

The Proximate Fertility Determinants among Sudanese
Women in an urban community,
Case study of El Dueim town

Asia Mohamed Sharif

Ass.Pro. Sociology, Anthropology & Social Work Dep.

asiashareef27@gmail.com

00249 12898115

مستخلص

تعتبر الخصوبة إحدى العوامل المسؤولة عن نمط التغير السكاني في السودان، والدراسة الحالية محاولة لتقصي بعض هذه العوامل التي تؤثر على الخصوبة في المناطق الحضرية في السودان، أخذين مدينة الدويم كدراسة حالة. استخدمت الدراسة نموذج "بنغارت" لمحددات الخصوبة الوسيطة كإطار تحليلي. اختارت الدراسة نمط الزواج، وسائل تنظيم الحمل، وفترة تم اختيار عينة من نساء سبق لهن توقف الحمل، لتحليلها كمحددات وسيطة تؤثر على الخصوبة بصورة مباشرة. الزواج (١٥-٤٩ سنة)، وذلك من ٢٨ حي في مدينة الدويم. جاء اختيار العينة عشوائياً بالطريقة الطبقيّة باعتماد تقديرات تعداد ١٩٩٣ لمدينة الدويم كإطار للعينة. وجمعت البيانات عن طريق استمارة صممتها الباحثة لهذا الغرض. أهم النتائج التي توصلت إليها الدراسة هي: إن التعليم، العمل، ونمط السكن ذات أثر معتبر على محددات الخصوبة الوسيطة، وجدت الدراسة أن معرفة واستخدام وسائل تنظيم الحمل أكثر انتشاراً وسط النساء المتعلّقات والملتحقات بعمل مدفوع الأجر، واللائي يسكن في أحياء وسط المدينة والمسكن الحكومية، فترة توقف الحمل بين الولادات تطول وسط غير المتعلّقات، وغير الممتهّنات لعمل مدفوع الأجر، ومن يسكن في أحياء الدرجة الرابعة. وتعتبر اطالة فترة توقف الحمل هي الوسيلة الرئيسية لتأخير الحمل وسط هذه المجموعة. أما في المجموعة الأولى، فيتعبّر الاستخدام الفعال لوسائل تنظيم الحمل هي الوسيلة الرئيسية لتأخير الحمل وهي تعتبر تعويض للفترة القصيرة لتوقف الحمل لدى هذه المجموعة.

ABSTRACT

Fertility is one of the factors responsible for the pattern of population change that is believed to be taking place in Sudan, this study is an attempt to investigate some factors affecting fertility in a Sudanese urban setting, taking El Dueim town as a case study.

Bongaarts, s model for the " proximate determinants of fertility" is used as the analytical framework . Marriage pattern, contraception and post-partum infecundity are analyzed as the main proximate determinants that affect fertility directly. A sample of ever –married women aged 15-49 years was selected from the 28 neighborhoods in El Duim town. The sample was selected randomly using stratified cluster sampling procedure. The 1993's census' projection of El Dueim town formed the sampling frame. The data was collected by face to face interview

using a designed questionnaire. Education, occupation and type of residence have a considerable effect on the proximate determinants of fertility. Ever-use, knowledge and current use of contraceptives are found to be more common among the women who are educated, engaged in gainful jobs and reside in the town centre & government houses; post-partum infecundity periods are longer among the uneducated, unemployed and those who reside in fourth class neighborhood. The long period of infecundity is considered as the main mean to delay birth among this group. The effective use of contraceptive is the main mean to delay birth, which compensate the short period of post-partum infecundity among the former group.

Introduction:

Sudan is considered to be one of the countries with high fertility and population growth rates (Sudan, 1982). However, in recent years it has been observed that fertility levels have been declining, especially in the urban areas of northern Sudan (Sudan, 1982). Reasons for such decline are not fully understood. However, in the Sudan, in spite of many demographic studies, there are few studies on socio-economic factors affecting fertility (Abbas, 1983).

However, this study is aiming at verifying factors effecting fertility. The study of the effects of different factors on fertility behavior is essential to determine the undergoing fertility patterns and trends in the human population. In general, fertility is directly affected by biological and behavioral factors that tend to determine exposure to sexual intercourse and child bearing (Bongaarts, 1978). The cultural, economic and social situations affect fertility indirectly through the intermediate variables that are stated by Davis and Blake (Bongaarts, 1978). According to Davis and Blake, the intermediate variables which are series of biological and behavioral factors, include factors affecting exposure to intercourse, conception and those affecting successful gestation.

Bongaarts restricts the eleven intermediate variables introduced by Davis and Blake in 1956 to only four: marriage which is one aspect of exposure to intercourse, contraception which affects exposure to the risk of conception, abortion which is one aspect of gestation outcome and postpartum infecundability (Bongaarts, 1978). But in spite of the importance of abortion effect, it is usually excluded in explaining fertility in most developing societies because of the lack of data about total number of abortions.

This study hypothesizes that there is a direct relationship between the socio-economic and demographic status of women and the proximate determinants of fertility. More narrowly, there are direct effects of female education, female participation in labor force and the type of residence; on the age at first marriage, use of contraception and post-partum infecundity which in turn influence directly the number of children ever-born.

Key words: Children ever born, fertility determinants, proximate determinants.

The Study Problem:

In this study three main proximate determinants of fertility: marriage pattern, contraception and the post-partum infecundity, have been selected out of those ones developed by Bongaarts, and their relative contribution to the level of fertility of selected sample in El-Duiem town in White Nile state is examined. However, these proximate determinants are assumed to be largely affected by socio-economic and cultural variables. The change that might

occur in these variables will perhaps automatically push up the effect of the proximate determinants on fertility. Throughout this study some socio-economic variables which are assumed to affect the proximate determinants directly and fertility level indirectly are selected to be analyzed. Fertility preferences are analyzed as indicator of cultural attitudes that affect fertility behavior,

METHODOLOGY

Study area

El-Dueim, the area of the study, is located on the West Bank of the White Nile about 150 kilometers south of Khartoum and it is linked to the national capital by a paved high way. It extends for 5 kilometers from east to west and 3 Kilometers from south to north. The total area is about 12 square Kilometers.

According to the 1993 census the total population of El-Dueim was 76.336. Due to drought and desertification some nomadic tribes, mainly from Western Sudan, came to live in the town. The main tribes of the area include the Ga'affra, Hassaniya, Shaiqiya and Kurtan. There are 28 neighborhoods in El Dueim town. Most of the houses are built of mud, unbaked mud brick, and a few are built of red bricks. Some of these neighborhoods lack electricity and water services.

The sample design:

A total of 510 ever-married women were determined to be the sample for the study. The sample design used here is the stratified cluster sampling. The town was stratified for the purposes of study into three residential zones, the town centre & government houses, the third class residential area and the fourth class area. This classification is based on some socioeconomic characteristics of each zone.

The sample was drawn from 17 neighborhoods out of the 28 neighborhoods that constitute El Duiem town. These 17 neighborhoods are regarded as the primary sampling unit (PSU) of the study. The 1993 census primary enumeration for El Duiem town formed the sampling frame. The target sample size was 510 ever-married women selected from 485 households. .

The data collection:

The data were collected by face to face interview using a designed questionnaire. The Sudan Fertility Survey (SFS, 1979) and the Demographic and Health Survey (SDHS, 1990) were used as a model for designing the questionnaire. It was written in formal Arabic, however the interviewers were instructed and trained to explain the questions that seemed to be difficult for the respondents, especially the uneducated ones. So they used simple sentences during the data collection. The ethical considerations are intended to be included during data collection; mainly the secret of the information,

In order to test the questionnaire, a pilot survey was conducted, using sample of 30 ever-married women. The researcher, accompanied by three female interviewers, carried out the pilot survey's fieldwork. Many notes and observations were recorded during the interviews. As a result of this pre-test, many modifications and adjustments were made to prepare the final form of the questionnaire. The questionnaire was classified into sections in order to obtain the data needed for the variables selected in this study. Data entry was done in a microcomputer, checks were made to clear data and detect errors of coding and data entry. Calculation of frequencies

with percentage means for each field was obtained. The program of space Integrated-Micro-Computer Processing System (IMPS) for census has been used in data analysis.

Results :

Crude Birth Rate (CBR) is the number of births in a year per 1000 midyear population “Who exposed to the risk of child bearing during the year”. CBR is affected by many factors mainly; age-sex composition of the population. The CBR is found to be 53.2 per 1000 population in El- Dueim Town. This level is high compared to CBR for Sudan in 1993 census, which was 32.0 per 1000 population. General Fertility Rate (GFR) is simply, the number of births per 1000 women of childbearing age. The reported GFR among the studied women in El Dueim town was found to be 196.9 per 1000 women aged 15-49 years.

ASFR is defined as the ratio of births to the number of women in the corresponding groups, in a specified time period, usually a year. ASFR is obtained by dividing the births in the 12 months preceding the date of the survey (which was distributed by the age of mothers at reproductive period) by the number of women on the same age group. The dominators were based on the age distribution of all ever married women (irrespective of current marital status) enumerated in the survey. TFR is the sum of all the Age-Specific Fertility Rate multiplied by five. Age-Specific Fertility Rate are expressed per 1,000 women, while the TFR is expressed per one individual women. ASFR reflect the actual fertility of women in the age groups for which they are calculated, but TFR represent the number of children a woman would have during her reproductive life time, if she followed the current age- specific fertility rate of that age group (Bongaarts, 1978).

By examining ASFR in Table (1) we found how fertility differs among women in different age groups. ASFR appears to be lower than that obtained in national surveys, e.g. SFS (1979) that of this population occurs at 30-34 years. In fact 51% of the births occur to women aged 25-34 years, suggesting that the fertility behavior among women in Dueim is similar to that found elsewhere in Sudan. The TFR was found to be 6.5, which is slightly lower than that found in the SFS (6.9). But it is higher than that given by the Sudan Demographic and Health Survey (5.0).

Gross Reproduction Rate (GRR) is used as an indicator of reproductivity of the population studied. It shows how population is replacing its own numbers by natural process. GRR measures the numbers of daughters that a woman will have. In the absence of data of female births, the GRR can be obtained by multiplying the TFR by the sex ratio, which is assumed to be 0.48428. It assumes that all of the females survive to the end of the childbearing period. It is found to be 3.1 girls’ births per a woman in El Dueim town.

Table.1: Age-Specific Fertility Rates (per 1,000 women) and Total Fertility Rate (for women 15-49)

Age	Number of Women	Number of births in past year	ASFR
<20	195	10	0.051
20-24	179	40	0.224
25-29	173	41	0.237
30-34	122	52	0.426

35-39	133	30	0.226
40-44	71	71	0.127
45-49	56	1	0.017
Total	929	183	1.308
GRR/TFR		197	6.54

Discussion:

Children Ever-Born:

Table (2) shows the percent distribution of women according to number of children ever born (CEB). The age group 45-49 years represents women who have passed their reproductive age. The number of children born to these women was found to be 7 live births on average. This is more than that found in Sudan Fertility Survey (6 children) but however, lower than that reported in Sudan Demographic and Health Survey (8 children). It is clear that 50% of women aged 45-49 had 7 or more live births while 19 percent had 4 or less live births. On the other hand, the table shows that 6% of the women in the study are childless. This could be considered as high average because there is a high percentage of currently married women who are continuously exposed to childbearing. This percentage is lower than that given in the SFS, which was 9 percent, but higher than that found in the SDHS, which was only 2 percent. The increase in sterility could be attributed to the poor health conditions among the population under study.

Table.2: Mean number of children ever born to ever-married women by current age.

Current age	Number of children ever-born						Total	Total mean
		1-2	3-4	5-6	-8	+		
<20	.1	85.7	7.1	-			100	1.4
20-24	.1	68.9	20.3	2.7			100	1.8
24-29	.6	45.0	30.5	16.5	.1		100	2.8
30-34	.2	29.4	29.4	22.0	.2	.8	100	3.4
35-39	.4	17.0	19.6	19.6	8.8	9.6	100	5.7
40-44	.4	13.2	16.2	20.6	3.5	2.1	100	6.1
45-49		9.5	9.5	31.0	4.3	5.7	100	7.1
All	.9	32.7	22.0	17.8	0.8	0.8	100	4.3

Table 2 also shows that the mean number of children ever born is increasing in parallel with age. Women who are less than 20 years old had on average one live birth compared to the 7 children for women aged 45-49. However, 77 percent of women aged 20-24 had on average one or two children which decreased to 8 percent for women aged 40 years old.

The comparison between the level of fertility at all ages in Table (2) with that reported in SDHS for the same age groups, revealed that there was a slight decline in fertility since 1990. This appears when we compared the fertility of women aged 30-34, 35-39 and 40-49 which was 3.4, 5.7 and 6.1 respectively, to that reported in SDHS which was 4.8, 6.5 and 7.6 children respectively for the same groups.

Children ever born by age at marriage

Age at first marriage considered as an important factor, among other factors, that affect fertility directly especially in the absence of effective use of contraception. In addition, the start of child bearing depends on exposure to sexual intercourse, which takes place only within marriage union in communities under study. The effect of age at marriage on fertility was examined by relating age at first marriage, current age and the mean number of children ever-born to ever-married women. As it has been shown 3, the mean number of children ever born relate inversely to age at first marriage. The earlier the age at marriage the higher will be the achieved completed fertility. It is largest among women who are married before 15 years, decreasing gradually to reach a minimum when a woman married after the age of 30 years and over.

Table .3: Mean number of children ever born to ever married women by current age and age at first marriage

Current age	Age at first Marriage age					
	15	15-18	19-22	23-25	26-29	30+
<20	.5	0.8	-	-	-	-
20-24	.6	1.6	1.0	0.5	-	-
25-29	.9	2.8	1.9	0.6	1.0	-
30-34	.3	4.1	3.3	2.3	1.3	2.6
35-39	.4	7.1	4.1	3.4	2.4	1.1
40-44	.6	5.8	5.2	3.6	2.7	0.8
45-49	.5	6.6	6.0	4.3	1.0	1.5
All	.4	4.0	3.0	2.6	1.6	1.5

However, from this table we can conclude that when age at first marriage is controlled, the number of children ever born becomes a function of the current age. The mean number of children ever born increases by age to reach 8 children at 45-49 years of age. It means that

women who marry at younger age are more subjected to a longer reproductive exposure time, if the marriage is not disrupted (Saghayroun, 1985). The mean number of births for any cohort decline when the marriage is late. The above mentioned findings show out the negative relationship between fertility and age at first marriage in El Duiem town.

Children ever-born by duration of marriage

Marital duration i.e. the number of years spent in marriage union, affect strongly fertility level. Keeping variables of age at first marriage, use of contraception and fecundity constant, it has been found that there is a positive relationship between fertility level and years spent in marriage union. Duration of marriage is determined by age at first marriage and stability of the marriage union. Divorce, widowhood and separation are typical disturbance factors affecting reproductive exposure time (Bongaarts, 1993).

The length of time spent in stable marital unions affect fertility greatly in Sudan where fertility pattern approximates the natural pattern (Saghayroun, 1985). Definitely, any loss time in exposure period, will result in lower fertility, other things remaining the same (Bongaarts, et al., 1984). However, SFS (1979) indicated that there is a moderate level of marital instability in the Sudan. It is observed that 17.5 percent of marriages are dissolved either by divorce/separation (11.7%) or by widowhood (15.8%). However, in 1990 (SDHS) this percentage decreased to 8% of ever-married women, 3% by death and 5 percent by divorce. In this study, marital instability is low in the studied area (10 percent), 4.1 percent had been solved by death and 5.6 percent by divorce or separation.

By examining the relationship between the stability of marriage and the number of children ever born we will find the effect of marital stability on fertility (Bongaarts, 1993). The data from the survey suggest that women who are in stable union had higher number of children than those whose unions had been dissolved in all marital duration. Among overall ever-married women, those whose marriage union is stable had 5 children on average compared to those with a dissolved marriage (4.5 children).

Children ever-born by times of marriage

Remarriage is another factor which affect the nuptiality-fertility relation. Unfortunately, this relation could not be investigated by our data. This is because the proportion of re-marriage in the sample is very low and insignificant statistically. Generally, the intensity and rate of re-marriage in the given society are culturally and socially determined. But re-marriage is affected by the age at which the previous marriage is broken and the acceptance and encouragement of the society for the person to marry another wife or husband (United Nations , 1995)

Fertility of more than one marriage is affected by periods spent between marriages, the fertility of the woman in the first marriage and the desirability of children in subsequent ones. The reason for which the first marriage was broken also affects remarriage. It is observed in some studies that re-marriage might enhance fertility if childlessness was behind the dissolution of the first marriage (Caldwell & Caldwell, 1993).

Socio-economic Status and Fertility

Women's background characteristics i.e. their status, play an important role in determining their reproductive behavior. It is widely hypothesized that uneducated women who are mainly concerned with domestic affairs, raising children and living in a rural area, had a higher fertility level than educated women who are engaged in a paid employment and living in a city (Bongaarts, et al., 1984). This section attempts to provide support to this suggestion.

The Sudan Demographic and Health Survey (1990) provided that the largest fertility differentials are associated with educational background, the TFR in the five years preceding the SDHS was 5.9 for woman with no education and 3.3 for those with Junior Secondary education and higher. Generally, all national censuses and surveys in the Sudan had found the negative relation between education and fertility (Henin, 1968).

Table (4) shows this negative relation between education and fertility. Overall, as appears in the last column, there is an apparent difference of mean number of children by education. The mean number of children ever-born declines as the educational level increases. Women who are not educated had mean number of 5 children which declines to 3 children for those with primary school and over. The difference between women with no education and those with primary level appears to be not significant.

It is also clear that the level of education appears to have a negative effect on fertility according to age at first marriage. Mean parity declines as age at first marriage and educational level increase. Women who had married at age less than 15 years and had not attended school, had a higher level of parity (5.4) than those with high education level, even when they married at the same age. This difference is significant for women with education level above senior secondary, and not so significant for those below senior secondary level, who marry at the same age with those who have not gone to school.

Table 4: Mean number of children ever born to ever married women by age at first marriage according to Education.

Educ ation	5>	5-17	8-20	1-23	4-26	7-29	0+	LL
Not educated	.4	.2	.1	.6	.6	.3	.4	.4
Prim ary	.0	.6	.0	.5	.2	.5	.0	.4
J. Second.	.1	.3	.1	.6	.3	.0	.3	.0
S. Second.	.0	.5	.0	.7	.6	.9	.0	.6
Univ ersity	.0	.0	.0	.0	.3	.7	.0	.0

The same trends could be seen in the other groups as the table shows. For example among these who had been married at age 30 years and over, the uneducated had a higher level of parity than those with secondary and higher level of education in the same group. Therefore it can be concluded that the low level of education could result in a high level of fertility even if a woman married at late age 30 years and over. Surprisingly, women who had primary level of education had higher fertility than those with no education among most groups of age at first marriage. For example, women who had been married at age less than 15 years and at age 15-17 years and had primary level of education had mean parity of 6 and 5.5 live births, respectively. Those who are uneducated in the same groups had 5.4 and 4.2 live births. However, it is necessary to treat this finding with caution because of the small number of women with educational level above senior secondary education in the sample. As this study hypothesized, the determining of the sole effect of women employment on fertility is difficult and complicated.

This is because employment is bound up with other variables which affect fertility e.g. education. Nevertheless, there is still confusion of fertility-employment relation condition (Saghayroun, 1985). Does a woman work because she has a few number of children or she has a few number of children because she work? Or does the high status, which is connected with higher work, activity result in low fertility?

The assumption here is that women’s participation in a gainful employment has an uncertain net effect on fertility level. Table (5) proves this assumption, because little difference in the mean parity is found among different work groups in all groups of age at first marriage. The exception of this is the difference seen between those who work in clerical jobs and those who are engaged in other types of occupations. This could be explained, if possible, as that the clerical jobs mostly demand a higher (university) level of education than other types. Other than this small difference, no significant difference is seen between the formal occupations (including clerical, government worker and teacher) and the informal (including street vendor and others) and those who are not working.

Table 5: Mean number of children ever born to ever married women by age at first marriage according to Occupation

Occupation	5>	5-17	8-20	1-23	4-26	7-29	0+	LL
Not work	.7	.4	.5	.6	.0	.5	.4	.8
Clerical	.0	.7	.0	.4	.6	.8	.1	.6
Govern Worker	.3	.0		.0	.0	.0	.0	.1
Teacher	.0	.0		.5	.0	.0	.0	.5
Street vender	.3	.0	.7		.5		.0	.8
Others	.4		.0	.0			.0	.6

However, the pattern of negative relation between age at first marriage and mean parity is seen among all groups of occupation types.

Most of studies and demographic surveys have suggested that rural fertility is higher than the urban one (Saghyurown, 1984). The hypotheses here has been that the mere living in a city is not enough to determine fertility level. The socio-economic background characteristics of the population in a certain residence are the most important.

Unexceptionally, it was found that women living in the Slum areas, most of whom are rural migrants, have lower fertility than those living in and near the town centre which is more developed and urbanized as appears in the last column in Table (5). This pattern appears among women in different age at first marriage groups as the table shows.

Table.5: Mean number of children ever born to ever married women by age at first marriage according to type of Residence

Residence	15	5-17	8-20	1-23	4-26	7-29	0+	ll
To wn centre & Gov. house	.0	.6	.6	.8	.5	.4	.5	.7
Thi rd class	.5	.6	.2	.1	.6	.5	.8	.7
Fou rth class		.2	.0	.2	.3	.0	.0	.6

This could be conceptualized as that women in slums suffer sub-sterility for health reasons more than those living in other types of residence which are occupied by well- to-do families who could have access to a better health services. Also husbands in slums used to migrate (in and out the country) for a long time. This absence of the husband may prolongs the sexual abstinence and hence reduces fertility (Abbas & Sabiti, 1985).

Conclusions:

This study presented fertility level according to current age, age at first marriage and socio-economic background. The main findings could be summarized in the following points:

1. The mean number of children ever born (CEB) is found to be low and tends to confirm the previous findings that fertility level is probably declining in Sudan. The fertility measurements selected in order to estimate fertility level included the TFR, CBR, GRR and GFR. These measures confirm the finding that fertility is much lower than previously observed in early censuses and surveys.

2. Fertility level is found to be negatively related to women’s education. Women who are not educated had more children than those who were educated. In addition, women employment affect fertility level through other related variables especially education.

3. The slums have witnessed low fertility than that of the other types of residences. It appears that the poor health status in these areas affects the reproductive behavior of women residing in these areas. However, it is not clear what are the health factors affecting fertility of these women.

It can be concluded that, although fertility level is high, there is a slight trend of declining. This is due to the improvement of women status mainly through education. Also the low fertility among women could have been affected by husband’s absence, many people from the studied area are working as migrants in the oil rich countries. This could have a negative effect on fertility level of women in this area.

References

- 1- Abbas, I. & Sabiti, k., 1985. *The Proximate Determinants of Fertility in Northern Sudan*, Netherlands: Voorburg.
- 2- Abbas, Y., 1983. *The Relationship between Nuptiality and fertility in the Sudan*, Khartoum: National Council for Research.
- 3- Bongaarts, J., 1978. A Framework for Analyzing the Proximate Determinants of Fertility. *Population and Development Review*, 4(1), pp. 105-132.
- 4- Bongaarts, J., 1993. "The Supply-Demand Frame Work for the Determinants of fertility : An Alternative Implementation. *Population Studies*, 47(3), pp. 437-456.
- 5- Bongaarts, J., Frank, O. & Lesthaeghe, R., 1984. The proximate determinants of fertility in sub-Saharan Africa. *Population and Development Review*, 10(3), pp. 511-537.
- 6- Caldwell, J. & Caldwell, J. P., 1993. The South African Fertility Decline. *Population and Development Review*, 19(2), pp. 225-262.
- 7- Henin, R., 1968. *Fertility Differeentials in the Sudan with Reference to Settled and Nomadic Population*. Unpublished Ph.D.Thesis: Univercity of London.
- 8- Saghayroun, A. A. R., 1985. Women's status and fertility in the Sudan. *Ahfad journal*, 2(1), pp. 53-62.
- 9- Saghyurown, A., 1984. *Determinant of Family Size in Rural Sudan*, Khartoum: National Council for Research.
- 10- Sudan, Department of Statistics, 1982. *The Sudan Fertility Survey 1979* , khartoum: Ministry of National Planning.
- 11- United Nations , 1995. *Concise Report on the World Population situation in 1995*, New York. : Population Division.