Asmerom Kidane

Unwanted Fertility and the Demand for Family Planning Services in Northwest Ethiopia

1. Introduction

MANY less developed countries including Ethiopia are experiencing very high rate of population growth. In Ethiopia the population is growing at 2.9 percent per year[1] implying the doubling of population every 24 years. This high rate of population growth along with the extensive utilization of the land and the corresponding disequilibrium in the ecological system has resulted in a rampant drought and famine in most parts of the country, particularly the North and the North West. Many ecologists and demographers believe that if there had been some type of population control such a natural calamity would not have reached the extreme magnitude that it has.[1] Between 1984 and 1985 more than seven million Ethiopians, mostly in the North and North West, are affected by drought and up to one million are expected to die with in a few months. Demographers contend that if family planning services had been introduced much earlier, such a serious calamity would have been partially averted. There is even an argument that the shortage of supply of family planning services and not the demand for them is a major contributor to the accelerated rate of population growth.

Most of the literature related to population growth and family planning

1. Central Statistics **Office** (1980) **page 2.**

2. There is not much reference on the relation between population growth and natural calamity except those statements made by Maithus. However the-negative effect of population growth and economic development has been elaborated upon by prominent demographers such as Coale, Demeny, S. Enke, etc.

services stress that the voluntary practice of birth control is directly related with the stage of the economic and social development of the society under study. The prevalence of low fertility in the economically advanced Northern Hemispheric countries and high fertility in the economically backward Southern Hemisphere is often cited to demonstrate the fertility-development link.

In this paper an attempt will be made to show that economic and social development may not be a necessary condition for the voluntary control of fertility. We will try to show that supply constraints and not the deficiency of demand for family planning services as one of the reasons for high fertility in North West Ethiopia. We will try to analyze the demand for family planning services by measuring the extent and magnitude of unwanted fertility among married women in the area under study.

Most studies on the determinants of family planning consider socio-economic variables only and do not take into account tastes and preferences of mothers. When one deals with a theoretical formulation of a hypothesis in the social sciences, the inclusion of tastes and preferences is rather essential. The study of unwanted fertility, which is essentially an index of tastes and preferences, will definitely enhance one's understanding on the determinants of fertility.

The importance of studying the extent and magnitude of unwanted fertility has been emphasized by prominent demographers. To this effect C. Westoff states.

> An important indicator of the need for improved fertility regulation is the extent of unwanted fertility perceived by women of reproductive age. . . . The prevention of unwanted births would reduce a country's rate of natural population increase since it would decrease the life time fertility of women.[3]

Thus if one agrees that a high level of unwanted fertility implies a higher demand for family planning services with the consequent decrease in the natural rate of population growth, then one ought to measure the magnitude of unwanted fertility.

2. The Sample

In 1982 a demographic survey was undertaken in the administrative region of Gonder in Northwest Ethiopia. A sample of 734 married women along with 279 men was drawn using a stratified cluster sampling. The sampling frames were available from a newly organized peasants'as well as Urban Dewellers' Association. The region was first divided into urban and rural areas and the respondents were selected from both. Out of 734 married urban dewellers 234 were frequent visitors to family planning services, while the remaining 500 were not. The

3. **Westoff, C.** (1981) page 43.

study on unwanted fertility is confined to these 500 mothers. In the subsequent analysis, it may be noted, total respondents, are less than 500. This is because some of the respondents declined to answer some of the questions or their responses were not properly coded.

Preliminary findings of the study reveal that the level of living in the area is very low, only 30 percent of the area is arable. Most of the area within the arable land is overutilized, overgrazed and over populated. Basic demographic indicators show that the area is "demographically" backward. Infant and child mortality rates are as high as 153 and 205 per 1000[4] and the average age at marriage, age at first birth are only about 16.4 and 17 years[5]. The educational system of the area follows that of the whole nation. The system is made up of four steps namely elementary education of six years duration, junior secondary of two years duration (grades 7 and 8), senior secondary of 4 years (9 to 12) duration and finally post secondary or college level education.

Before the Ethiopian revolution only about 8.6 percent of the people in the area were literate. Beginning in 1979, the government had undertaken an all-out effort to eradicate illiteracy from the nation and the result had been very successful, En the very short span of time the literacy rate has increased to about 50 percent. The sampled mothers had an overall literacy rate of 36.8 but ooly 11.7 percent had education beyond the elementary school level[6].

3. Some Consistency Checks

As the aim of this paper is to measure the extent of unwanted fertility, the question that will be a basis for this study is whether a mother's last birth was wanted or not. The validity of responses based on categorical data are always questioned by social scientists. For example, Westoff raises specific questions that tend to throw some doubt on mothers' responses on unwanted last birth[7]. These issues include the randomness of responses, whether the respondent is giving a response genuinely or simply to impress the interviewer, whether the same respondent will give the same answer if asked at a later time and whether the extent of unwanted fertility is related to the sex of last child. Morever, respondents especially those in less developed areas arc not used to considering hypothetical cases such as questions of unwanted last birth and questions on ideal family sizes. The responses may thus be questionable. In general these and other problems related to attitudinal responses in general and to questions relating to unwanted births in particular cannot be resolved once and for all.

4. **Central** Statistics **Office** (1974) page 73.
5. Kidane, *et al* (1983) page 5.
6. Kidane, *et al.* (1983)_page 4.
7. Westoff, C. (1981) page 44.

The other point that needs to be raised is whether unwanted fertility implies the demand for family planning services. As the aim of this paper is to assess the need for family planning services through the measurement of unwanted fertility, the best way to check the validity and reliability of responses on unwanted fertility would be to devise consistency checks. The device that will be applied here is to relate unwanted fertility rates with other indicators of fertility control within a given questionnaire. In this paper, the respondents' attitude on unwanted last birth will be crossclassified with the following variables namely:

(a) Actual and desired number of children
(b) Actual and desired interpregnancy interval
(c) Ideal time for conception

In general, if one gets high actual births among mothers whose last child was unwanted compared to those whose last birth was wanted, the finding may suggest that the last unwanted birth was a reflection of a mother's wish to control fertility voluntarily. This argument may be further strengthened if desired number of births among mothers whose last child was unwanted is smaller than those mothers whose last birth was wanted.

A second consistency check is to cross classify mothers' responses on the knowledge of optimum time for conception against the excess of actual over (he desired interpregnancy interval. *This classification will be confined to* mothers whose last birth was unwanted, If there is a positive association between excess of actual over desired interpregnancy interval against high percentage of lack of knowledge on optimum time for conception, then the information on unwanted last birth could be identified as a genuine desire to control fertility through child spacing.

Table 1 shows the extent of actual and desired number of children for both groups of women while Table 2 shows the cross classification between the knowledge on the optimum period for conception and the excess of desired over the actual interpregnancy interval.

Table 1 shows that the age specific desired number of children among mothers whose last birth was unwanted is less than the rest This is verified by the ratio shown in Column 5 of Table 1. The Table also shows that the average age specific actual number of children to mothers of unwanted last birth is more than *the* other group. *The difference is* more pronounced among mothers aged 35 and above. Even though it may not be a perfect consistency check it does indicate that the last unwanted birth is an index of the unmet demand for family planning services.

Probably a much stronger consistency check is shown in Table 2. The table shows that 47% of mothers had excess of actual over desired interpregoancy interval while only 12% had the reverse. Out of the 47%, 37% had little or no

TABLE 1-DESIRED AND ACTUAL NUMBER OF CHILDREN AMONG THE TWO GROUPS OF WOMEN

Age	Last Child Wanted		Last Child Not Warned			
	Desired"	Actual	'Desired	Actual	' Col .1 / Col.3	Col. 2/Col, 4
	1	2	3	4	5	6
15-19	5.40	1.20	3.14	1.13	1.72	1.06
20-24	5.00	2.18	4.79	2.00	1.04	1.09
25-29	5.26	3.62	4.70	3.48	1.12	1.04
30-34	6.30	4.52	5.56	4.96	1.13	0.91
35-39	7.43	6.05	6.52	6.88	1.14	0.88
40-44	8.70	6.88	7.07	7.38	1.23	0.93
45-	8.93	6.58	7.44	7.1?	1.20	0.92
Mean	—	—	—	—	1.23	.98

TABLE 2- EXCESS OF DESIRED OVER ACTUAL INTERPREGNANCY INTERVAL AND KNOWLEDGE OX OPTIMUM PERIOD FOR CONCEPTION AMONG MOTHERS WHOSE **LAST CHILD WAS NOT WANTED***

	D< A	D> A	D> A	
Right knowledge	.10	.04	.02	.23
Little knowledge	.26	.27	.08	.61
No knowledge	.11	.10	.02	.16
	.47	.41	.12	1.00

*Women were asked on the optimum period for conception after menstruation. Those who said immediately after the end of menstruation period were classified as those with 'no knowledge', those who stated between 12 and 6 days after the end of the period **were** classified as women with the'right knowledge.* Those who give other days were classified as those with 'little knowledge'.

knowledge of optimum time for conception. Among those who had excess of desired over actual interpregnancy interval 10% had little or no knowledge of optimum time for conception. The result suggests that women who prefer a wider interpregnancy interval would not do so because they do not seem to be aware of the optimum time for conception or they may be forced into sexual unions against their will.

Besides verifying that the information on unwanted last birth is consistent andean be analyzed further, Tables 1 and 2 strongly suggest that these above variables, which are indicators of birth control, reflect the increasing demand for planning services in general and birth control in particular. The above results tend to contradict the claims made by some skeptics that in many developing countries women perceive the number of children as being determinea by conditions out of their immediate control such as chance or fate.

4. Measures of Unwanted Fertility

The extent of unwanted fertility will be measured using two methods namely the age specific unwanted last birth rate which is a simple ratio of the women whose last birth was unwanted over all the women in the sample. The second method would be to estimate the number of unwanted births in terms of parity equivalents.

The first method namely the age specific unwanted last birth rate is given in Table 3. The values range from as low as 25% among mothers aged 45 years

TABLE 3-AGE SPECIFIC UNWANTED LAST BIRTH RATE

Age of Mothers	*15-19*	*20-24*	25-29	*30-34*	*35-39*	*4044*	*45-*
Last Birth Wanted	17	54	56	64	49	27	41
Last Birth unwanted	11	40	26	26	22	17	14
Ratio	0,39	0.43	0.32	0.29	0.31	039	0.25

and above to a high rate of 43% among mothers aged 20-24 years. In fact both 15-19 and 20-24 years old women have a high value of last unwanted birth. Normally one would expect a monotonically non decreasing unwanted last births especially from the ages 20 and above. The logic behind this expectation is the relatively high demand for family planning services by mothers at later ages of reproductive periods. However Table 3 does not seem to exhibit the monotonically non decreasing trend with age. This result may not be unexpected among women in Northwest Ethiopia. The high rate of unwanted last birth among 20-24 and especially among 15-19 years old mothers could be a reflection of women being forced into earlier marital unions against their will. This argument is reinforced by the fact that the higher unwanted last birth among 20-24 years old mothers over that 15-19 years old can be attributed to the tendency of teenage mothers in African societies to overestimate their ages once they are married. This problem has been verified by Coale and Demeny,

Van de Walle and others.[8] In genera! Table 3 reflects a high rate of unwanted last birth at every age.

A better method of estimating the magnitude of unwanted last birth is to use the method developed by C. Westoff.[9] Unfortunately this method could not be applied to the study on Northwest Ethiopia's survey because a question on duration since last birth which is essential for the estimation of the stated method was not included. An alternate, although rough, method is applied to estimate numerical value of unwanted fertility by comparing parity in the absence and presence of unwanted fertility. This is done by defining a minimum and maximum possible reduction in fertility.

To get the minimum effect one has to assume that the last unwanted birth is the only unwanted birth. This unwanted birth is reduced from the total number of children everborn to mothers at the various age intervals and parity values are then reestimated. The maximum reduction is assumed when the parity values of mothers whose last birth was unwanted arc the actual values less one up to the age 30, which remains constant thereafter. New parity values will be reestimated and compared with the original parity of all women. Obviously, this method is less scientific; still it will give as a rough estimate on the magnitude of unwanted fertility throughout a mother's reproductive ages.

Beside on the above assumptions, the results are shown in Table 4. The table shows that assuming the the minimum effect takes place, the decrease in parity will range from as high as 33% among the 15-19 years old to a low of 4% among 45 years and older mothers. This suggests a high demand for family planning services among the 15-19, 2024 years old mothers and to some extent among older women. The average reduction is about 11%. When the maximum effect was estimated, the decrease in parity is considerable among the most productive age groups of 15-19 and 40-44 years. The decrease in parity among these age group is 33% and 27% respectively. The "average" reduction in parity is shown in column 10, where the overall average reduction in parity is about 16%.

Taking "the average" reduction of parity as 16 percent, it is converted into crude birth rate equivalent. This is compared to crude death rate believed to prevail in the area under study at the time of survey. Based on the study by the Central Statistics Office of Ethiopia, the crude birth and crude death rate of the area is 51.5 and 20 respectively,[10] As a result of avoiding unwanted fertility the crude birth rate is reduced to 43.3- Thus in the absence of substantial in and out migration, the growth rate would have been 23.3 instead of 31.5 if family planning services were provided. This implies that the population of the area will double every 30 years instead of 22 years in the absence of family planning services, It can be argued that this is the lower limit in

8. Brass, *et al.* (1968) page 139.
9. Westoff, C. (I981J page 45.
10. Central Statistics Office (1974) pp. 70-73.

TABLE 4—PARITY VALUES UNDER VARIOUS ASSUMPTIONS

Age	W_u	W_w	P_{iu}	P_{iw}	P'_{iT}	P_{iT}	$\left(1-\frac{P'_{iT}}{P_{iT}}\right)P''_{iT}$	$1-\frac{P''_{iT}}{P_{iT}}$	Col. 7 + Col. 9/2
	1	2	3	4	5	6	7	8	9	10
15-19	11	17	1.13	1.20	1.17	0.78	0.33	0.33	0.33	.33
20-24	40	54	2.00	2.18	2.10	1.68	0.20	0.20	0.20	.20
25-29	26	56	3.48	3.62	3.58	3.26	0.09	0.09	0.09	.09
30-34	26	64	4.96	4.52	4.65	4.36	0.06	3.93	0.10	.08
35-39	22	49	6.88	6.05	6.31	6.00	0.05	4.94	0.22	.14
40-44	17	27	7.38	6.88	7.07	6.87	0.03	5.18	0.27	.15
45-49	11	41	7.13	6.58	6.72	6.47	0.04	5.53	0 18	.11
Mean Reduction							.11		.20	.16

Notes. W_u W_w = Number of mothers whose last birth was unwanted and wanted respectively.

P_{iu}, P_{iw} = Parity values of mothers whose last birth was unwanted and wanted respectively.

P_{iT} = Parity value of all mothers.

P'_{iT} = Parity value of all mothers after the last unwanted birth was excluded (minimum possible reduction).

$\left(1-\frac{P'_{iT}}{P_{iT}}\right)$ = Proportionate reduction in parity u ıder the minimum reduction assumption.

P''_{iT} = Parity value of all mothers under the assumption of maximum possible reduction.

$\left(1-\frac{P''_{iT}}{P_{iT}}\right)$ = Proportionater eduction in parity under the maximum reduction assumption.

fertility reduction that can be expected from the provision of family planning services. It is conceivable that the last unwanted birth rate may be an underestimate, because in traditional, and religious societies like Northwest Ethiopia women may not be free to express the opinion that last birth was unwanted.

5. Determinants of Unwanted Fertility

Six socio-economic variables which are believed to have some association

with the extent of unwanted fertility are considered. For the sake of convenience a pair of related variables are classified and their relation with unwanted fertility discussed. A multiple linear regression relating unwanted last birth with the six explanatory variables is also estimated to check the explanatory power of the independent variables under consideration.

Age at Marriage and Age at First Birth

The variation in the percent of unwanted last birth is cross classified with the above variables and the result is given in Table 5. In general the direction

TABLE 5—UNWANTED LAST BIRTH RATE CLASSIFIED BY AGE AT MARRIAGE AND AGE AT FIRST BIRTH

Age	*Age at Marriage*	*Age at First Birth*
10-15	0.30	047
16-17	0.41	0.42
18-20	0.40	0.33
20-	0.19	0.24

between age at marriage and age at first birth on the one hand and the rate of unwanted last birth on the other is not clearly established. In much of the literature on family planning, unwanted fertility seems to be low among women with earlier age at marriage and age at first birth the reason being that most of the time women at later ages of marriage tend to demand more family planning services. If they cannot get such services they are likely to have *unwanted births.* On the other hand Trussell and Menken have shown that American women who start childbearing early tend to bear more unwanted children.[11]

The results in Table 5 tend to show that mothers in North West Ethiopia tend to have a relatively high unwanted last birth both at earlier ages at marriage and age at first birth. This result may suggest that women prefer to join marital union at later ages. This finding seems to be consistent with the prevailing view that later age at marriage and age at first birth would reduce the extent of unwanted births.

Marriage Duration and Occupation

Closely related to the age at marriage and age at first birth is the association

11. Trussel, e*t al.* (1976) page 209.

between unwanted last birth and marriage duration. Even though one expects a positive association between the extent of unwanted last birth and duration of marriage, such a relation is not shown by Table 6 where marriage duration and occupation characteristics of women whose last birth was unwanted is crossclassified. The highest rate is among mothers who have been in marital union between 5 to 14 years, while the lowest is in both extreme marital duration age groups. The high unwanted last birth among women with long marital duration is to be expected; on the other hand a high unwanted last birth among mothers with shorter duration of marriage may be an indication that women are forced into earlier marital unions against their will. This result is consistent with those on Table 5 where unwanted last birth is cross classified with age at marriage and age at first birth.

TABLE 6—UNWANTED LAST BIRTH RATE CLASSIFIED BY MARRIAGE DURATION AND OCCUPATION*

Occupation	*Marriage Duration*				
	0-4	*5-14*	*15-24*	*25-*	
Housewives	0.06	0.21	0.21	.02	.65
Others	0.10	0.16	0.07	.16	.35
	.16	.37	.29	.18	

*Rates are estimated from among those women whose last birth was unwanted.

Mothers whose last birth was unwanted are also classified by occupation. In the overall sample, 69 percent were housewives while the remaining were mostly traders, shopkeepers and maid servants with a very few in the teaching, health and clerical employment. The percentage of housewives whose last birth was unwanted is 65 percent. This positive association between being a housewife and her last unwanted birth implies that lack of freedom of housewives could result in a high incidence of having unwanted birth.

Educational Level and Residence

Table 7 tries to show if there is a group difference in unwanted last birth by the level of education and residence. The results show that the percentage of the last unwanted birth does not seem to show a significant difference between urban and rural area as the rate is similar to that of the survey. One would normally expect a high rate of unwanted last birth in rural than in urban areas because of the familiarity and availability of family planning services in the latter. The lack of association between residence and unwanted last birth is

TABLE 7—UNWANTED LAST BIRTH RATE CLASSIFIED BY LEVEL OF EDUCATION AND RESIDENCE

	Education Level				
	0	*1-6*	*7-8*	*9*	
Urban	.07	.06	.08	0.12	0.33
Rural	.26	.23	.31	0.27	0.67
	.33	.29	.39	.39	

again to be expected in the survey area as there is modest and inactive family planning services in urban areas and almost no services in the rural areas. The result further confirms the urgent need for comprehensive and active family planning services in the entire region.

The association between the level of education and unwanted last birth is shown in the same Table. Again the expected negative relation between the level of education and the last unwanted birth rate does not seem to hold. Even though the percentage dropped from 33 percent among illiterate mothers to 29% among those with primary education, the rate increased to 39 percent among women with junior and senior secondary school education. Again, in the absence of wide-spread family planning services one need not be surprised at the lack of association between the two variables.

A multiple linear regression of unwanted last birth on the six explanatory variables is estimated. The regression coefficients, their standard errors along with the beta coefficients is given in Table 8. The equation has low explana-

TABLE 8—LINEAR REGRESSION RESULTS ON THE DETERMINANTS OF UNWANTED LAST BIRTH

Variables	*Regression Coefficients*	*Standard Error*	*Beta Coeff.*
Constant	0.623		
Residence	—.030	0.050	—0.030
Occupation	.056	0.055	0.054
Age at Marriage	—.007	0.007	—0.063
Duration of Marriage	—.001	0.003	—0.011
Age at lst Birth	.009	0.005	0.084
Mother education	—.071	0.038	—0.116

$R^2 = 0.193$ $F = 35.766$

tory and predictive power as the six socio-economic variables explain only 19.3 percent of the total variation in unwanted fertility. Such a low explanatory power is not uncommon in similar studies. In a similar study Professor Westoff shows the explanatory power of his equation to be less than 2.5 percent.[12] The beta coefficients tend to show the prevalence of unwanted last births among the literate, those with earlier age at first birth and those with a higher age at marriage.

As the dependent variable is a categorical data, that is, a value of zero is given to women whose last birth was unwanted and a value of one to the other group, the estimated dependent variable can be interpreted as the probability of a mother having last wanted birth. In order to estimate this probability we postulated two types of mothers, namely a "modern" mother and a "traditional" mother. A modern mother is defined as a literate urban resident who is not a housewife, whose age at first marriage and age at first birth is relatively late while her marriage duration is relatively short. A "traditional" mother is the one who does not possess the above characteristics. The result given in Table 9 shows that "modern" mother has a higher probability of having unwanted last birth compared with a "traditional mother. This is because the probability of the last birth being wanted is 0.707 for a traditional mother while this value is 0.488 for a "modern" mother. The result seems to be consistent as "modern" mothers are likely to be more explicit in their response to the question on unwanted last birth than are the "traditional" mothers.

TABLE 9—PROBABILITY OF HAVING WANTED LAST BIRTH BETWEEN "TRADITIONAL" AND "MODERN" MOTHER

	"Modern" Mother	*"Traditional" Mother*
Residence	1	0
Occupation	0	1
Age at 1st marriage	20	14
Duration of marriage	2	22
Age at 1st birth	20	16
Mother's education*	2	0
Prob. of wanted last birth	0.488	0.707

*For mother's education the dummy variables are zero if illiterate, one if a mother read and writes and two if a mother has a formal education.

12. Westoff, C. (1981) page 4.

Conclusion

We have seen that inspite of a low level of economic and social development, women in Northwest Ethiopia have a high demand for family planning services as indicated by the incidence of unwanted last birth. Such a demand seems to be prevalent irrespective of educational, occupational, residential and other differentials. As was stated earlier there is very meagre and relatively inactive family planning programme in the urban areas and practically none in the rural areas; this is so despite the existence of a national medical college in the area under study.

It should also be noted that this is the part of Ethiopia that had been continuously affected by drought and famine during the past several years; the starvation level has reached a critical level during 1984. There is no reason to expect the amelioration of the problem in the near future unless the ecological disequilibrium is restored. The short run solution to this problem would be well conceived and planned resettlement schemes into more fertile but less populated areas. More important, the long run solution will have to be the formulation of a policy directed at voluntary reduction of fertility and population growth. Our finding suggest that there is a considerable demand for family planning services in both rural and urban centers. The establishment of active family planning programmes in Northwest Ethiopia and in other parts of the country could reduce the relatively high rate of population growth. This will in turn reduce in the long run the drought and mass starvation that has characterized the country for the past decade.

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