
Saudi Arabia	1.0	75.8	5.3	5.6	6.9	5.5	24.8	37.5
Oman	2.8	67.2	0.3	11.1	8.5	9.8	32.8	83.1
Qatar	0.7	68.2	2.6	12.8	7.4	7.8	31.8	36.6
Kuwait	0.3	70.4	5.7	9.1	12.1	6.0	37.3	71.2
AVERAGE	1.2	62.7	6.3	13.1	9.5	7.6	38.6	60.3
<u>Non-GCC</u>								
Iraq	7.3	56.9	5.9	12.3	13.5	2.2	na	na
Jordan	8.3	5.2	12.7	39.0	24.7	6.1	94.8	158.4
Libyan Arab Jamahiriya	2.2	51.9	2.3	13.2	15.7	11.5	48.2	89.7
PDRY	18.8	0.2	10.2	34.0	21.3	7.8	99.8	159.7
Yemen	41.1	0.7	5.3	28.1	11.6	4.8	99.3	133.8
Egypt	27.9	2.8	16.9	25.6	17.2	4.6	97.2	117.5
Algeria	8.8	28.0	10.1	20.0	12.9	11.7	72.0	111.8
Tunisia	18.2	9.6	8.8	23.9	18.8	7.1	90.4	104.8
Sudan	38.7	0.3	9.2	28.3	12.0	4.3	99.7	113.2
Syrian Arab Republic	17.9	na	20.2	41.0	16.3	4.6	na	112.5
Somalia	54.9	0.8	5.0	14.8	8.2	4.4	99.2	114.7
Morocco	17.4	9.1	16.6	23.9	24.0	6.5	90.9	109.6
Mauritania	24.9	19.5	4.4	15.6	21.7	5.4	80.5	125.5
Lebanon	9.2	na	16.6	38.7	24.9	4.0	na	117.4
AVERAGE	21.1	15.4	10.3	25.6	17.3	6.1	88.4	120.7
Ratio:								
GCC/Non-GCC	0.06	4.07	0.61	0.51	0.55	1.25	0.44	0.50

Source: Computed on the basis of data from the Arab Monetary Fund, National Income Accounts, 1974-1985.

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Table 5. ECONOMIC STRUCTURE: ARAB-WORLD COUNTRIES, 1980

(Percentage of gross domestic product)

COUNTRY	A g r i c u l t u r e	O i l & m i n i n g	M a n u f a c t u r i n g	D i s t r i b u t i o n	S e r v i c e s	C o n s t r u c t i o n	N o n - o i l G D P	A b s o l u t e
GCC								
<u>countries</u>								
UAE	0.8	64.4	3.8	16.0	6.4	9.0	35.6	56.6
Bahrain	1.0	30.5	14.7	29.3	16.8	6.9	69.5	79.0
Saudi Arabia	1.2	61.8	5.0	9.9	10.3	11.2	38.2	67.3
Oman	2.5	62.0	0.8	17.7	10.1	5.7	37.9	74.7
Qatar	0.5	67.2	3.3	11.9	11.4	5.4	32.8	40.0
Kuwait	0.2	65.2	5.7	12.2	12.1	3.7	34.7	53.6
AVERAGE	1.0	58.2	5.6	16.2	11.2	7.0	41.5	62.0
Non-GCC								
<u>countries</u>								
Iraq	4.7	61.0	4.5	13.5	7.8	7.2	39.0	68.1
Jordan	7.1	4.0	12.9	34.7	20.4	9.9	95.9	150.1
Libyan Arab Jamahiriya	1.5	62.7	2.3	9.7	11.3	8.6	37.2	68.3
PDRY	10.1	0.1	12.0	27.9	23.2	7.9	99.9	189.6
Yemen	28.1	1.2	5.7	26.0	16.2	8.7	98.9	164.8
Egypt	19.0	17.2	12.2	27.5	13.3	4.4	82.7	106.3
Algeria	6.7	32.0	9.9	19.0	12.5	13.2	68.0	96.5
Tunisia	14.0	12.1	11.8	22.1	19.1	5.9	87.9	105.4
Sudan	32.9	0.1	5.9	30.8	13.8	5.2	99.9	109.2
Syrian Arab Republic	20.2	na	16.3	38.1	18.4	7.0	na	117.2
Somalia	52.2	0.4	5.8	15.9	9.0	2.7	99.6	121.4
Morocco	18.1	4.9	17.1	23.5	26.1	6.8	95.1	110.1
Mauritania	21.7	12.7	5.8	18.9	26.2	7.3	87.3	132.3
Lebanon	8.5	na	13.0	47.6	35.8	3.4	na	127.6
AVERAGE	17.5	17.4	9.7	25.4	18.1	7.0	82.6	119.1
Ratio:								
GCC/Non-GCC	0.06	3.34	0.58	0.64	0.62	1.00	0.50	0.52

Source: Computed on the basis of data from the Arab Monetary Fund, National Income Accounts, 1974-1985.

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Table 6. ECONOMIC STRUCTURE: ARAB-WORLD COUNTRIES, 1985

(Percentage of gross domestic product)

COUNTRY	A g r i c u l t u r e	O i l & m i n e r a l r e s o u r c e s	M a n u f a c t u r i n g	D i s t r i b u t i o n	S e r v i c e s	C o n s t r u c t i o n	N o n - o i l G D P	A b s o l u t e
GCC								
<u>countries</u>								
UAE	1.4	45.3	9.3	22.3	13.1	8.9	54.7	72.0
Bahrain	1.1	18.1	11.3	35.3	23.1	9.6	81.9	96.8
Saudi Arabia	2.9	34.5	8.1	18.0	21.3	13.1	65.5	109.5
Oman	2.8	47.8	3.2	22.1	14.8	7.0	52.2	85.8
Qatar	1.0	43.2	7.1	16.2	25.7	6.1	56.8	59.3
Kuwait	0.5	50.2	6.2	17.0	19.7	3.4	49.8	100.6
AVERAGE	1.6	39.9	7.5	21.8	19.6	8.0	60.2	87.3
<u>Non-GCC</u>								
Iraq	14.0	23.3	9.6	27.2	17.6	9.3	76.6	115.4
Jordan	7.2	3.3	12.3	33.5	20.7	7.9	96.7	143.9
Libyan Arab Jamahiriya	3.6	36.1	4.8	15.7	21.9	11.6	63.9	86.2
PDRY	8.7	0.1	11.3	25.2	23.4	11.0	99.9	186.0
Yemen	33.9	1.0	7.0	23.4	16.4	6.5	99.0	135.7
Egypt	17.7	15.7	12.9	27.0	16.1	4.4	84.2	109.4
Algeria	8.3	22.1	10.6	21.2	13.3	14.8	77.9	97.4
Tunisia	15.2	10.2	12.6	23.7	18.7	5.7	89.8	107.2
Sudan	31.4	0.1	9.3	40.9	10.2	5.6	99.9	109.5
Syrian Arab Republic	21.8	n.a.	13.9	37.6	19.9	6.8	n.a.	110.9
Somalia	43.8	3.5	6.0	22.5	11.7	3.6	99.7	121.6
Morocco	18.4	4.7	16.6	22.9	27.0	6.5	95.3	108.3
Mauritania	30.7	11.2	5.2	21.9	11.2	6.3	88.7	133.4
Lebanon	8.8	n.a.	12.6	15.3	11.5	3.3	n.a.	183.4
AVERAGE	18.8	10.9	10.3	25.6	17.1	7.3	89.3	124.9
Ratio:								
GCC/Non-GCC	0.09	3.66	0.73	0.85	1.15	1.10	0.67	0.70

Source: Computed on the basis of data from the Arab Monetary Fund, National Income Accounts, 1974-1985.

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GCC countries was about 61 per cent of that in the non-GCC countries; by 1985 this figure had risen to 73 per cent.

In terms of individual Arab-world countries, the largest real gains in manufacturing were made by Algeria and Iraq, suggesting in the instance of Iraq the often observed boost to local manufacturing provided by war, inflation and the disruption of traditional supply lines. A constant price series for aggregate Arab-world GDP is not available, but during the 1970s it would most likely have shown a lesser role for the extractive industries, as did constant price data for individual oil-producing countries (Arab Banking Corporation, 1986).

In the 1980s, and especially since oil prices started to spiral downwards, a constant price series might be expected to show the extractive industries maintaining a large share of aggregate GDP, although inflation and disinflation in the non-oil sectors of economies like Saudi Arabia or the United Arab Emirates have tended to mirror oil price movements dictated by external markets, so limiting the extent of divergences (Arab Banking Corporation, 1986).

While manufacturing may have held its own on an aggregate Arab-world GDP basis, there have been important shifts within individual countries. Of the GCC countries, Oman, Qatar and the United Arab Emirates have experienced substantial expansion of their manufacturing sectors' share of GDP. Bahrain was already significantly industrialized by 1973 as a result of several major ventures; since the late 1970s, however, the expansion of the banking sector has reduced manufacturing's importance, although value-added at current prices has continued to rise.

In Saudi Arabia, the dramatic swelling of the construction sector has masked, in relative terms, a steady expansion of the manufacturing sector, and the situation is somewhat similar in Kuwait, although the commitment to domestically-based

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manufacturing has been partially challenged by successful government investment in overseas industry, by a slow-down in local and Iraqi markets, and by a shortage of non-associated natural gas.

These concerns aside, a major problem involved in using the sectoral share of total GDP for assessing progress towards diversification is the simple fact that increases in, for example, manufacturing will show up as simply owing to declining oil revenues. Few would argue that this phenomenon would represent permanent progress towards a more balanced economic structure. To avoid this problem, an assessment of the region's changing economic structure can be obtained by using non-oil gross domestic product as the basis for computing sectoral shares.

The results of this analysis (tables 7-9) again show some distinctive patterns:

1. Interestingly enough, in 1975 the GCC countries had considerably higher shares of manufacturing--nearly 1.5 times that of the non-GCC Arab countries. This superiority gradually declined over time, however, so that by 1985 the two groups had nearly equal shares of manufacturing in non-oil GDP.

2. As part of this process, the shares of manufacturing in non-oil GDP fell from 15.4 per cent in 1975 to 12.4 per cent by 1985. Given the fact that the share of manufacturing in non-GCC countries stabilized at around 10.5 to 11.0 per cent, it is apparent that most of the relative decline in the gap between GCC and non-GCC countries was due to sub-par performance on the part of the GCC countries.

3. In terms of the GCC countries, the United Arab Emirates had the biggest gain in industrial diversification, followed by Qatar and Oman. The other GCC countries experienced declines in their share of manufacturing in non-oil GDP.

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4. On the other hand, the shares of both services and distribution in the GCC countries were not only higher in 1975, but increased throughout the period under consideration. Bahrain and Oman registered the greatest gains in distribution, while Qatar had by far the largest increase in services.

5. As might be imagined, construction activity declined in the GCC countries as a whole over the period 1975-85. Saudi Arabia, however, experienced a gain during this period, increasing its share of construction from 22.2 per cent in 1975 to 29.3 per cent by 1985. Smaller gains were experienced by Bahrain and Qatar. On the other hand, the United Arab Emirates, Oman and Qatar experienced a significant contraction in construction activity.

6. Another measure of diversification, the share of imports in non-oil GDP, also experienced several significant trends during this period. At the beginning of the period, the GCC countries had about 1.7 times the volume of imports relative to the non-GCC countries. By the end of the period, 1985, this ratio had dropped to 1.35. The United Arab Emirates, Bahrain, Oman and Qatar all experienced considerable reduction in imports, while Saudi Arabia and to a lesser extent Kuwait, saw this figure increase.

7. Similar patterns characterize absorption--total expenditures on consumption and investment. Here, for the GCC countries, the ratio of absorption to non-oil GDP declined from 172.6 in 1975 to 147.9. These gains were not evenly distributed, however, with Oman experiencing the greatest decline followed by the United Arab Emirates, Kuwait and Qatar. Again in contrast, Saudi Arabia--and to a lesser extent Bahrain--experienced a fairly sizeable increase in absorption during this period.

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Table 7. ECONOMIC STRUCTURE: ARAB-WORLD COUNTRIES, 1975

(Percentage of non-oil gross domestic product)

COUNTRY	A g r i c u l t u r e	O i l & m i n i t i a l g e	M a n u f a c t u r i n g	D i s t r i b u t i o n	S e r v i c e s	C o n s t r u c t i o n	I m p o r t s	A b s o l u t e
GCC countries								
UAE	2.5	203.6	2.8	47.5	13.7	33.1	86.6	165.7
Bahrain	2.2	38.5	31.9	33.4	24.7	7.5	151.0	109.1
Saudi Arabia	4.0	303.5	21.3	23.8	28.0	22.2	78.7	151.3
Oman	8.5	205.1	8.8	34.2	26.9	29.8	154.7	253.6
Qatar	2.2	214.2	8.1	40.3	23.3	24.4	51.7	114.9
Kuwait	0.9	238.4	19.2	30.7	40.8	7.1	88.0	241.1
AVERAGE	3.4	200.6	15.4	35.0	26.2	20.7	101.8	172.6
Non-GCC								
Iraq	17.1	131.9	13.7	28.4	31.4	5.3	103.3	n.a.
Jordan	8.7	5.5	13.4	41.1	26.0	6.5	101.8	167.1
Libyan Arab Jamahiriya	4.6	107.8	4.7	27.4	32.6	23.9	71.61	86.5
PDRY	18.9	0.2	10.2	34.0	21.3	7.8	79.3	106.0
Yemen	41.4	0.7	5.3	28.3	11.6	4.9	38.41	34.7
Egypt	28.8	2.9	17.4	26.3	17.6	4.8	37.0	121.0
Algeria	12.2	39.0	14.1	27.8	17.9	14.8	64.9	155.4
Tunisia	20.1	10.7	9.8	26.7	20.8	16.3	40.0	116.0
Sudan	38.9	3.1	9.2	28.3	12.0	7.9	24.7	113.6
Syrian Arab Republic	n.a.	n.a.	n.a.	n.a.	n.a.	4.3	n.a.	n.a.
Somalia	55.3	3.5	5.0	15.0	8.2	4.4	27.6	115.6
Morocco	19.1	4.7	18.2	26.3	26.4	7.2	36.0	120.5
Mauritania	31.0	11.2	5.5	19.3	27.0	6.7	79.9	156.0
Lebanon	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
AVERAGE	24.7	26.8	10.5	27.4	21.1	8.8	60.4	124.4
Ratio:								
GCC/Non-GCC	0.14	7.49	1.47	1.28	1.24	2.35	1.69	1.39

Source: Computed on the basis of data from the Arab Monetary Fund, National Income Accounts, 1974-1985.

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Table 8. ECONOMIC STRUCTURE: ARAB-WORLD COUNTRIES, 1980

(Percentage of non-oil gross domestic product)

COUNTRY	A g r i c u l t u r e	O i l & m i n i n g	M a n u f a c t u r i n g	D i s t r i b u t i o n	S e r v i c e s	C o n s t r u c t i o n	I m p o r t s	A b s o l u t e
GCC								
<u>countries</u>								
UAE	2.1	181.1	10.7	44.9	17.9	25.1	96.9	159.0
Bahrain	1.5	43.8	21.1	42.0	24.1	9.9	132.4	113.7
Saudi Arabia	3.2	162.0	13.1	25.8	26.9	29.3	89.9	176.4
Oman	6.7	163.5	2.0	46.6	26.5	15.0	98.6	196.9
Qatar	1.6	205.0	10.0	36.1	34.9	16.6	63.4	124.6
Kuwait	0.5	187.6	16.3	35.0	34.7	10.7	98.5	154.2
AVERAGE	2.6	157.2	12.2	38.4	27.5	17.8	96.6	154.1
Non-GCC								
Iraq	12.0	156.2	11.4	34.4	20.0	18.4	80.6	174.7
Jordan	7.3	4.2	13.5	36.1	21.2	10.3	101.8	156.4
Libyan Arab Jamahiriya	4.1	168.4	6.1	26.1	30.2	23.1	86.6	183.4
PDRY	10.2	0.1	12.0	27.9	23.3	7.9	104.2	189.8
Yemen	28.5	1.2	5.8	26.3	16.4	8.8	71.9	166.8
Egypt	22.9	20.8	14.8	33.2	16.1	5.3	55.9	128.4
Algeria	9.9	47.1	14.6	28.0	18.4	19.4	44.9	142.1
Tunisia	15.9	13.7	13.5	25.1	21.7	6.7	52.3	119.8
Sudan	32.9	0.1	5.9	30.8	13.8	5.2	24.4	109.3
Syrian Arab Republic	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Somalia	52.3	3.8	5.7	16.0	9.1	2.7	30.1	121.8
Morocco	19.0	5.1	18.0	24.7	27.4	7.3	30.4	115.8
Mauritania	24.8	14.5	6.7	21.7	20.0	8.4	70.4	151.6
Lebanon	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
AVERAGE	20.0	36.3	10.7	27.5	19.8	10.3	62.8	146.7
Ratio:								
GCC/Non-GCC	0.13	4.33	1.14	1.40	1.39	1.73	1.54	1.05

Source: Computed on the basis of data from the Arab Monetary Fund, National Income Accounts, 1974-1985.

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Table 9. ECONOMIC STRUCTURE: ARAB-WORLD COUNTRIES, 1985

(Percentage of non-oil gross domestic product)

COUNTRY	A g r i c u l t u r e	O i & m i n u s t r i c t i o n g	M a n u f a c t u r i n g	D i s t r i b u t i o n	S e r v i c e s	C o n s t r u c t i o n	I m p o r t s	A b s o l u t e
GCC countries								
UAE	2.6	82.7	17.0	44.9	17.9	25.1	56.0	131.6
Bahrain	1.2	22.0	13.9	42.0	24.1	9.9	84.7	118.1
Saudi Arabia	4.4	52.7	12.3	25.8	26.9	29.3	74.8	167.2
Oman	5.4	91.3	6.1	46.6	26.5	15.0	69.1	164.2
Qatar	1.7	75.9	12.5	36.1	34.9	16.6	35.2	104.3
Kuwait	1.0	100.8	12.4	35.0	34.7	10.7	96.9	202.1
AVERAGE	2.7	70.9	12.4	38.4	27.5	17.8	69.5	147.9
Non-GCC								
Iraq	18.3	30.4	12.6	34.4	20.0	18.4	49.7	150.5
Jordan	7.4	3.3	12.8	36.1	21.2	10.3	96.5	148.8
Libyan Arab Jamahiriya	5.6	56.5	7.4	26.1	30.2	23.1	36.2	134.9
PDRY	8.7	0.1	11.3	27.9	23.3	7.9	97.2	187.1
Yemen	34.2	1.0	7.1	26.3	16.4	8.8	41.0	137.1
Egypt	21.0	18.7	15.3	33.2	16.1	5.3	34.7	129.8
Algeria	10.7	28.4	13.5	28.0	18.4	19.4	27.7	125.1
Tunisia	16.9	11.3	13.4	25.1	21.7	6.7	45.1	119.3
Sudan	31.4	0.1	9.3	30.8	13.8	5.2	20.3	109.6
Syrian Arab Republic	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Somalia	43.9	3.5	6.0	16.0	9.1	2.7	30.6	122.0
Morocco	19.3	4.9	17.4	24.7	27.4	7.3	36.7	113.7
Mauritania	34.6	12.6	5.8	21.7	20.0	8.4	101.8	150.2
Lebanon	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
AVERAGE	21.0	14.2	11.0	27.5	19.8	10.3	51.5	135.7
Ratio:								
GCC/Non-GCC	0.13	4.99	1.13	1.40	1.39	1.73	1.35	1.09

Source: Computed on the basis of data from the Arab Monetary Fund, National Income Accounts, 1974-1985.

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Method of Analysis

To assess the role both the foreign and domestic workforces played in facilitating these structural changes, the sectoral patterns of production of the 20 members of the Arab Monetary Fund were factor-analysed¹ for the years 1975, 1980 and 1985. Changes in the associated country factor scores (with and without foreign labour) were then used to assess the relative sectoral impacts made by expatriate workers.

For purposes of analysis, a four-factor analysis was used, with the major dimensions in the data consisting of the value-added sectoral output of manufacturing, construction, oil/minerals, distribution, and services.² To avoid the problems mentioned above of using either GDP or non-oil GDP to determine structural change over time, each of the major sectors was represented twice: as a percentage of non-oil GDP and as a percentage of absorption (total expenditures). Total non-oil GDP as a percentage of domestic absorption (expenditures) was also added to the analysis to determine the relative impact of the domestic/foreign workforce components on the labour-importing countries.

Finally, there is no question that appreciation of the exchange rate has played a role in affecting the differential expansion of sectoral output.³ For

¹ See Rummel, 1970 for a description of this method. Computations were made using the Statistical Analysis System (SAS Institute, 1985).

² Since the construction sector was closely associated with oil, two separate runs were performed, each of these sectors being individually factor-analysed with imports, manufacturing, distribution and services.

³ For an analysis of this problem in the context of the Gulf States see Looney, 1988-1989, pp. 23-39 and Al Sabah, 1988.

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example, during the period 1970-1981, the Kuwaiti dinar appreciated from 292 (1975 = 100) to 69, while both the agricultural and manufacturing sectors' output expanded at about one half the rate of non-tradeables (table 10). Similar movements characterized the Saudi Arabian economy.

Table 10. DUTCH DISEASE* INDICATORS

	Oil shock a/ percentage		Real exchange rate b/ (1975=100)			Sector growth c/ (1970-1981) (% per annum)		
	1970- 1975	1975- 1980	1970	1978	1981	Avg.	Manu.	Non- trade
Kuwait	544	168	292	104	69	5.3	6.7	15.8
Saudi Arabia	183	71	167	119	86	6.1	9.5	9.7
Nigeria	73	46	117	121	89	-0.3	11.7	9.1
Mexico	146	20	83	124	89	3.7	7.1	6.8
Indonesia	1	60	118	117	106	4.0	13.4	10.1
Venezuela	48	34	97	103	76	2.7	4.7	5.5

Source: Based on Roemer, 1985, table 11.3, p. 243.

* The decrease in the amount of investment resources set aside for non-oil sectors when there is a quick increase in oil prices.

Notes: a/ Oil shock = investment in nominal value of petroleum exports divided by gross domestic product at the beginning of each period.

b/ Real exchange rate = index of local currency-to-dollar rate divided by the implicit GDP deflator and multiplied by an index of import prices (a decrease in the index represents a real appreciation).

c/ Non-tradeables = construction, utilities, transport and communications, public administration and defence and other services.

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Results

Several patterns were identified in the factor analysis:

1. Not surprisingly, at the beginning of the period under consideration, the foreign labour force was largely correlated with developments in the oil and construction sectors (table 11). Its impact on other sectors appears marginal at this time.

2. The national labour force was not strongly correlated with output in any particular sector.

3. On a relative basis, Kuwait and Saudi Arabia would have experienced major declines in construction activity without the presence of foreign workers. No doubt the other GCC countries would have had their construction activity reduced in the absence of foreign workers, but these declines are minor relative to Saudi Arabia and Kuwait.

By 1980, the situation had not changed appreciably (table 12):

1. The foreign labour force was still largely associated with developments in the construction sector. Again Kuwait and Saudi Arabia would have had the greatest declines in construction activity with the exodus of foreign workers.

2. The national workforce was now largely (albeit weakly) associated with developments in manufacturing. This relationship was not particularly strong, however, with manufacturing more correlated with appreciation in the exchange rate than with the overall size of the domestic workforce.

Several changes had occurred by 1985 (table 13):

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1. While the foreign workforce was still largely associated with the construction sector, this linkage appeared to be weakening. At this time the United Arab Emirates, Saudi Arabia and Kuwait were most affected by the presence of foreign workers.

2. In contrast, the national workforce was still most closely associated with developments in the manufacturing sector.

While the relationship between the overall structure of a given economy and the composition of its workforce (relative proportions of local and foreign workers) is interesting, the economic structure (as defined here) moves fairly slowly over time. A more precise means of identifying changing patterns of sectoral output associated with movements in the size and composition of the workforce is to examine movements over the two five-year sub-periods, 1975-80 and 1980-85. Here, the focus is on determining the contribution additional foreign and domestic workers made to the relative expansion of the major sectors of the economy. Because the oil sector hires a relatively small number of workers, the agricultural sector was substituted in the analysis that follows.

Several interesting patterns were identified (tables 14, 15):

1. As was the case for the various individual years during the period 1975-80 (table 14) changes in the foreign workforce were largely associated with the expansion of the construction sector. However, manufacturing output was also significantly affected by the relative increase in the number of foreign workers. The relative increase of manufacturing activity over this period was 0.51.

2. In contrast, there was little relationship between the relative expansion in domestic workers and the manufacturing sector. Instead, the major

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Table 11. MANPOWER IMPACTS ON ARAB-WORLD ECONOMIC
STRUCTURES: SIZE EFFECTS, 1975
(Standardized regression coefficients)

	Factor 1 Oil con- struction	Factor 2 Manufac- turing	Factor 3 Non-oil GDP	Factor 4 Distribu- tion
Oil/absorption	0.90*	0.17	-0.05	-0.17
Foreign labour force	0.87*	0.10	-0.27	-0.31
Oil/GDP	0.80*	0.06	-0.32	0.12
Construction/ absorption	0.79*	-0.09	0.25	0.38
Construction/GDP	0.70*	-0.30	-0.06	0.31
Dutch disease	-0.84*	0.08	-0.43	0.41
Services/absorption	0.10	0.92*	-0.07	0.11
Manufacturing/GDP	-0.03	0.89*	-0.02	-0.17
Manufacturing/ absorption	-0.04	0.87*	0.25	-0.12
Non-oil GDP/ absorption	-0.02	0.39	0.85*	-0.10
Distribution/ absorption	0.00	0.26	0.80*	0.60*
Services/GDP	0.06	0.52*	-0.83*	0.10
Distribution/GDP	-0.03	-0.15	0.15	0.91*
Nat'l labour force	-0.21	0.00	0.28	-0.58*

(Factor scores)

Gulf economies				
UAE	1.19/(1.34 +)	-1.41	-0.49	1.76
Bahrain	-0.45/(-0.40 =)	2.31	0.80	0.47
Saudi Arabia	2.46/(2.03 -)	0.78	-0.49	-1.43
Oman	0.56/(0.71 +)	-1.40	1.29	0.53
Qatar	1.21/(1.64 +)	0.38	0.90	1.85
Kuwait	-0.04/(-0.16 -)	0.67	-2.31	0.13
Iraq	n.a.	n.a.	n.a.	n.a.
Other Arab economies				
Jordan	-0.92/(-0.87 -)	0.10	-0.31	0.94
Libyan Arab Jamahiriya	0.52/(0.40 -)	-0.38	-1.24	-0.01
PDRY	-0.74/(-0.71 =)	-0.40	-0.10	0.18
Yemen	-0.78/(-0.83 =)	-1.10	0.54	-0.51
Egypt	-1.06/(-1.20 -)	0.32	0.73	-1.25
Algeria	-0.30/(-0.26 =)	-0.46	0.10	-0.50
Tunisia	-0.49/(-0.46 =)	0.13	0.54	-0.43
Sudan	-0.40/(-0.44 =)	-0.62	1.49	-1.18
Morocco	-0.77/(-0.79 =)	1.07	0.17	-0.54

Source Based on Roemer, 1985, table 11.3, p. 243.

Notes: Results based on oblique factor-analysis rotation.
Employment figures are in terms of share of Arab-world endowment.
Dutch disease is the appreciation in real exchange rate relative to
1974. GDP = non-oil gross domestic product.

() Effect of removing foreign workforce.

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Table 12. MANPOWER IMPACTS ON ARAB-WORLD ECONOMIC STRUCTURES:
SIZE EFFECTS, 1980

(Standardized regression coefficients)

	Factor 1 Oil con- struction	Factor 2 Manufac- turing	Factor 3 Services	Factor 4 Distribu- tion
Construction/GDP	0.95*	-0.14	-0.11	-0.05
Construction/ absorption	0.94*	0.07	-0.07	0.05
Foreign labour force	0.87*	0.11	0.00	-0.29
Oil/GDP	0.76*	-0.11	0.22	0.27
Oil/absorption	0.71*	0.00	0.29	0.31
Manufacturing/ absorption	-0.03	0.94*	0.03	-0.01
Manufacturing/GDP	0.14	0.91*	-0.01	-0.14
Non-oil GDP/ absorption	-0.32	0.68*	-0.01	0.20
Dutch disease	0.09	0.61*	-0.62*	0.17
Services/GDP	0.19	0.20	0.85*	-0.15
Services/absorption	-0.03	0.61*	0.76*	0.00
National Work-Force	0.10	0.46	-0.74*	-0.12
Distribution/GDP	0.12	-0.18	-0.06	0.94*
Distribution/abs- absorption	-0.11	0.38	-0.03	0.84*
(Factor scores)				
Gulf economies				
UAE	1.38/(1.47 =)	-0.48	-0.57	1.53
Bahrain	-0.53/(-0.51 =)	1.61	0.69	1.54
Saudi Arabia	2.07/(1.66 -)	-0.27	0.25	-1.47
Oman	0.20/(0.31 +)	-1.69	0.49	1.31
Qatar	0.75/(1.04 +)	0.40	2.09	1.23
Kuwait	0.63/(0.41 -)	0.73	1.31	0.21
Iraq	0.54/(0.75 +)	-0.65	-0.42	0.06
Other Arab economies				
Jordan	-0.72/(-0.73 =)	-0.21	-0.15	0.11
Libyan Arab Jamahiriya	1.08/(1.07 =)	-1.00	0.74	-0.98
PDRY	-0.89/(-0.95 =)	-0.77	0.06	-1.12
Yemen	-0.92/(-0.97)	-1.28	-0.55	-0.94
Egypt	-0.77/(-0.79 =)	1.22	-2.25	0.19
Algeria	0.25/(0.42 +)	0.20	-0.80	-0.62
Tunisia	-0.94/(-0.98 =)	0.72	-0.14	-0.59
Sudan	-1.26/(-1.35 =)	-0.21	-0.97	0.41
Morocco	-0.85/(-0.86 +)	1.65	0.22	-0.78

Source: Based on Roemer, 1985, table 11.3, p. 243.

Notes: Results based on oblique factor-analysis rotation.
Employment figures are in terms of share of Arab-world endowment.
Dutch disease is the appreciation in real exchange rate relative to 1974. GDP = non-oil gross domestic product.
() Effect of removing foreign workforce.

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Table 13. MANPOWER IMPACTS ON ARAB-WORLD ECONOMIC STRUCTURES:
SIZE EFFECTS, 1985

(Standardized regression coefficients)

	Factor 1 Services/ Oil	Factor 2 Manufac- turing	Factor 3 Contruc- tion	Factor 4 Distribu- tion
Services/GDP	0.99*	0.00	-0.10	-0.25
Oil/GDP	0.90*	0.37	-0.08	-0.09
Oil/absorption	0.82*	-0.07	0.17	0.21
Services absorption	0.78*	-0.24	0.10	0.16
Manufacturing/ absorption	0.05	0.99*	0.07	0.08
Manufacturing/GDP	0.03	0.84*	0.12	-0.09
Non-oil GDP/ absorption	0.00	0.71*	-0.01	0.33
Dutch Disease	-0.04	0.71*	-0.21	-0.15
Nat'l Work Force	-0.43	0.44	-0.02	-0.09
Construction/GDP	-0.04	-0.07	0.99*	-0.05
Construction/ absorption	0.00	0.19	0.96*	0.08
Foreign labour force	0.08	-0.09	0.74*	-0.23
Distribution/ absorption	-0.04	0.27	-0.03	0.92*
Distribution/GD	0.03	-0.20	-0.08	0.91*

(Factor scores)

Gulf economies				
UAE	0.72	0.69	1.29/(1.13 -)	1.31
Bahrain	0.20	0.55	0.12/(0.43 +)	1.68
Saudi Arabia	0.44	-0.50	1.97/(1.17 -)	1.17
Oman	0.73	-1.74	0.25/(0.24 =)	1.11
Qatar	2.36	0.81	0.11/(0.54 +)	0.32
Kuwait	1.28	-0.91	-0.83/(-1.33 -)	-0.59
Iraq	-0.40	-0.35	0.12/(0.17 +)	0.23
Other Arab economies				
Jordan	-0.66	-0.20	-0.60/(-0.71)	-0.03
Libyan Arab Jamahiriya	0.81	-0.87	1.34/(1.42)	-0.70
PDRY	-0.74	-1.03	-0.42/(-0.36)	-1.30
Yemen	-1.00	-0.98	-0.92/(-0.78)	-0.85
Egypt	-0.94	0.92	-0.98/(-1.03)	-0.06
Algeria	-0.67	0.45	1.36/(1.79)	-0.11
Tunisia	-0.50	0.87	-0.95/(-0.94)	-0.52
Sudan	-0.41	0.13	-0.93/(-0.79)	1.73
Morocco	-0.20	2.16	-0.94/(-0.96)	-0.06

Source: Based on Roemer, 1985, table 11.3, p. 243.

Notes: Results based on oblique factor-analysis rotation.
Employment figures are in terms of share of Arab-world endowment.
Dutch disease is the appreciation in real exchange rate relative to 1974. GDP = non-oil gross domestic product.
() Effect of removing foreign workforce.

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Table 14. MANPOWER IMPACTS ON ARAB-WORLD ECONOMIC STRUCTURES:
SIZE EFFECTS, 1975-1980

(Standardized regression coefficients)

	Factor 1 Construc- tion	Factor 2 Manufac- turing	Factor 3 Distribu- tion	Factor 4 Agricul- ture
Construction/ absorption	0.91*	-0.22	0.06*	-0.13
Construction/GDP	0.80*	-0.38*	-0.27	-0.11
Foreign labour force	0.79*	0.51*	0.12	-0.08
Services/GDP	-0.74*	0.18	-0.16	-0.30
Manufacturing/ absorption	0.05	0.90*	-0.43	0.06
Services/absorption	-0.27	0.82*	0.25	-0.20
Manufacturing/GDP	-0.24	0.71*	-0.53*	0.03
Non-oil GDP/ absorption	0.33	0.57*	0.46	0.24
Distribution/GDP	-0.14	-0.25	0.97*	-0.09
Distribution/ absorption	0.15	0.06	0.91*	0.05
Agriculture/GDP	-0.13	-0.07	0.09	0.94*
Agriculture/ absorption	-0.14*	-0.03	0.13	0.91*
National workforce	0.25	0.02	-0.32	0.64*

Omitting domestic workforce

	Construc- tion	Manufac- turing	Distribu- tion	Agricul- ture
Foreign labour force	0.81*	0.47	0.11	-0.12

Omitting foreign workforce

Domestic labour force	0.27	-0.22	0.12	0.62
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Source: Based on Roemer, 1985, table 11.3, p. 243.

Notes: Results based on oblique factor-analysis rotation. Employment figures are in terms of share of Arab-world endowment. All variables reflect changes over the 1975-80 period. GDP = non-oil gross domestic product.

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Table 15. MANPOWER IMPACTS ON ARAB WORLD-ECONOMIC STRUCTURES:
SIZE EFFECTS, 1980-1985

(Standardized regression coefficients)

	Factor 1 Manufac- turing	Factor 2 Construc- tion	Factor 3 Distribu- tion	Factor 4 Agricul- ture
Manufacturing/ absorption	0.93*	-0.22	0.12	-0.12
Non-oil GDP/ absorption	0.81*	0.00	-0.27	0.22
Manufacturing/GDP	0.79*	- 0.08	-0.07	-0.17
Foreign labour force	0.74*	0.35	-0.09	0.05
Distribution/ absorption	0.74*	0.16	0.64*	0.07
Construction/ absorption	0.15	0.97*	-0.19*	-0.09
Construction/GDP	-0.23	0.88*	-0.11	-0.19
Services/GDP	-0.10	-0.75*	-0.44	-0.11
Distribution/GDP	-0.09	0.15	0.88*	0.01
Services/absorption	0.45	-0.41	-0.50	-0.05
National work force	0.06	0.39	-0.86*	0.13
Agriculture/GDP	-0.09	-0.16	0.01	0.99*
Agriculture/ absorption	-0.02	-0.02	0.08	0.98*

Omitting domestic workforce

	Manufac- turing	Distribu- tion	Contruc- tion	Agricul- ture
Foreign labour force	0.74*	0.01	0.31	0.05

Omitting foreign workforce

Domestic labour force	0.03	-0.86	0.37	0.14
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Source: Based on Roemer, 1985, table 11.3, p. 243.

Notes: Results based on oblique factor-analysis rotation. Employment figures are in terms of share of Arab-world endowment. All variables reflect changes over the period 1980-85. GDP = non-oil gross domestic product.

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contribution to output made by the relative expansion of domestic workers was in agriculture. This finding is somewhat surprising in light of the overall low contribution of agriculture to the economies of the labour importers.

3. Both of these results hold when rerunning the analysis with only one type of labour retained in the analysis (bottom of table 14).

For the latter period, 1980-85:

1. Over the period 1980-85 (table 15) the foreign workforce was largely responsible for the expansion of manufacturing--its contribution to construction had declined to the extent that the national labour force was of approximately equal importance in affecting output in that sector.

2. In contrast, movements in the domestic labour force were largely responsible for the expansion in services activities during this period. Its contribution to agriculture had fallen significantly and was no longer a major factor in affecting increases in output in that sector.

3. As with the earlier period, both of these patterns hold when the model is rerun omitting the other labour variable (bottom of table 15).

CONCLUSIONS

The major finding in the above analysis was the shifting importance of the foreign workforce in affecting structural change in the oil countries.

In earlier years, this change was dominated by developments in the construction sector. In fact, construction activity was so extensive in the labour-importing countries that it tended to mask the beginning of other perhaps more important structural changes beginning to take place.

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In recent years, these changes have revolved around a rapidly growing services sector, largely manned by domestic workers, and a manufacturing sector almost totally dependent on foreign workers for its expansion relative to other sectors. There is little evidence from the results presented here that the manufacturing sector will be able to expand its relative role in these economies without the continuation of significant inflows of foreign workers.

This fact may have important implications for future growth in the region. Saudi Arabia, for example, now employs about 100,000 Europeans and North Americans in managerial and technical jobs. However, this source may be endangered by the demographic trends in the industrial countries. It is anticipated, for example, that the number of young people entering the West European labour market will fall by 25 per cent. The result will be a growing shortage of appropriately qualified people, particularly in the skilled managerial and industrial areas essential for modern industry but critically lacking in the Kingdom.

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BOOK REVIEWS

Development of Geographical Distribution of Population in Kuwait, 1970-1985. An analytical comparative study. By Amal Yousif Al-Sabah, Kuwait, Maqhaw Press, 1987. (In Arabic.)

This analytical comparative study of the geographical distribution of population in Kuwait relies on data of censuses conducted in Kuwait for the years 1970, 1975, 1980 and 1985.¹

The pattern of the geographical distribution of population in Kuwait during the 15 years between 1970 and 1985 underwent rapid and radical changes which covered mainly the Kuwaiti and non-Kuwaiti groups of this population. According to the 1985 census, non-Kuwaitis constituted 59.9 per cent of total population in Kuwait; this proportion created a distinctive pattern of population distribution with immigration playing a major role. In fact immigration has created an almost unique geographical distribution of population, as there are areas predominantly Kuwaiti and others predominantly non-Kuwaiti. This distribution pattern came about as a result of the State's constructional policy, which allocated model residential areas for the Kuwaiti population and others for non-Kuwaitis.

The introduction of the paper reviewed the steps of this development in the geographical distribution of population during the period 1970 to 1985.

The study comprises three chapters. Chapter I examines the relative distribution of population around two focal points. The first studies the proportion of concentration of Kuwaitis and non-Kuwaitis out of the total population in each residential area individually in order to identify the areas in which the Kuwaiti character

¹ Data of the 1985 census were projected from preliminary results.

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predominates and those in which the non-Kuwaiti character predominates. The second focal point investigates the residential areas in the country which Kuwaitis or non-Kuwaitis prefer for settlement.

Chapter II is a comparative analysis of population density of the country's areas and the development of this density from one census to another in the four above-mentioned censuses. This chapter also discusses factors affecting the development of population density of Kuwaitis and non-Kuwaitis from one census to another in respect of the total population.

Chapter III presents a detailed review of the particulars of each project embodied in the third five-year plan for housing and population distribution with special reference to the number of housing units and their capacity for population accommodation. The chapter also investigates trends in constructional and population expansion on the country's constructional and population map for 1991-1992.

The research is a contribution to the field of analysis and comparison of data provided by censuses in Kuwait. As such, it is useful to researchers, planners and persons concerned with formulation of economic and social policies, particularly from the point of view of utility and services distribution in Kuwait.

Arab Population Science until Ibn Khaldoun. By Mustafa Al-Alwani. Published by the Ministry of Culture of the Syrian Arab Republic, Damascus, 1989. (In Arabic.)

This research examines the writings by Ibn Khaldoun that exhibit demographic features; most of those who wrote about him indicated his interest in this area and referred to the population survey he carried out in his investigation of the statement

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reported by Al-Mas'oudi about the number of the Israelites who had been lost in the wilderness. If, however, the subject of population was passed over briefly, it was simply because these writers did not treat it as a main issue.

This research is based on a study of Ibn Khaldoun's "Introduction" extracting any texts on demographic aspects. It then focuses on population distribution aspects as manifested in various topics discussed by Ibn Khaldoun.

The introduction of the present research refers to some writings of Arab encyclopedists who touched directly or indirectly on this topic, such as Al-Jahidh's "Animals", Ikhwan-Al-Safa's "Epistles", Al-Mas'oudi's "Meadows of Gold", Ibn Hayyan Al-Tawhidi's "To Delight and Be Friendly" and others. Some significant texts are revealed, which in some ways provide insight into this aspect. The introduction also gives concise summaries of translated texts by contemporary writers on population distribution science which delineate the nature, characteristics and topics of this science. The introduction is thus a general outline of the scope this science has attained in present times so that a comparison can be made between now and what the Arabs knew hundreds of years ago.

Two chapters follow: the first deals with statistics among the Arabs, and the second focuses on Al-Haj (pilgrimage) and Al-Hejra (emigration), explaining the role of the Arabs and of Ibn Khaldoun personally in this respect, as new ideas have been put forward by a contemporary Arab scholar about Al-Haj and its place in Al-Hejra.

Finally the book presents an argument about "Ilm Ul-Imran" (the science of human settlement)--an appellation used by Ibn Khaldoun--and the various definitions elaborated by scholars of this science. The book seeks to determine the relationship of this science to that of population and explains that the

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"science of human settlement" comes very close to the science of social and economic development, which is considered as a modern science.

The treatment of material contained in the book was confined to documentation. The ideas presented may, however, assume wider and more profound dimensions in the future when research and closer scrutiny into literature would reveal more highly developed texts and richer material.

Studies and Research on Population Issues. Ministry of Labour, Population Education Unit in Jordan in collaboration with the International Labour Office, and the United Nations Fund for Population Activities (UNFPA). By Saleh Al-Khasawne and Mahmoud Fadheel Al-Tal, 1989. p. 261. (In Arabic.)

This book is the fourth in a series of publications and documents issued by the Publication Education Unit Project in the Jordanian Ministry of Labour. The project illustrates a joint effort by the Ministry of Labour and each of the International Labour Office and the United Nations Fund for Population Activities (UNFPA).

The book embodies a set of studies and research papers presented as part of population education activities undertaken in various areas in Jordan. Publishing them in book form enriches population education and is consistent with the requirement of overall and integrated development which relies on such education as a tool and base.

The book is an example of the importance of population education and its bearing on the various aspects of the life of the people. It treats such topics as: the labour market in Jordan; socio-economic obstacles to the well-being of Arab households; the relationship of population and labour force with development planning in the Arab countries; the role of Arab women in socio-economic

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development; health education and population in the Arab countries; Islam and family planning; socio-economic implications of population increase and factors leading to this increase; the impact of development plans on the economy and population in Jordan; and the importance of the role of rural development in the service of society in addition to the efforts of the International Labour Organisation in the field of population education.

The reader will find everything he wishes to know about the origin, goals, development stages, aspirations and achievements of the Population Education Unit Project.

The book is a valuable scientific reference for research workers and scholars concerned with population studies and issues.

ANNOUNCEMENTS

Popline on CD-ROM

Popline, the world's largest bibliographic database on population, for which the ESCAP Regional Information Centre is the focal point in the Asian and Pacific region, is now available on compact disc, read-only memory (CD-ROM). The CD-ROM version is funded by the United Nations Population Fund (UNFPA).

Maintained by the Population Information Programme at the Johns Hopkins University, the Center for Population and Family Health at Columbia University, the Population Index at Princeton University, and the Carolina Population Center at the University of North Carolina at Chapel Hill, Popline receives most of its funding from the United States Agency for International Development (USAID) and the U.S. National Institute of Child Health and Human Development.

Popline contains more than 160,000 citations from worldwide literature on population, family planning and related health care, law and policy issues. Around 30 per cent of the records represent unpublished documents which would otherwise be difficult to obtain. While the majority of items date from 1970 onwards, some sources were published as early as 1886.

All records are in English, although some 10 per cent of the sources are in other languages. The Popline Thesaurus, included as part of the CD-ROM product, provides specific subject indexing and serves as a guide to retrieving document records.

The entire Popline database has been fitted onto one disc, which will be distributed commercially at a cost of \$US 825 in countries outside North America.

With UNFPA funding, it may be possible to distribute Popline CD-ROM free of charge to selected

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developing countries which have the capability to use and to share it. Such potential users are requested to indicate their interest.

For further information, please contact:

Population Information Program
Center for Communication Programs
The Johns Hopkins University
527 St. Paul Place
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Conference of the Peopling of the Americas, Veracruz. March/April 1992.

The International Union of the Scientific Study of Population (IUSSP) is a non-profit, international scientific organization composed of demographers and specialists in population problems. Presently, it numbers more than 1,800 individual members from 120 different countries. Its aims are to promote demography as a science and to bring the attention of Governments, international organizations and world public opinion to the importance of population problems. It realizes these goals through the organization of worldwide and regional conferences, through the work of its scientific committees and working groups and through its publications. It works in close cooperation with the United Nations, particularly the Economic and Social Council, the United Nations Population Fund (UNFPA), the United Nations Educational, Scientific and Cultural Organization (UNESCO) and its other specialized agencies, as well as with many other international organizations, central statistical offices, national demographic research centres and universities.

In commemoration of the 500th anniversary of Christopher Columbus' landing in the Americas, and at the kind invitation of SOMEDE, the International

Announcements

Union of the Scientific Study of Population (IUSSP) together with the Associacao Brasileira de Estudos Populacionais (ABEP), the Federation of Canadian Demographers (FCD), the Population Association of America (PAA), the Latin American Program of Research on Population (PROLAP) and the Sociedad Mexicana de Demografia (SOMEDE) held a Conference on the Peopling of the Americas, in Veracruz (Mexico), in March/April 1992.

This Conference was officially organized under the auspices of the Government of Mexico, represented by the Consejo Nacional de Poblacion (CONAPO), chaired by the Secretario de la Gobernacion, and with the full support of El Colegio de Mexico (COLMEX), of the Universidad Autonoma de Mexico (UNAM) and of other Mexican institutions.

The Conference presented research on the processes of population settlement and growth in the Americas from pre-columbian times to the present, giving equal weight to historical and contemporary research. The Conference has been interdisciplinary as well as international, encouraging active participation by scholars from around the world and from diverse disciplines, including anthropologists, geographers and biologists, as well as sociologists, economists, statisticians and, of course, demographers. Planned sessions covered mainstream demographic topics such as the demographic transition, fertility and mortality decline, family structure, rural-urban migration, and urbanization, as well as topics particular to the peopling of the Americas, such as slavery, the consequences of conquest and contact, pre-columbian population estimation, the political economy of international migration, the survival of the Amerindians, and population and environmental issues in the Amazon.

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SCIENTIFIC PROGRAMME

1. Plenary sessions

- P.1 Biological consequences of contact
- P.2 The debate on colonization and on migration
- P.3 Population and international relations
- P.4 Settlement patterns and environment in the Amazon basin
- P.5 Population perspectives: the Americas in the 21st century and beyond

2. Historical sessions

- H.1 Pre-columbian population and settlement process
- H.2 Estimating pre-columbian population
- H.3 Food production and regulation in pre-columbian populations
- H.4 Labour regimes in colonial America
- H.5 Volume, direction and composition of the slave trade
- H.6 The demography of slavery and the consequences of abolition
- H.7 Political economy of immigration: colonial period
- H.8 Political economy of immigration: modern period: 1800 until World War II
- H.9 Patterns of frontier settlement
- H.10 Survival of Amerindians
- H.11 Population dynamics and economic development up to 1930
- H.12 Initial stages of fertility decline
- H.13 The mortality transition
- H.14 History of family structure and gender relation
- H.15 Racial and ethnic intermarriage
- H.16 European cultural roots of American demographic systems
- H.17 Estimating fertility and mortality before the advent of modern vital statistics

3. Contemporary sessions

- C.1 Contemporary South-North migration
- C.2 Megacities in the Americas
- C.3 Internal migration and the changing balance of rural and urban populations
- C.4 International migration within Latin America and the Caribbean
- C.5 Asian migration to the Americas
- C.6 Racial and ethnic bases of economic inequality
- C.7 Demography of minorities
- C.8 Demographic aspects of language and ethnicity
- C.9 Institutional basis of fertility change
- C.10 Below-replacement fertility
- C.11 Trends in marriage, co-habitation and sexual behaviour
- C.12 Recent changes in family and household structures
- C.13 Demographic responses to the economic crisis
- C.14 The sexual division of labour and demographic change

Invited papers were published before the Conference in the Conference Proceedings. Contributed papers were also strongly encouraged.

Copies of Information Bulletin No. 1, containing the complete scientific programme are available upon request from:

Bruno Remiche, Executive Secretary
IUSSP, 34, rue des Augustins
B-4000 Liege, Belgium

Lebanese Studies Centre

The Lebanese Studies Centre is an independent research academy set up in 1980 in collaboration with the Middle East Centre of St. Anthony College,

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Oxford. The Centre aims at strengthening international understanding of issues facing Lebanon.

The Centre prepares and publishes research addressing historical, economic, political, psychological and cultural issues relating to and affecting Lebanon. It also organizes conferences and seminars for exchanging ideas and views on Lebanon.

The Board of Directors, which is the constituent body of the Centre, consists of a group of Lebanese who believe that a unified Lebanon would enable all sects to coexist in a background of respect of human rights and freedom of belief and thought and where social justice can be achieved through democratic government institutions.

The Centre is a registered charitable foundation relying on the support of individuals who provide it with aid. At the same time it reserves its independence under the supervision of an academic research committee.

NOTES ON THE AUTHORS

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Introduction

The purpose of this study is to investigate the effects of the proposed system on the performance of the system. The system is designed to improve the performance of the system by reducing the time taken to process the data.

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