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Fertility And Fertility Determinants: A Nexus For Understanding The Need To Manage The Fertility Of Women In Awka Town, Anambra State, Nigeria

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-----ABSTRACT------

Research has shown that childbearing preferences greatly contribute to high fertility rate and by extension the low incidence of the development of female entrepreneurs. Consequently, this study examined the contribution of 17 selected fertility determinants to the fertility of ever-married women in Awka town. The selected fertility determinants are: age at first marriage, menopause, average length of breast feeding, coital frequency, still birth, average length of birth spacing, educational level, religious denomination, value of a son, value of a daughter, child labour, income, job classification, number of siblings, age at menarche, marriage type and age at first birth. A survey research method was adopted for the study, while systematic sampling technique was employed to generate data using questionnaire. The generated data were analysed using Principle Component Analysis (PCA) and multiple regression. The PCA collapsed the 17 determinants into 5 components, while multiple regression was used to determine the contributions of each of the 5 components to the fertility of the ever-married women. The result showed that component one (comprising age at first marriage, age at menarche and age at first birth) made the highest contribution to the variations. The study therefore recommends increase in girl child education up to secondary school and higher institution levels, and increased and better employment opportunities for women so as to militate against early marriage, early child bearing age and consequently high fertility rate.

KEYWORDS: Children-ever born, Ever-married women, Female entrepreneurs, Fertility determinants, High fertility rate.

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I. INTRODUCTION

Since the publication of the popular Malthusian essay on population, demographers, development practitioners, and many international bodies like the World Bank, United Nations Development Programme (UNDP) and the World Population Bureau have made remarkable contributions towards population control, particularly in the developing countries. In particular, according to Akpotu (2008), the 1994 International Conference on Population and Development (ICPD) held in Cairo further stimulated Governments to begin to formulate population policies to address fertility and population growth problems. In furtherance of this pursuit, two decades ago, Nigeria adopted a population policy, which had family planning as a key instrument in the regulation of high fertility, two out of the ten targets of the policy are: (1) to reduce pregnancy of mothers below 18 years and above 35 years of age by 50 per cent by 1995, and by 90 per cent by the year 2000; (2) to reduce the proportion of women bearing more than four children by 50 per cent by 1995 and by 80 per cent by the year 2000 (NPC, 1988).

Nevertheless, the National Total Fertility Rate (TFR) of 5.3 in 2001 indicates that most women still bear more than the prescribed four children (NPC, 2006 a & b). Also, a large segment of the population does not have access to family planning services. Besides, teenage marriages, high maternal mortality, inequitable distribution of population have still not changed to the desired direction. Specifically and essentially too, one area that has witnessed a steady increase in fertility level is Awka town. This is revealed by a rising fertility level for a five yearly periods as 4.5 (1991), 4.8 (1996), 5.3 (2001) and 5.7 (2006) (NPC, Awka, 2006). Fertility according to Bhende and Tara (2003), and Bongaarts (2008) is the number of Children Ever Born (CEB) to women or the actual reproductive performance. The CEB is directly affected/decided by certain factors known

as fertility determinants. Since women are directly involved in actual reproductive performance; they are the most affected by the determinants of fertility and are the central subject in the study of fertility.

The choice of Awka town as a reference for this study is because of its status of a state capital, an urban area and its reminiscence of a rural setting. More so, since all the determinants of fertility interplay in every society, therefore, Awka town is no exception. Awka people are predominantly specialists in iron, copper, brass and bronze works; carving of wooden implements and ornaments; agriculture and trade. Hence, wives and by extension sons are looked upon as assets for the enhancement of these activities. Consequent upon these are increased polygamous activities, fertility preferences, high fertility rate and large family size.

The study of fertility is central in the understanding of population replacement and growth as inadequate replacement might make a society become extinct, while excessive growth can create social and economic problems. This raises the question of what is the contribution of the fertility determinants to the increasing fertility of the ever-married women in Awka town

II. LITERATURE REVIEW

Fertility determinants can be biological, economic and socio-cultural (Weeks, 1999; Bhende and Tara, 2003). Similarly, Bongaarts (1978, 87 and 2008) and Potter (1965) identified some measurable direct determinants of fertility, which include: Age at first marriage, menopause, average length of breast feeding, coital frequency (frequency of intercourse) and spontaneous intrauterine mortality (still birth/miscarriage/pregnancy loss), average length of birth spacing (through the use and effectiveness of contraception or family planning), and abortion.

In another study on the value of children, child labour and fertility preferences in urban Nigeria, Togunde and Newman (2005) employed the value of a son, value of a daughter, child labour, parental income, parental education, and parental occupation as fertility determinants. Also, Okere (1987) identified the woman's level of education, religious affiliation, the woman's income, job classification, number of siblings and age at menarche as the fertility determinants among the Igbo in Eastern Nigeria, while Halilu (1981) among other fertility determinants employed age at first marriage and marriage type in the study on fertility and nuptiality levels, patterns and differentials in Nigeria.

The patriarchal background of most communities in Nigeria has a bearing on the observed fertility among women. This observed fertility according to Togunde and Newman (2005) is a function of the interplay of fertility determinants. Ihejiamaizu (2001) posited that the fertility of women differ mostly by their educational status, value of children, age at menarche, age at first marriage, nature of job and religious affiliation. Ihejiamaizu (2001) also noted that the probability of having first birth during adolescence is more among women without formal education and is consistently at least twice that of their more educated counterparts including those with primary education. This explains why the Population Reference Bureau (2001) regarded women education as a long-term strategy for fostering economic growth and the promotion of smaller families. Similarly, Psacharopoulos and Woodhall (1997) stated that women from all households and with lower income and education enter into marriage early and have higher fertility, hence a continued cycle of illiteracy and poverty.

The tempo of the celebration at the birth of a child after marriage is to a large extent influenced by the value the parents attach to a son and a daughter. Aside the issues of inheritance, female children are erroneously viewed as owing responsibility and support to their marital home when married and not to their parents. But they are still being valued, as they are believed to assist their parents financially in business; are hoped to become wives/mothers later in life as well as to take care of their parents financially at old age. Sons are, on the other hand, viewed as the ones to assists their families' financially in old age as well as perpetuate family name. The drive for male children and hence high fertility is also related to religious practice. In some locations, certain rituals or custody deities are exclusively for males, priests of these deities will therefore go to any extent to have sons. Therefore, with respect to this high premium on male children as compared to females, women that have only female children or who are experiencing male infant mortality are compelled to keep bearing children until the desired sons are born (Harrison, 1985;Umoh, 2001). These children grow up to work in the informal labour market economy in a bid to contribute to the household's economic survival. Thus, money is transferred from such children to their parents. According to Togunde and Newman (2005), this confers on some women in South Western Nigeria the advantage of giving birth to additional children, since the rearing costs are not borne by them alone.

This study was therefore designed to examine the contribution of selected fertility determinants on the fertility of ever married women in Awka town. Ever married women are women who are married and staying with their husbands or married but separated or widowed or divorced. The selected fertility determinants were gleaned from prior studies on fertility determinants. Thus, the determinants: value of a son, value of a daughter and child labour were selected from the study by Togunde and Newman (2005) in urban Nigeria. The determinants: value of a son and value of a daughter were chosen because Awka people are known to attach strong value to the sex of a child, especially the male sex, while child labour was chosen because of its commonplaceness in the area largely due to the enterprising nature of the people. Also, from the study of Okere (1987) in South-Eastern Nigeria, the determinants: level of education, religious affiliation, income, job classification, number of siblings and age at menarche were adopted since South-Eastern Nigerian towns of which Awka is one shares similar characteristics. Marriage type and age at first birth were adopted from the study of Halilu (1981) because of the strong effect they are known to have on fertility. Six out of the Bongaarts (1978, 87 and 2008) identified proximate determinants of exceptionally high fertility were adopted because they had been used in fertility studies in developing countries.

III. METHODOLOGY

The sample size for the study is made up of 1,661 ever-married women. Systematic sampling technique was employed to select these women from the population of 8,309 households in Awka town, Anambra state. This entailed the administration of the questionnaire on any ever-married woman after every five residential houses on all the main streets and streets transversing the main streets in each of the four districts in Awka town. Of the 1,661 questionnaire that were sent out, 55 were discarded because of missing data, leaving 1,557 questionnaire usable for a response rate of 94 %. The research instrument was validated by experts in population studies, while the reliability of the instrument was established using the Cronbach's alpha which yielded 0.880. The data collected on the basis of the 17 selected fertility determinants were collapsed using the Principal Component Analysis (PCA) before applying multiple regression analysis to determine the contribution of the collapsed fertility determinants to the fertility of the ever-married women.

IV. RESULTS AND FINDINGS

Table 1 depicts that majority (45.5%) of the respondents had their first marriage at an age between 20-24 years with 61% of them being in monogamous union. Concerning educational level and religious denomination, majority (41.7% and 39.3%) of them had no formal education and are of the protestant denomination respectively. Forty three percent of the respondents work in the commercial sector, while thirty one percent earn over №21,499. Table1 further reveals that 45.1% of respondents have over 3 siblings, while 33.7% of the respondents had 4 of their children involved in child labour. Age at menarche is reported by 42.5% of the respondents as 13 years, while majority (31.8%) reported a coital frequency of 5 times per week. More than half (64.9%) of the respondents reported no case of miscarriage, while majority (43.9%) had their first births at an age between 25-29 years. The average length of birth-spacing reported by majority (40.7%) of the respondents is for a period between 7-11 months. Majority (85.9%) of the respondents have not reached menopause. Table 1 also reveals that 54.8% of the respondents value sons on the ground of continuity of family name and contribution to family income, while 40.9% of the respondents valued daughters because they will help them establish son-in-law relationship.

Table 1: Classification of Respondents by the Selected Fertility Determinants

Fertility determinants		N = 1,557		
•		Frequency	%	
	≤ 19	185	11.9	
	20-24	710	45.6	
Age at First Marriage (in yrs.)	25-29	623	40.0	
	30-34	24	1.5	
	35+	15	1.0	
Type of Marriage	Monogamy	949	61.0	
	Polygamy	608	39.0	
	No. formal edu.	648	41.7	
	Primary	565	36.3	
Educational Level	Secondary	178	11.4	
	Post-Secondary	117	7.5	

	Post-Graduate	49	3.1
Religious Denomination	Traditional Islam Catholic Protestant Others	300 29 604 612 12	19.3 1.9 38.8 39.3 0.8
Job Classification (sector)	Agric. Commercial Health Banking Education Others	11 670 200 106 570	0.7 43.0 12.8 6.8 36.6
Avg. Monthly Earning (N)	≤6,499	86	5.5
	6,500-11,499	254	16.3
	11,500-16,499	353	22.7
	16,500-21,499	381	24.5
	21,500+	483	31.0
Child Labour	1	230	14.8
	2	250	16.1
	3	525	33.7
	4	521	33.5
	5+	30	1.9
Number of Siblings	0	6	0.4
	1	119	7.6
	2	148	9.5
	3	582	37.4
	4+	702	45.1
Age at Menarche (in yrs.)	11	133	8.5
	12	290	18.6
	13	661	42.5
	14	428	27.5
	15+	45	2.9
Coital frequency (weekly)	≤3	45	2.9
	4	243	15.6
	5	495	30.8
	6	456	29.3
	7	318	20.4
Miscarriage	1	375	24.1
	2	134	8.6
	3	34	2.2
	4+	3	0.2
	None	1,011	64.9
Age at First Birth (in yrs.)	≤ 19	165	10.6
	20-24	596	38.3
	25-29	544	43.9
	30-34	226	14.5
	35+	26	1.7
	1	634	40.7

Average Length of		$1\frac{1}{2}$	611	39.3
Birth Spacing (in	yrs.)	2	260	16.7
		21/2	52	3.3
Average Length o	f	<6	366	23.5
Breast-Feeding (i		7-11	728	46.8
breast-recaing (i	ii Wiontiis)	12-16	463	29.7
		40-44	25	1.6
		45-49	163	10.5
Age at Menopaus	e (in vrs)	50-54	18	1.2
rige at Menopaus	c (m y15.)	55+	12	0.8
		Have not	12	0.0
		reached menopause	1,339	85.9
		•		
	Contributes to fam	ilv income	242	15.5
		nts financially at old age	256	16.5
Value of a Son	Continues family r		567	36.4
		ove of spouse and family		13.2
	members		,	
	Confers on moth	ers the right to family	y 286	18.4
	inheritance			
	Assists the parent	ts financially in business		
Value of	and in domestic c		438	27.8
a Daughter	Contributes to far		231	14.8
u Duugiitti		nothers later in life	123	7.9
		arents financially at old	_	8.2
	age		-	
		son- in-law relationship	637	40.9
	•	1		

Table 2: Distribution of Respondents by Number of CEB

No. of Children	Males	%	Females	%	No. of CEB	%
0	15	1.5	10	1.8	25	1.6
1	24	2.4	17	3.1	41	2.6
2	111	11.1	63	11.4	174	11.2
3	167	16.6	134	24.2	301	19.3
4+	686	68.4	330	59.5	1,016	65.3
Mean	3.5		3.4		5.8	

Note: CEB = Children Ever Born.

Table 2 reveals that 65.3% of the respondents gave birth to more than three children, while 34.7% of the respondents had less than four children. Also, 68.4% and 59.5% of the respondents are males and females respectively. The mean CEB is 5.8. This implies that there are more male than female children.

The extraction of the significant coefficients for ordinary and rotated matrices was based on Kaiser-Meyer Olkin (KMO) principle. Based on this principle, coefficients above the 0.60 threshold were selected as significant for the analysis. The correlation matrix shows that there is a strong correlation between: X_6 and X_1 , that is, average length of birth spacing and age at first marriage; X_{14} and X_1 , that is, number of siblings and age at first marriage; X_{17} and X_{17} and X_{17} , that is, age at first birth and age at first marriage; X_6 and X_3 , that is, average length of breast feeding; X_{17} and X_{17} and average length of breast feeding; X_{17} and X_{18} and X_{19} and X_{19}

Based on the Kaiser-Meyer Olkin (KMO) extraction method that Eigen values less than 1 are not significant, the ordinary component of the fertility determinants reveals that the variables have been collapsed into five major components of factors affecting the fertility of the ever married women in Awka town. The cumulative percentage of 70.39% shows that the variables explained 70.39% of the variation in the fertility of the ever-married women in Awka town.

Table 3: Rotated Component of the Fertility Determinants among the Ever Married Women in Awka Town

37 ' 11	Component						
Variable	1	2	3	4	5		
X_1	(.850)	.033	.063	.137	131		
X_2	069	(700)	056	.493	102		
X_3	.119	.037	(.870)	.063	078		
X_4	.193	(.750)	391	293	028		
X_5	.113	011	102	.011	068		
X_6	.198	.025	(.725)	021	.040		
X ₇	067	.398	017	(.905)	.107		
X_8	.090	083	.001	046	.611		
X_9	076	.008	.426	298	(.630)		
X_{10}	.061	193	085	.516	(651)		
X ₁₁	.082	055	.290	036	.161		
X_{12}	048	.147	007	.179	.506		
X_{13}	.029	.365	042	(.780)	046		
X_{14}	.063	031	.274	.014	.081		
X ₁₅	(.840)	.028	.131	087	.120		
X ₁₆	.015	.254	.044	001	083		
X ₁₇	(.860)	.026	.038	.077	058		
Eigen Value	4.527	2.379	2.205	1.490	1.366		
% of Variance	26.629	13.994	12.968	8.767	8.034		
Cumulative %	26.629	40.623	53.591	62.358	70.391		

Note: Loadings are significant at +/ - 0.60 (significant loadings are in parenthesis).

However, owing to the random nature of the correlation matrix, a definite association between the variables cannot be inferred. Thus, since the rotation method ensure the spread on variables from lower to higher components; the rotation method of principal component analysis was employed to identify the variables with significant correlation among the 17 variables. Consequent upon this, the significant variables (based on the threshold of \pm 0.60) were rotated and this gave rise to Eigen values of: 4.527, 2.379, 2.205, 1.490 and 1.366; percentage of variance of: 26.629, 13.994, 12.968, 8.767 and 8.034; and cumulative percentage of: 26.629, 40.623, 53.591, 62.358 and 70.391. The result of the rotated component matrix is shown in Table 3. The 17 variables were collapsed into 5 new variables. These variables are:

Menarche/Age at first marriage and birth variable has high positive loadings on three variables: age at first marriage (0.350), age at menarche (0.840) and age at first birth (0.860). This new variable has a total loading of 4.527 and explains 26.629% of the variation in the fertility of the ever married women in Awka town, and a cumulative percentage of 26.629. This new variable defines the age at menarche, marriage and first birth of the ever married women in Awka town.

Menopause/Coital frequency variable shows a high negative and positive loading on two variables – menopause (0.700) and coital frequency (0.750). The new variable has an Eigen value of 2.379, percentage variance of 13.994 and cumulative percentage value of 40.623. The new variable, thus, defines the menopause and coital frequency of the ever married women in Awka town.

Breast feeding/birth spacing variable shows high positive values on two variables; average length of breast-feeding (0.870) and average length of birth spacing (0.725) with Eigen value of 2.205, percentage variance of 12.968 and cumulative percentage of 53.591. This new variable explains the average length of birth spacing and breast-feeding among the ever married women in Awka town.

Education/job classification variable reveals high positive values on two variables. The variables are; educational level (0.905) and job classification (0.780). The education/job classification variable has Eigen value of 1.490, percentage of variance of 8.767 and cumulative percentage of 62.358. This new variable describes the women's level of education in relation to the type of job they do.

Value of son/daughter variable shows` high positive and negative loading on two variables – value of a son (0.630) and value of a daughter (0.651). The new variable has an Eigen value of 1.366, percentage variance of 8.034 and cumulative percentage of 70.391. This new variable describes the value the women attaches to the sex of children.

It can therefore be deduced from the foregoing that the five new variables that emerged from the collapsing of the 17 selected variables explained 70.391% of the variation in the fertility of the ever married women in Awka town. The remaining are redundant and unexplained as they only contributed a residual variation of 29.609% spread across them. Consequently, these variables are the main fertility determinants among the women. These new five variables are then employed in the regression analysis to determine their contribution to the fertility of the ever-married women in Awka town. The result of the multiple regression analysis is presented in Table 4.

Predictor Variable	В	Std. Error	Beta	T	Sig
(Constant)	5.199	0.046	•	112.495	0.000
Menarche/age at first marriage and birth	1.549	0.046	0.625	33.499	0.000
Menopause/coital frequency	-0.62	0.046	-0.025	-1.332	0.183
Breast feeding/birth spacing	0.408	0.046	0.165	8.835	0.000
Education/job classification	0.489	0.046	0.197	10.572	0.000
Value of a son/daughter	-0.127	0.046	-0.051	-2.740	0.006

Table 4: Coefficients in the Multiple Regressions Analysis

Dependent variable: Number of children ever born

Table 4 depicts the contribution of the variables to the fertility of the ever-married women in Awka town. It is therefore evident from Table 4 that menarche/age at first marriage and birth variable contributed 0.625, menopause/coital frequency variable = -0.025, breast feeding/birth spacing variable = 0.165, education/job classification variable = 0.197 and value of a son/daughter variable = -0.051 to the variations in the fertility of the ever-married women in Awka town.

Furthermore, the constant, 5.199 represents the value of Y (number of CEB) when menarche/age at first marriage and birth variable are zero. It follows that for each unit increase in the 5 new variables, Y will increase by 0.625, decreased by 0.025, increase by 0.165, increase by 0.197 and decrease by 0.051. Hence, menarche/age at first marriage and birth, made the highest contribution (0.625), while menopause/coital frequency made the lowest contribution (-0.025). The multiple regression model determined from the study is given as:

$$Y = 5.199 + 0.625X_1 - 0.025X_2 + 0.165X_3 + 0.197X_4 - 0.051X_5...$$
 (1)

V. DISCUSSION

Marriage before the age of 18 years have adverse consequences on a woman and by extension the child, that is, if the woman starts procreating early. The result of the present study revealed that women who married early, had early age at menarche and consequently resumed child bearing at an early age. This explains why age at first marriage, age at menarche and age at first birth made the highest contribution to the fertility of the ever-married women. The findings of previous studies are in line with the present result (Bates et al., 2007; Kumar, 2007; Ertem and Kocturk, 2008). Ertem and Kockurk found that girls are considered marriageable some years after their menarche, while Bates et al. found that in settings were early marriages are encouraged, early child bearing also persists.

Females who are uneducated and who are not gainfully employed marry early and give birth to more children than those who are educated and who do jobs that fully demand their time (Aryal, 2007). Thus, the fact that majority of the women in the present study are not educated and also do jobs (trading) that do not fully demand their time can be adjudged as the reason that education and job classification --made the second highest contribution to the fertility of the ever-married women.

Breast-feeding prolongs the period of post-partum amenorrhea and suppresses ovulation. However, this period of infecundity is typically only about 2 months among lactating mothers (Konner and Worthman, 1980). Breast-feeding is a natural contraceptive which keeps fertility lower than it would otherwise be (Weeks, 1999). In the absence of some method of contraception, decline in breast-feeding would, of course, increase fertility by spacing children closer to one another. Since majority of the women in the present study breast-fed their children for only 7-11 months and observed one year birth-spacing, it therefore suggests that majority of them relied on breast-feeding as a natural contraceptive, hence, they probably become pregnant when they least expected.

Traditional beliefs in most parts of Nigeria have continued to remain very influential especially in the rural areas where ignorance still holds sway and slightly in the urban areas as some men and/or women who hold to such beliefs have gradually moved due to rural-urban migration. According to Ikenga (1981), aside the traditional beliefs, there is the continuing resilience on ancestral birth order – such as to marry many wives and to give birth to many children. Okafor (2007) noted that in recent years, the surprising resurgence of such beliefs and practices have contributed to the rising fertility levels. Similarly, Umoh (2001) asserted that in most parts of Igboland where land is held communally, one of the ways to gain access to land is to have sizeable families consisting of a good number of sons. The sons are the rightful ones to perpetuate the family title to land. Because women lack inheritance right or loose the right to use land upon the death of a husband, they want children – sons to ensure that they are not deprived of their source of livelihood – land. These practices which encourages high fertility connotes that sons are valued more than daughters. This statement also encapsulates the findings of the present study with respect to the fertility determinant, value of a son and a daughter.

Childbearing, according to Bhende and Tara (2003) involves a series of physiological events, starting with the union of the ovum and the sperm at the time of heterosexual intercourse resulting in conception, and terminating with the successful gestation of the foetus and finally childbirth. Bhende et al. further noted that the regularity of sexual intercourse will influence the likelihood of a pregnancy, particularly if no contraception is used and if the woman has not attained the age of menopause. In general, the more often a couple has intercourse, the more likely it is that the woman will get pregnant, primarily because it increases the chance that intercourse will occur during the fertile period of the menstrual cycle. This assertion by Bhende and Tara can be said to support the result of the present study as 85.9% of the respondents have not reached menopause and 81.5% of them have intercourse at least 5 times per week. This definitely have significant effect on the fertility level of the ever-married women.

VI. CONCLUSION AND RECOMMENDATIONS

This study provided a useful account of the relationship between the recomposed fertility determinants and the fertility of the ever-married women in Awka town. Of the 5 recomposed fertility determinants, age at first marriage, age at menarche and age at first birth made the highest contribution to the fertility of the ever-married women. Thus, the consequent increases in the CEB have the possible implication of increase in poverty, crime, street cultism, conflicts, sexual mores and above all only few of the women with large family size develop their desired entrepreneurship. This is because according to Nwoye (2007) such family workload and the multiple roles gives rise to inadequate time on the part of the women for entrepreneurship. More so, while it may not be possible to generalize the results for the whole of Nigeria, nevertheless, since the urban survey location shares common reproductive values, childbearing practices, household survival strategies and economic systems with other Igbo cities in South-Eastern Nigeria, it seems logical to generalize the findings only for the Igbo society.

Owing to the findings of the study, the following are recommended:

- 1. Married men and women should be encouraged to increase the average length of breastfeeding to at least one year and maintain at least two year birth spacing. This will not only increase the length of birth spacing but will also enhance the equalization of birth rate and the rate of development. Besides, this will also, by extension, bring to the fore the advantages of smaller family size over large family size.
- 2. Parents who are seeking for a particular sex of children should be encouraged to resort to child adoption rather than prolonged child bearing. This measure is expected to control prolonged child bearing, militate against high birth rate and consequently allow such women ample time and strength to be involved in successful entrepreneurial activities.
- 3. Concerted effort should be channeled towards girl child education up to secondary school and higher institution levels, and increased and better employment opportunities for women so as to reduce early marriage, increase childbearing age, reduce birth rate and consequently help them to develop the

capabilities to meet the challenges imposed on them by the unequal access to socially and economically valued opportunities.

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