

*Women's Education and Labor Force Participation and  
Fertility Decline in Iran*

*By*

Amir H. Mehryar  
Institute for Research and Development Planning  
Tehran, Iran

Akbar Aghajanian  
Department of Sociology  
Fayetteville State University  
Fayetteville, NC 28301

Mohamad Tabibian and Farzaneh Tajdini  
, Institute for Research and Development Planning  
Tehran, Iran

*February 2002*

*\*send comments to Akbar Aghajanian :aaghajanian@uncfsu.edu*

## *Women's Education and Labor Force Participation and Fertility Decline in Iran*

### *Abstract*

Education and economic activity are two of the main determinants of women's status. They are also commonly considered as two of the main determinants of fertility decline and demographic transition. Iran has experienced a remarkably rapid fertility decline over the past decade. The decline has surprised many observers both because of its size and tempo and the fact that it started almost immediately after a remarkable rise in fertility during the first decade after the Revolution. The average annual population growth rate, which was 3.4 in 1986 had declined to 1.9 by 1996. Similarly, the total fertility rate, which was estimated to be above 6 in mid 1980s is believed to be just above 2.

Identification of factors that might have contributed to this remarkably rapid decline is of much interest. This paper presents a review of available data on the role played by women's education and labor force participation in this process. Sources of information used include national censuses carried out between 1976-1996, nation-wide KAP surveys conducted by the Ministry of Health and Medical Education since 1988, the large scale population growth estimation survey conducted by the SCI in 1998-1999, and the recently completed DHS survey undertaken by the Ministry of Health and Medical Education.

Results indicate remarkable improvement in the level of education of women and a clearly negative correlation between women's education and fertility. Women's labour force participation rate had declined noticeably after the Revolution. It has risen slightly over the last decade but still remains at below its 1976 level. Nevertheless, there is clear evidence of a negative correlation between women's economic activity rate and their fertility behaviors. On the aggregate level, provinces with high female employment rates have lower fertility and higher contraceptive prevalence rates. On an individual level, too, economically active women tend to have lower fertility rates. Among the economically active women, those identified as "unemployed" have the lowest fertility rates as compared with both the currently employed women and the economically non-active women identified as "homemakers" and "income recipients without work". Women with higher levels of education tend to have lower fertility and higher contraceptive prevalence rates. But, in view of the overall high contraceptive prevalence rate (over 70%) attained by the population as a whole the traditional gap in terms of contraceptive use and fertility between women with high and low levels of education as well as those from rural and urban backgrounds has been very much narrowed. In fact, once the effect of education is controlled, the difference between urban and rural women disappears. The family planning programme would seem to have been particularly effective in meeting the needs

of rural women. A larger proportion of better educated, working, urban women continue to depend on the traditional method of coitus interruptus for contraception.

## *1. Introduction*

Women's status is widely acknowledged as one of the main determinants of fertility decline in developed countries (MacDonald, 2000). Its potential contribution to fertility decline and other aspects of reproductive health in developing countries has also been universally acknowledged. It was singled out for special attention by the International Conference on Population and Development (ICPD, UNFPA, 1994). Education and labor force participation are commonly considered as the main pillars of women's status (Boserup, 1970; Mason, 1986; Whyte, 1978; Kishor & Netzel, 1996).

The potential impact of education on various aspects of behaviour, including reproductive and family planning behaviours, is too obvious to call for any discussion. There is in fact a wealth of data from both developed and developing societies confirming the importance of women's education for fertility decline (United Nations, 1987). On a global level, countries with the lowest rates of fertility are characterized by high levels of literacy and educational attainment by women. In contrast, countries with high fertility rates are distinguished by high rates of illiteracy and very low levels of educational attainment by women (United Nations Development Programme, 2000).

A negative relationship between women's labour force participation and fertility can also be expected on both sociological and economic grounds. From a sociological perspective, women's participation in the labour market is seen as inconsistent with their traditional role as mothers and homemakers. This "role-incompatibility hypothesis" envisages a negative relationship between women's employment and fertility. The intensity of the relationship will depend on the degree of incompatibility. In other words, if economic and social life are structured in such a manner that it is difficult to combine child-rearing and employment, an inverse relationship between fertility and work will emerge. When no such constraints are present, there will be no relationship (UN, 1985). The economic conceptualization of the relationship between women's employment and fertility emphasizes the opportunity cost of children. According to this perspective, as the opportunity cost of children increases due to increased employment opportunities for women fertility will decrease. To the extent that role incompatibility may be viewed as related to rising opportunity costs, the sociological and economic perspectives are quite consistent.

As implied by the theoretical perspectives outlined above, the inverse relationship between women's employment and fertility is conditional upon several other factors and thus may not hold universally. This expectation is actually confirmed by the available evidence. On the one hand, developed countries with very low levels of fertility, although generally characterized by high female labor force participation rates, vary greatly in this respect (United Nations Development Programme, 2000). Nevertheless, increased entry of women into the labour market and the emergence of employment as a serious alternative to traditional role of women as mothers and homemakers are believed to have played a

significant role in fertility transition in these countries. On the other hand, the highest rates of female labour force participation are seen in some sub-Saharan African countries with extremely high fertility rates. Results of the World Fertility Survey (WFS) (United Nations, 1987) and Demographic and Health Surveys (Macro International, 1994, 1996, 1998) indicate that the relationship between women's employment and fertility behaviour is far from a simple linear one. It may vary depending on the nature of the economic activity, its cash outcome, and the circumstances under which it takes place, particularly the level of development of the country (United Nations, 1985). Employment in the more modern formal sectors of the economy (which usually call for some measure of modern education) is more likely to result in fertility decline while engagement in the traditional agricultural occupations and cottage industries may not necessarily do so.

### **Aim of the Study**

The aim of this study was to investigate the relationship between women's education, economic activity, and fertility in Iran.

### **Background**

The Islamic Republic of Iran followed a clearly pronatalist policy, with both ideological and economic underpinnings, during the first decade of its life. The result of this policy was a tremendous rise in fertility rates of Iranian women in both rural and urban areas of the country. This was clearly reflected in the findings of the first census taken after the Revolution in 1986. These indicated that the population of Iran had risen at an annual growth rate of 3.9 since 1976. The total fertility estimates derived from the census (7.2 for the whole country as compared with 6.4 and 9.1 for urban and rural areas, respectively) were equally impressive. Partly in response to the alarmingly high population growth rate revealed by the 1986 census and partly in preparation for the post-war reconstruction plans then under consideration, a frankly antinatalist policy was adopted in 1989 and the long suspended national family planning program was revived and given full authority to pursue the demographic and health targets set by the First Five-Year Development Plan (Aghajanian & Mehryar, 1999a; Mehryar et al, 2000).

The family planning program and other measures taken since 1989 as part of the new population policy have been exceptionally successful both in terms of both raising contraceptive prevalence rates and reducing fertility. According to the Demographic and Health Survey conducted in October 2000, over 72% of eligible women are now using a contraceptive, mostly a modern one, and the total fertility rate has declined to around 2.0 children per woman (as compared with about 7.2 children in 1986, and 2.96 children in 1996) (Aghajanian & Mehryar, 1999b; Mehryar, Tabibian & Gholipour, 2001). During this period Iran has also invested generously in women's education (Mehryar, Farjadi & Abbasi, 1999) and almost all formal barriers to women's participation in the labour market have been removed. Yet, despite considerable improvements in women's literacy and educational attainment, their labour force participation rate has remained at a relatively low level. Just over nine percent of women aged 10 years and over (as compared with 61% of men) were found to be economically active, that is currently employed or unemployed but looking for employment, in 1996 (Mehryar & Farjadi, 2001). It is of more than academic interest to see how these changes in literacy, education and labour force participation of Iranian women

have affected their fertility and contraceptive use rates.

### 3. Sources of Data

Data used in this study come from the general censuses of population conducted between 1956-1996, particularly the 1996 census (SCI, 1998) and two large-scale sample surveys carried out by the Statistical Centre of Iran and the Ministry of Health and Medical Education in 1998-1999 (SCI, 1999) and 2000 (MOHME, 2001). The first of these is a nationwide survey aimed at estimating population growth rate and carried out in two phases in 1998 and 1999 by the Statistical Centre of Iran. It covers a sample of over 110,000 households (and a population of over 566,000 individuals) taken randomly to represent both urban and rural areas of the country. The second is an equally large-scale DHS-type survey conducted jointly by the SCI and the MOHME in October 2000. It covers a random sample of almost 114,000 households with a population of 514,000. The sampling of the latter survey was done separately for the urban and rural areas of each of the 28 provinces as well as the Tehran Metropolitan Area. A sample size of 2000 households was envisaged in each of the 57 units thus defined. In addition to the general demographic characteristics covered by the SCI censuses and surveys, the MOHME/SCI survey (referred to as DHSI 2000) includes a great deal of detailed information on various aspects of maternal, child and environmental health and family planning.

### 4. Terminology

In the terminology of the Statistical Center of Iran, “economically active” population refers to all individuals aged 10 years and over who report to have been “*employed*” or “*unemployed, but looking for a job*” during the week preceding the date of census or survey. The economically active population thus consists of two sub-groups: currently *employed* and currently *unemployed* but looking for a job. The *economically non-active population* in turn consists of three main sub-groups: *homemakers, students, and income recipients without work*. A *general activity rate* is calculated by dividing the number of the economically active population (i.e., those *currently employed* plus those *currently unemployed but looking for a job*) by the number of people aged 10+ years. An *employment ratio* is calculated by dividing the number of the currently employed population by the number of the economically active (i.e., employed + unemployed).

*Literacy rate* refers to the proportion of population aged six years and above who can read a piece of newspaper in any language. The literate population is in turn classified by level of formal schooling into the following categories: primary (1-5 years of education), guidance or junior high school (6-8 years of education), secondary (9-12 years of education) and higher education (a university degree, 14+ years of education). A once large but rapidly decreasing proportion of the literate population has attained its literacy through the adult literacy program known as the “*Literacy Movement*”. The program has been particularly effective in raising literacy rates of rural women. A small group of the literate population has attended traditional religious schools. The education offered by these schools varies from basic literacy skills (usually for young women in villages lacking a school) to middle level and advanced studies offered by traditional theological seminaries situated in a number of major urban centres, the most famous of them being the historic cities of Qom and Mashad in Iran and Karbala and Najaf in Iraq. Known as *Howzeh Elmieh* (or *Scholarly Circles*) these

independent seminaries outside the control of the Ministries of Education and Higher Education constitute the main institutions for training Shiite clergy and religious leaders in Iran. Their teachers and students played a major role in the Islamic revolution and currently they occupy high level positions in all government departments as well as the judiciary and legislative branches. Depending on the number of years spent at the *Howzeh*, the educational standing of the graduates of these schools is officially evaluated as the equivalent of the BA, MA, or Doctorate degrees conferred by modern universities.

## 5. Findings

### 5.1. National Trends

Table 1 gives Iranian women's literacy, labour force participation and fertility rates as revealed by the national censuses taken between 1956 and 1996 and the DHS-type survey carried out in 2000. The trend is graphically presented in Figure 1. From these data, it would appear that while the literacy rate of Iranian women has gone up consistently between 1956-1996, their labour force participation rate has changed little over the same period. It has only fluctuated within a narrow range of 8-12 percent. Having risen gradually (from 9.2 to 12.9 percent) between 1956-1976, it fell noticeably (from 12.9 to 8.2 percent) during the first decade after the revolution. Although it has taken an upward trend since 1986, its 1996 value (9.1 percent) was still considerably lower than that for 1976. But according to the DHSI 2000 survey, it has risen considerably since 1996. Its 2000 value (17.3) is almost twice the value obtained in 1996.

**Table 1. Changes in Urbanization, Literacy, Economic Activity, Employment and Fertility Rates of Iranian Men and Women between 1956-2000.**

Year	Urbanism	%Literate			%Economically Active			% Employed			CWR1		
		Total	Male	Female	Total	Male	Female	Total	Male	Female:	Total	Urban	Rural
1956	31.4	14.6	22.2	7.3	47.5	83.9	9.2	46.2	81.5	9.5	790	682	842
1966	38.0	29.4	40.1	17.9	46.1	77.4	12.6	41.9	70.2	11.5	851	746	921
1976	47.0	47.5	58.9	35.5	42.6	70.8	12.9	38.3	64.3	10.8	733	604	855
1986	54.6	61.8	71.0	52.1	39.1	68.4	8.2	33.5	59.5	6.1	858	785	956
1991	57.4	74.1	80.6	67.1	38.1	65.5	8.7	33.9	59.3	6.6	668	592	781
1996	61.5	79.5	84.7	74.2	35.3	60.8	9.1	32.1	55.6	7.9	421	368	511
2000	63.0	81.4	86.8	75.9	42.6	67.8	17.3	35.2	56.7	13.7	315	287	361

Moreover, the labour force participation rate of rural women which had fallen below that of the urban women during the first decade after the revolution, has risen above it again. The period since 1996 has witnessed a noticeable widening of the gap between the activity rate of rural (23.3) and urban (14.0) women. It may be of interest to note that the labour force participation rate of men had also declined consistently (from 83.9 to 60.8 percent) between 1956-1996. This was apparently due to the fact that the population on which labour force participation rates are calculated includes youngsters aged 10-19 and with the rising coverage of secondary education during the past three decades a large

proportion of this age group has been classified as students. But it has risen since 1996 and stood at 67.8 by 2000 which is still lower than the figure for 1986 (68.4%).

Throughout this period, the literacy rate of both men and women has followed an upward trend. The rise is particularly impressive in the case of women. The literacy rate of women had risen from 8 percent to 35.5 percent (as compared with 22.4 to 58.9% in the case of men) between 1956-1976. It had risen to 52.1% in 1986 and stood at 74.2 percent by 1996. It has risen slightly (to 75.9%, as compared with 86.8% for men) between 1996-2000.

On the other hand, the fertility rate (as measured by the child-woman ratio, or CWR) which had shown some sign of decline (from 851 to 732 per thousand) between 1966-1976, went up tremendously (from 732 to 858) between 1976-1986. The fertility reversal coincides with the introduction of a national family planning program in 1966 and its suspension after the revolution (1979). By 1991 there were clear signs of fertility decline (from a CWR of 858 to 668). This downward trend became more precipitous between 1991-1996 (when the CWR had fallen to 420). The latter period coincides with the revival of the family planning program (1989). The DHSI 2000 has revealed that the process of rapid fertility decline indicated by the 1996 census has continued resulting in a CWR value of 315. This is equivalent to a Total Fertility Rate (TFR) of 2.0. From Figure 1 it is obvious that the drastic fertility rise between 1976-1986 took place despite the continuing rise in women's literacy rates and the more drastic fertility decline between 1986-2000 was not accompanied by any dramatic rise in their literacy or economic activity rates.

## *5.2 Provincial Variations in Women's Education, Labour Force Participation and Fertility in 2000*

Beneath the overall national trends presented in Figure 1 there are considerable regional variations in all three measures under study. Iran is officially divided into a number of provinces (Ostan) and sub-provinces (Shahrestan) the number of which has changed over the past two decades. In 1996 there were 26 provinces and 252 sub-provinces. By 2000 the number of Ostans had risen to 28. These Ostans and their constituent Shahrestans vary considerably in terms of such major indicators of development as urbanization, adult literacy, access to piped water, electricity, TVs, etc. They also differ markedly with respect to measures of fertility and contraceptive use. To what extent these fertility differences are related to regional variations in women's literacy and labour force participation rates?

The DHS-type survey conducted in October 2000 has provided strong evidence that the sharp fertility decline revealed by the 1996 census has continued across the country. In fact, comparing provincial fertility levels in 1996 and 2000 reveals a reduction of over 30% in the fertility rates of all provinces. The 2000 survey has also revealed a slight improvement in the literacy but a marked rise in the labour force participation rate of women since 1996. Although provincial differences in fertility have been narrowed markedly, there are still wide variations among the rural and urban areas of the 28

provinces in terms of women's literacy and labour force participation. Tables 2 and 3 summarize urbanization, literacy, labour force participation, total fertility rates and a few other indicators of development for the 28 provinces and the Tehran Metropolitan Area as revealed by the DHSI 2000 survey. These are compared graphically in Figures 3 and 4.

**Table 2. Provincial Variations in Female Activity, Education, Fertility and Some Other Indicators of Development, Iran 2000**

Province	Population (1996)	Literacy Rate (%)		% Female Secondary Education	% Female Higher Education	Female Employed (%)	Total Unemployed (%)
		male	female				
MARKAZY	1229	85.60	73.73	11.92	5.00	11.10	9.30
GILAN	2242	85.13	74.33	17.57	5.58	23.80	10.70
MAZANDARAN	2602	86.72	76.79	15.72	6.96	14.30	10.10
AZERBAIJAN E.	3326	84.54	70.03	13.54	4.76	16.80	8.70
AZERBAIJAN W.	2496	82.63	63.23	9.97	4.17	19.40	9.30
KERMANSHAH	1779	84.75	71.95	11.94	4.13	17.90	13.20
KHOUZISTAN	3747	86.67	74.97	12.93	4.78	7.30	17.50
FARS	3817	88.54	79.37	12.84	6.18	11.30	12.30
KERMAN	2004	83.16	76.51	15.43	6.88	11.10	14.70
KHORASAN	6048	85.76	75.16	11.87	4.20	17.90	9.60
ESFAHAN	3923	88.72	78.91	16.26	7.32	18.30	9.80
SISTAN & B.	1723	70.34	54.47	8.25	3.24	5.40	17.50
KURDISTAN	1346	81.28	63.60	9.01	2.67	18.50	12.70
HAMADAN	1678	85.35	73.81	9.35	3.92	10.60	10.80
CHARMAHAL	761	86.90	73.44	12.04	5.21	15.30	12.30
LORISTAN	1584	84.76	72.55	13.48	3.99	9.40	13.60
ILAM	488	85.50	76.09	13.95	3.71	6.40	16.60
KOHLIHOYE	544	85.31	72.82	9.06	3.62	7.30	13.40
BOOSHEHR	744	88.07	78.67	11.27	4.01	9.20	12.40
ZANJAN	901	82.82	68.81	9.93	4.92	28.10	7.00
SEM NAN	501	87.68	80.05	15.15	6.47	10.80	8.60
YAZD	751	88.25	78.99	13.72	7.03	22.60	8.60
HORMOZGAN	1062	83.18	72.15	9.01	2.89	6.00	17.70
TEHRAN PROVINCE	10344	89.13	80.72	16.23	4.43	6.50	10.10
ARDEBIL	1168	83.44	67.91	9.28	2.80	9.80	12.10
QOM	853	88.89	78.48	12.89	4.90	10.70	10.40
QAZVIN	968	87.85	76.73	12.81	5.05	12.90	8.20
GOLESTAN		85.68	73.37	12.25	4.44	20.30	10.60
TEHRAN CITY	10344	94.18	87.41	26.50	12.82	10.10	10.00
TOTAL	60,000	86.79	75.94	14.87	6.05	13.70	11.10

For the 29 provinces, female literacy rate correlates significantly with traditional method use ( $r=.66$ ,  $p<.001$ ) while it shows no correlation ( $r=-.05$ ) with modern method use. Female literacy has its highest correlation with male literacy ( $r=.93$ ). Female employment is positively correlated with both modern ( $r=.24$ ) and traditional ( $r=.18$ ) contraceptive use rates but due to the small sample size none of these correlations are statistically significant. Nor is the small negative correlation ( $r=-.29$ ) between female employment and total fertility rate. Female employment rate correlates highly with male employment

( $r = .71$ ,  $p < .01$ ) but negatively with male unemployment rates ( $r = -.62$ ,  $p < .01$ ). Male employment rate is positively correlated with traditional contraceptive use ( $r = .48$ ,  $p < .01$ ) but negatively with TFR ( $r = -.36$ ,  $p < .05$ ). As expected, it is also negatively related to both male ( $r = -.85$ ) and female unemployment rates ( $r = -.48$ ). Male unemployment rate is, in turn, correlated negatively with traditional method use ( $r = -.57$ ,  $p < .01$ ), but positively with TFR ( $r = .48$ ,  $p < .01$ ).

Male literacy is correlated with the TFR ( $r = -.70$ ) but positively with traditional method use ( $r = .59$ ). Female literacy is also correlated positively with traditional method use ( $r = .66$ ,  $p < .01$ ) and negatively with TFR ( $r = -.58$ ,  $p < .01$ ). From these correlations it may be concluded that, male employment and literacy are as good as female employment and literacy in predicting provincial variations in TFR and traditional contraceptive use rates. While female literacy is able to explain about 43 percent of the variation in traditional method use, male literacy can explain 35 percent of the same. Conversely, while female literacy is able to explain about 34 percent of provincial variations in TFR, male literacy can explain about 49 percent of the same. On the other hand, male employment is able to explain about 23 percent of the provincial variations in traditional method use and 13 percent of those in TFR. But none of these are significantly explained by female employment. Male unemployment is also able to explain 32.5 percent and 23 percent of provincial variations in traditional method use and TFR while female unemployment is able to explain only about 18 percent of the variations in TFR and modern method use.

Using a multiple regression model, it was found that female literacy alone explains about 44% of provincial variations in TFR. Adding female employment results in a 10 percent gain (from 44% to 54.8%) in predictive power. Both correlations are negative and indicate a drop in fertility with rising female literacy and employment. Adding male literacy raises the predictive power of women's literacy and employment to 61.8 percent but due to the high degree of correlation between male and female literacy, the latter loses statistical significance. A combination of female literacy, female employment and modern contraceptive use rate is also able to predict about 61.9% of provincial variations in total fertility. Combining female literacy with female employment and traditional method use helps explain 56.9% of provincial differences in total fertility rate.

### *5.3 Variations at the Sub-Provincial Level*

For the 252 *Shahrestans* (counties) covered by the 1996 census, there is only a slight positive correlation between female activity and literacy rates ( $r = .126$ ,  $P < .05$ ). The correlation between female activity and total fertility rates of these sub-provincial units is low ( $r = -.26$ ) but highly significant ( $p < .000$ ) and negative. Corresponding correlation coefficient between female literacy and fertility ( $r = -.64$ ,  $p < .000$ ) is considerably higher. These correlations indicate that with any rise in women's labour force participation and literacy rates the fertility level of the population tends to decrease.

**Table 3. Provincial Variations in TFR, CPR and Some Indicators of Household Welfare**

Province	TV	Telephone	Car	TFR	Modern Met.	Traditional Met.	All Methods
MARKAZY	89.9	45.2	17.7	1.7	57.6	19.5	77.1
GILAN	88.0	40.5	15.2	1.4	49.8	25.2	75.0
MAZANDARAN	92.9	52.2	19.5	1.7	53.0	25.7	78.6
AZERBAIJAN E.	85.9	53.6	18.8	2.1	58.2	14.5	72.7
AZERBAIJAN W.	87.3	41.0	20.6	2.5	62.2	10.9	73.3
KERMANSHAH	86.4	42.2	16.5	1.8	67.5	7.6	75.1
KHOUZISTAN	85.5	48.7	19.9	2.6	58.4	11.2	69.5
FARS	86.1	42.5	24.9	1.7	59.7	12.2	71.9
KERMAN	81.9	38.5	26.9	2.4	51.9	18.2	70.1
KHORASAN	85.1	35.9	17.4	2.4	50.2	18.0	68.1
ESFAHAN	91.7	58.2	28.3	1.7	56.1	23.4	79.4
SISTAN & B.	55.6	27.7	14.1	4.2	36.4	5.0	41.5
KURDISTAN	85.1	37.2	15.9	1.9	69.9	7.4	77.2
HAMADAN	90.2	39.6	17.7	1.8	63.8	13.4	77.1
CHARMAHAL	81.2	53.4	17.1	2.2	65.6	8.7	74.3
LORISTAN	83.8	37.0	12.0	1.9	63.9	8.6	72.5
ILAM	81.4	50.0	13.0	1.9	66.7	3.5	70.1
KOHILOOYE	61.4	34.2	13.0	2.3	57.9	5.1	63.0
BOOSHEHR	87.5	46.3	18.9	2.2	50.8	12.9	63.7
ZANJAN	86.5	43.5	15.0	2.0	63.6	9.8	73.4
SEM NAN	92.3	57.5	20.5	2.1	53.4	26.8	80.2
YAZD	92.6	65.6	30.4	2.3	54.6	22.3	77.0
HORMOZGAN	74.5	35.5	16.9	2.8	44.8	10.2	55.0
TEHRAN PROVINCE	93.3	38.9	20.4	2.0	57.6	20.9	78.6
ARDEBIL	83.9	45.1	17.3	2.0	66.4	6.8	73.3
QOM	92.1	60.0	19.9	2.6	45.6	27.6	73.1
QAZVIN	89.5	41.2	18.4	1.8	57.9	18.3	76.1
GOLESTAN	89.3	34.8	17.7	2.3	57.9	14.4	72.3
TEHRAN CITY	97.2	75.5	36.2	1.3	52.6	29.0	81.6
TOTAL (WEIGHTED)	87.9	48.3	21.9	2.0	55.9	17.9	73.8

Applying multiple regression it is found that while female activity rate alone can only explain about 7% of the observed variation in CWR, adding female literacy raises its predictive power to 49.9 percent. Male literacy alone can predict about 45.5% of variations in CWR and adding female literacy to it raises its predictive power to 49.6%. Combining female literacy and economic activity with male literacy adds only slightly to their joint predictive power (from 49.9 to 53.1 percent).

#### *5.4. Women's Education and Fertility: An Individual Level Analysis of the 1998 PGE Survey*

The Population Growth Estimation (PGE) survey conducted by the SCI in 1997-1998 provides some interesting information on fertility differentials (as measured by

*cumulative fertility* or the number of children ever born) and education and labour force participation rates of women. The mean number of children ever born (CEB) for the whole sample is 3.34. As expected, there is a significant difference between the figure for urban (3.07) and rural (3.83) women. Looking at the relationship between women's education and cumulative fertility (Figure 5), it appears that the mean number of children ever born by literate women (2.51) is less than one half that of the illiterate women (5.06). This surprisingly large difference applies in the case of both urban (2.53 vs. 4.95) and rural women (2.4 vs. 5.14). In fact, when literacy rate is held constant, the urban-rural difference disappears completely. While the mean number of children born by illiterate rural women (5.14) is slightly higher than that of the illiterate urban women (4.95), the reverse is seen in the case of the mean number of children ever born by literate rural women (2.45) and their urban counterparts (2.53).

A quite similar picture emerges when one compares the cumulative fertility measures of literate women with different levels of education (Figure 6). For the sample as a whole, the mean number of children ever born decreases monotonically with rising levels of education. It is 3.19 for women with primary education only as compared with 5.06 for the totally illiterate women. It falls sharply to 2.13 in the case of women with guidance (grades 6-8) education and to 1.89 in the case of women who have completed the older type of secondary education and to 1.80 in the case of women who have attended the modern type of secondary education. As the contents and level of formal teaching of the two types of secondary school are the same, the observed difference is most probably due to differences in age. The new type of secondary school was introduced in early 1990s and its graduates are more likely to be younger than those of the older type. The lowest level of fertility (1.48) belongs to women with university education. It is less than one half the fertility rate of women with primary education and less than one third that of illiterate women.

The monotonic fall in the mean number of children ever born is seen in both urban and rural areas. But, literate rural women show lower fertility rates than their urban counterparts at all but one level of education. The exception is seen among literate women educated in traditional religious schools whose overall mean number of children ever born (2.54) is smaller than that of women with primary education (3.19). Urban women classified under this title have a fertility level (2.27) that is almost identical with that of women with guidance level education (2.25). The very small group of rural women with this kind of education have a mean fertility value (3.60) which surpasses those of all other educational levels. This is the only case where equally educated rural women have a much higher fertility level than their urban counterparts. The main reason for this difference is probably that, as mentioned above, religious schools for girls in urban areas are likely to be situated in predominantly Shiite areas of the country and cater for better educated women. Religious schools situated in rural areas are usually found in provinces with a predominantly *Sunnid* population (particularly Sistan-Baluchistan and Kurdistan provinces) and are often of very low standards.

### *5.5. Women's Labour Force Participation and Fertility: An Individual Level Analysis of the 1998 PGE Survey*

Comparing economically active and non-active women too, the results of the PGE survey provide some interesting evidence. The mean number of children ever born for the whole group of economically active women is 3.08 which is only slightly lower than that for the whole sample (3.34). The difference would seem to be mainly due to the relatively lower fertility rate of economically active women from urban areas (2.32 as compared with 3.07 for all and 3.18 for the economically non-active urban women). On the contrary, the mean number of children ever born by the economically active women from rural areas (3.91) is larger than that of all rural women (3.83) and the economically non-active rural women (3.81).

As indicated above, the economically non-active group consists of three major subgroups which may differ in such respects as age and education and the differences noted may be due to these factors rather than economic activity per se. In fact if one considers the subgroup of economically non-active women classified as "students", they emerge as having the smallest mean number of children ever born (0.93 in urban areas vs. 0.99 in the rural). This is no doubt mainly due to their younger age. On the contrary, economically non-active women identified as "income recipients without work" have the highest rates of cumulative fertility among both urban (3.42) and rural groups (4.16). These are mostly older, widowed women entitled to retirement benefits or other forms of social security provision. Because such benefits are largely limited to urban areas, the overwhelming majority (202 out of 253) of women falling under this category are from urban areas.

By far the largest subgroup of the economically non-active women are those classified as "homemakers". Comparing this group with the economically active women as a whole it is noticed that they have given birth to a higher mean number of children (3.45) than their economically active counterparts (3.08). This difference is however only seen in urban areas where the mean number of children ever born by a housewife (3.21) is considerably larger than that of an economically active woman (2.31). In contrast, the mean number of children ever born by the economically active women from rural areas (3.91) is larger than that of a rural housewife (3.82). Comparing the two subgroups of the economically active women, it is noted that the mean number of children ever born by those identified as "employed" (3.13) is twice that of women classified as "unemployed" (1.56). The difference is noticeable in both urban (2.32 vs. 1.44) and rural areas (3.94 vs. 2.01). This marked difference between the fertility rates of employed and unemployed women is due to the fact that the latter are much younger than the former group.

## Discussion and Conclusions

The evidence presented above leaves no doubt regarding the important role played by women's education in fertility decline in Iran. Except for the period between 1976-1986, the upward trend in women's literacy has been associated with a downward trend in national fertility level. The marked rise in fertility despite continuing improvement of women's literacy and education during the first decade after the Revolution (1976-1986) is also of much theoretical importance for the topic under study. It clearly indicates how

the impact of women's education and other modernization factors on fertility may be circumscribed by official government policy or lack of it. The experience of Iran in this respect is very similar to those of other developing countries.

Women's education also emerges as one of the main determinants of fertility differentials at provincial and sub-provincial levels. Women's education has not of course worked in isolation from such other forces of modernization as men's education, urbanization, exposure to modern media, etc. In fact there is strong evidence that, as far as fertility is concerned, men's literacy and education is at least as important as women's. But because of the tendency of literate and educated men to marry equally literate women, the relative effect of male vs. female education on fertility is hard to determine. Moreover, the nature of data sources used in this paper did not allow this kind of analysis. The individual level data for 1998 also attests to the importance of women's education as a major factor in individual variations in fertility and contraceptive use. The fact that urban/rural differences in fertility disappear almost entirely after controlling for women's education provides further evidence of the relative importance of education as compared with other modernization variables represented by urban residence in determining fertility and contraceptive use rates. It is also worth noting that the Iranian data presented here and elsewhere clearly show that urban couples are more likely than their rural counterparts to use the traditional contraceptive method of coitus interruptus. Because of this tendency and the fact that the fertility rate of rural population is markedly higher than that of the urban population, the overall contraceptive prevalence rate is not found to be strongly correlated with fertility.

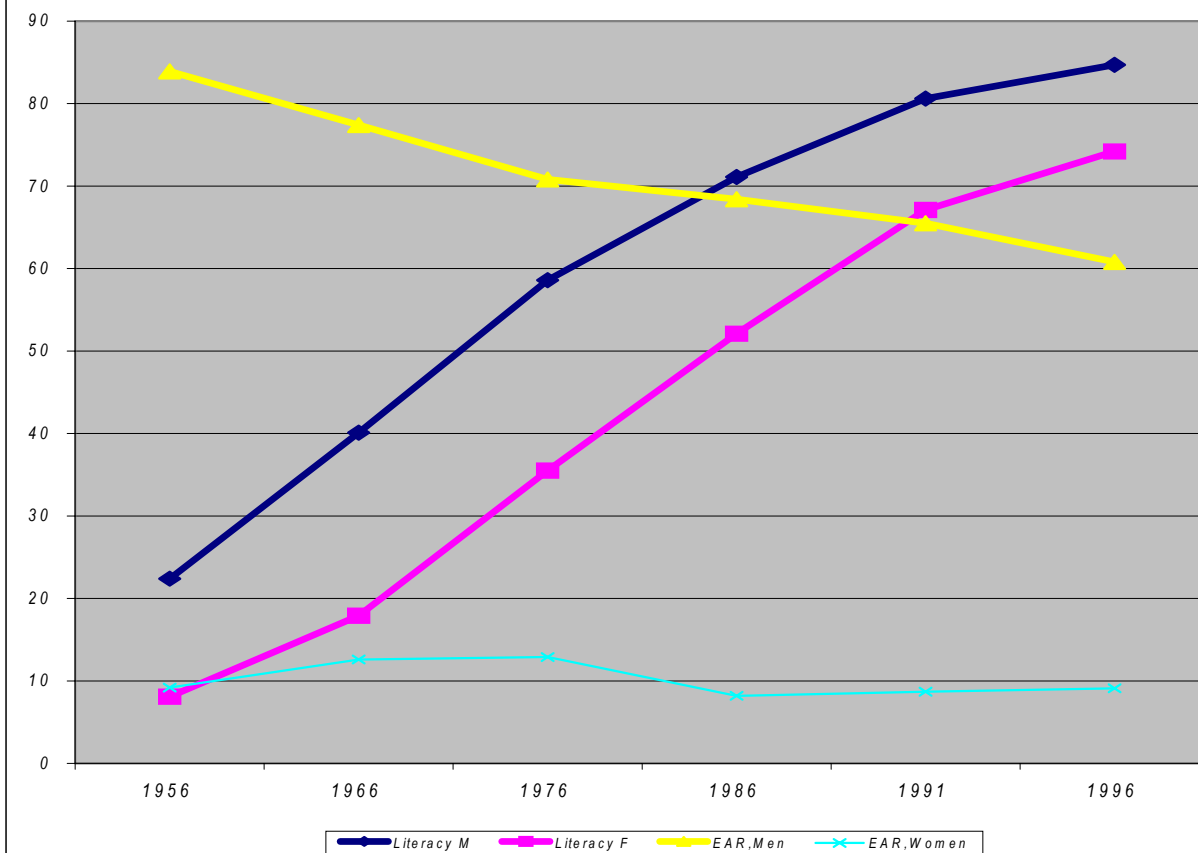
## References

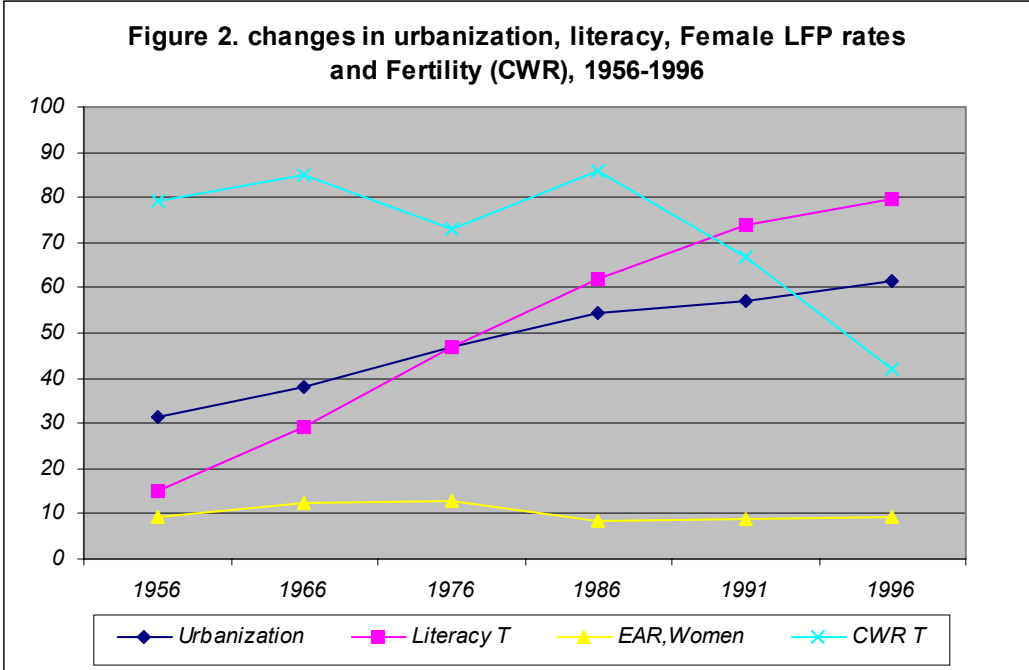
- Adepoju, A. & Oppong, C., eds., 1994. *Gender, work and population*. London: James Currey.
- Aghajanian, A. & Mehryar, A. H. 1999a. "Fertility, Contraceptive Use and Family Planning Program Activity in the Islamic Republic of Iran, 1976-1996". *International Family Planning Perspectives*, 25: 2, 98-102.
- Aghajanian, A., and A. Mehryar. 1999b. 'Fertility transition in the Islamic Republic of Iran: 1976-1996.' *Asia-Pacific Population Journal* 14(1):21-42.
- Anker, Richard, Mayra Buvinic, & Nadia Youssef, eds., 1982. *Women's roles and population trends in the Third World*. London: Croom Helm.
- Boserup, Ester, 1970, *Women's Role in Economic Development*. New York: St. Martin's Press;
- Blumberg, R.L., 1989, *Making the case for the gender variable: Women and the wealth and well-being of nations*. Technical Reports in Gender & Development, No. 1. Washington, D.C.: U.S. Agency for International Development, Office of Women in Development.
- Bruce, J., 1989. Homes Divided. *World Development*, 17 (7): 979-991.
- Dixon-Mueller, R.B., 1993. *Population policy and women's rights: Transforming reproductive choice*. Westpoint, Connecticut: Praeger.
- Hull, Valerie, 1977, Fertility, women's work and economic class: A case study from South East Asia. In Kupinsky, ed., Pp. 35-80.
- Kishor, Sunta & Neitzel, K. 1996, "Women's Work and Workload" In DHS Comparative Studies: The State of Women, Indicators for 25 Countries. Calverton: Maryland, Macro International Inc.
- Kupinsky, S., ed., 1977, *The Fertility of Working Women: A Synthesis of International Research*. New York: Praeger Publishers.
- Lerner, Daniel. 1958. *The passage of traditional society: Modernizing the middle East*. Glencoe: The Free Press.
- McDonald, P. 2000. 'Gender equity in theories of fertility transition.' Paper presented at meeting of the Population Association of America, Los Angeles 20-25 March 2000.
- Mason, K. O., 1986, The status of women: Conceptual and methodological issues in demographic studies. *Sociological Forum*, 1 (2), 284-300.
- Mehryar, A. H., editor, 2001. "*Proceedings of the First International Workshop on the Integrated Approach to Reproductive Health & Family Planning in the Islamic Republic of Iran, Isfahahn, 31 April-13 May 2000*". Tehran: Institute for Research on Planning & Development.
- Mehryar, A. H., Roudi, F., Aghajanian, A., & Tajdini, F., 2001. "*Repression and Revival of the Family Planning Program and its Impact on Fertility Levels in the Islamic Republic of Iran*". Working Paper 2022, Economic Research Forum for the Arab Countries, Iran and Turkey, Cairo, Egypt.
- Mehryar, A. H. & Farjadi, G. A., 2001. "*Female Labour Force Participation in Iran: Trends and Correlates*". Tehran: Institute for Research on Planning & Development. Working Papers Series in English.
- Mehryar, A. H., Farjadi, G. A. & Abbasi, H., 1999. *Government Spending on Basic*

- Social Services and its Share of the GDP and Total Government Budget in the Islamic Republic of Iran.*” Tehran: Unicef.
- Mehryar, A. H. & Tabibian, M., & Gholipour, R. 1999. “*Population Policy Change and Fertility Decline in Iran, 1986-1996: A District Level Analysis.*” Paper presented at the Sixth Scientific Conference, Economic Research Forum, Cairo, Egypt (28-30 October 1999).
- Ministry of Health and Medical Education. 1999. *Country Population Assessment Report: Islamic Republic of Iran.* Tehran, Ministry of Health.
- Ministry of Health and Medical Education. 1999. 2001, DHS Iran: Initial Report.
- Mirzaie, M. 1998. 'Swings in fertility limitations in Iran.' *Working Papers in Demography* No. Canberra: Australian National University.
- Moser, Caroline O.N., 1993, *Gender Planning and Development: Theory, Practice and Training.* London: Routledge.
- Rodriguez, G. & Clelland, J., 1981, “*Socioeconomic determinants of fertility in twenty countries: a multivariate analysis*”. In World Fertility Survey Conference 1980: Record of Proceedings. London, 7-11 July 1980.: Voorburg, The Netherlands: International Statistical Institute, Vol. II, 337-414.
- Safilios-Rothschild, Constantina, 1977. “*The relationship between women’s work and fertility: Some methodological and theoretical issues*”. In Kupinsky, ed., Pp. 354-368.
- Safilios-Rothschild, Constantina, 1982. “Female power, autonomy and demographic change in the Third World”. In *Women’s Roles and Population Trends in the Third World*, ed. Richard Anker, Mayra Buvinic, and Nadia Youssef. London: Croom Helm. 117-132.
- Safilios-Rothschild, Constantina, 1994. “*Agricultural policies and women producers*”. In Adepoju & Oppong, eds. Pp. 54-63.
- Sen, Amratya K., 1990. “*Gender and Cooperative Conflicts*”. In Tinker, ed, Pp. 123-149.
- Statistical Center of Iran. 1987. *Iran Fertility Survey, 1977.* Tehran: Iran Statistical Center. (In Persian).
- Statistical Center of Iran. 1993. “*Bar Rasi Avamel Ejtemai-Eghtesadi Muasser bar Barvari dar Iran*” (An Investigation Socio-economic Factors Affecting Fertility in Iran).” (In Persian). Tehran: Iran Statistical Center.
- Statistical Center of Iran. 1998. *Demographic Indicators of Iran, 1956-1996.* Tehran: Iran Statistical Center. (In Persian).
- Statistical Center of Iran. 2000. “*Results of Population Growth Survey, Stages 1 and 2, 1998-1999*”. Tehran: Iran Statistical Center. (In Persian).
- Statistical Center of Iran. 2000. “*Economic and Social Characteristics of Women in Iran*”. Tehran: Iran Statistical Center. (In Persian).
- Statistical Centre of Iran. 1999. *Iran Population Data Sheet.* Tehran.
- Statistical Centre of Iran. 2000. *Results of the Population Growth Estimation Survey, Phases 1 & 2, 1998-1999.* Tehran: Statistical Centre of Iran (In Persian).
- Statistical Centre of Iran. 2001. *Household Employment and Unemployment Characteristics Survey, 2000.* Tehran: Statistical Centre of Iran (In Persian).
- Stycos, J. M. & R. Weller, 1967, “Female working roles and fertility”. *Demography*, 4 (1) : 201-217.
- Tinker, Irene. ed., 1990. *Persistence of Inequalities: Women and World Development.* New York: Oxford university Press.

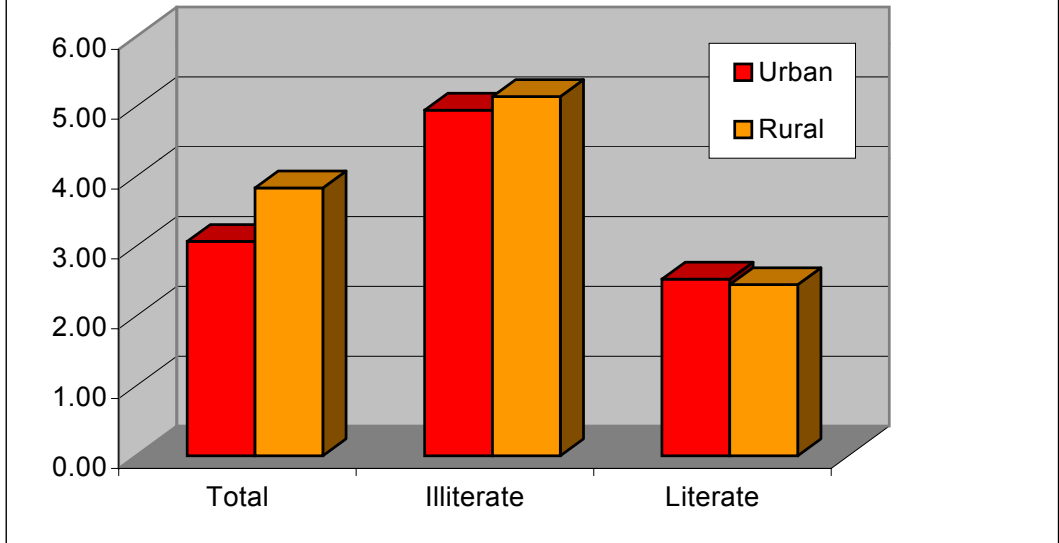
- UNFPA, 1994. *International Conference on Population and Development*. Cairo, 1994. .
- United Nations, Department of International Economic and Social Affairs, Population Division, 1985, *Women's Employment and Fertility: Comparative Analysis of World Fertility Survey Results for 38 Developing Countries*. Population Studies No. 96. New York: United Nations.
- United Nations, Department of International Economic and Social Affairs, 1987, *Fertility Behaviour in the Context of Development: Evidence from the World Fertility Survey*. New York: United Nations. Population Studies No. 100)
- United Nations Development Programme, 2000, Human Development Report. New York: United Nations.
- Ware, H., 1977, Women's Work and Fertility in Africa. In Kupinsky, ed., Pp. 1-34.
- Whyte, M. K., 1978, *Status of Women in Pre-industrial Societies*. Princeton, New Jersey: Princeton University Press.

Figure 1. Changes in Literacy and Economic Activity Rates of Iranian Men and Women, 1956-1996

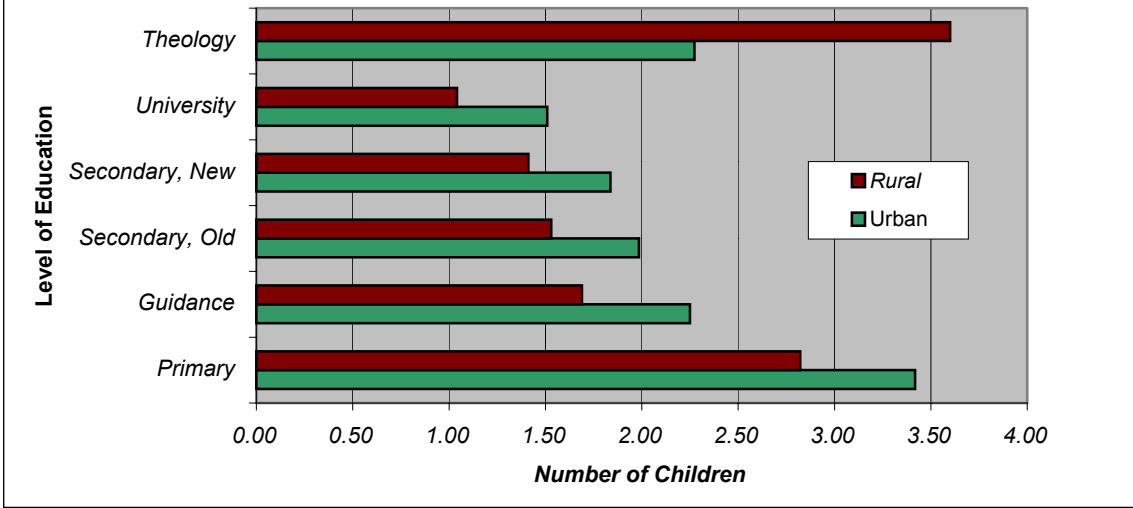




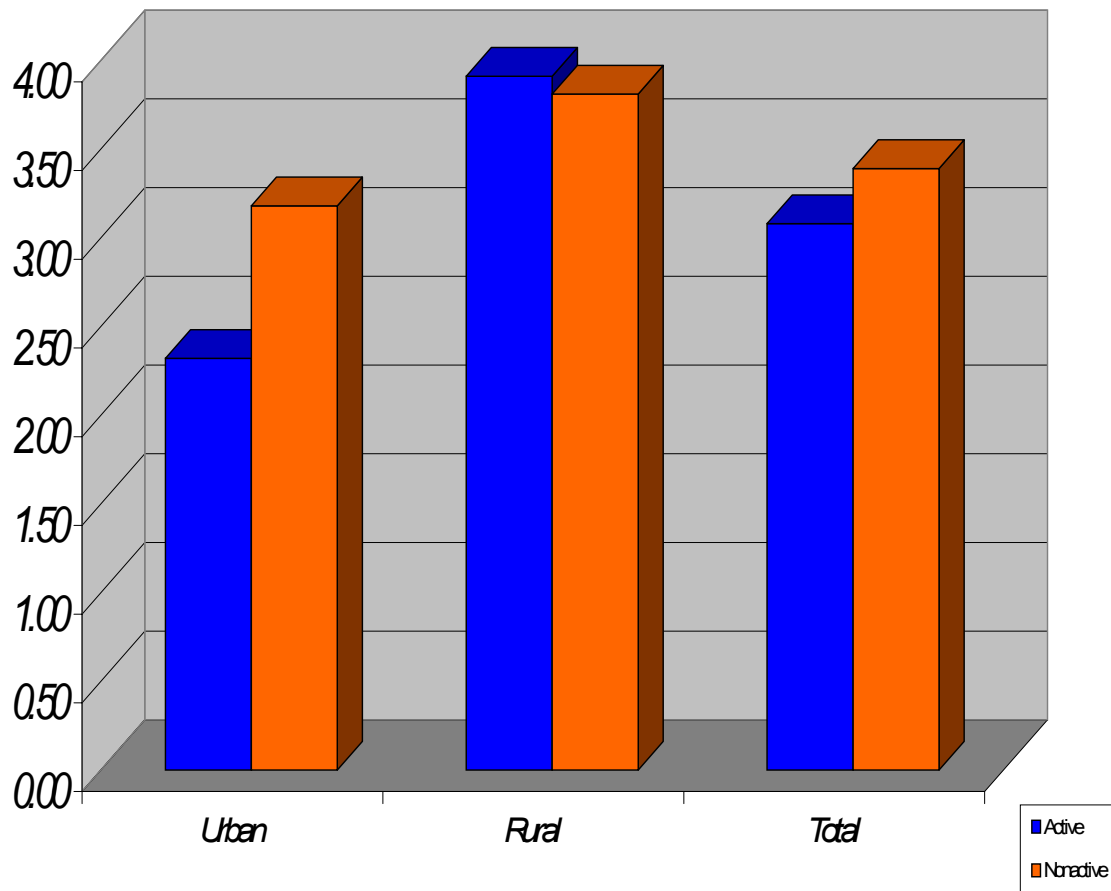
**Figure 3. Mean Number of Children Ever Born by Mothers' Literacy and Urban-Rural Status**



**Figure 4. Mean Number of Children Ever Born by Level of Education of Mother, Iran PGES 1998**



**Figure 5. Mean Number of Children Ever Born of Economically Active and Non-active Women, Iran PGES 1998**



**Figure 6. Mean Number of Children Ever Born by Activity Status & Residence of Mother, Iran PGES 1998**

