South Asian Studies
A Research Journal of South Asian Studies
Vol. 28, No. 2, July – December 2013, pp. 445-4666

Rural-urban Fertility Gap and Fertility Adaptation by Rural to Urban Migrants in Punjab: A Case of Bahawalpur District

Asad Ali Khan
University of Bahawalpur, Bahawalpur

Abstract

Given the relatively slow development and less adequate management of resources, rapid growth of population in Punjab is an issue of vital concern. Significant improvement in the standard of living of its inhabitants may remain just a vision unless population growth is controlled. At the present rates, Punjab would be unable to meet the needs of its population and find jobs for those completing education. Currently almost two-third of its population live in rural areas showing high fertility rate than that of urban population and is playing major part in overall rapid population growth in the province. Resultantly, the quality of population in terms of education, jobs, provision of health and other facilities is adversely affected. So, this issue needs realistic response.

To understand population growth, study of fertility levels, determinants and differentials are key factors. This endeavor, using primary and secondary data, undertakes fertility variations between rural and urban populations of Punjab in general and Bahawalpur district in particular and investigates the causes of fertility differences between them. Fertility levels for each of the rural and urban stratums of population of districts have been computed and compared to point out the fertility gap between them. The study also looks in to the fertility behaviour of the rural to urban migrants. Census data have been used to compute fertility levels and differentials at district level for the entire province. Then the study was supplemented by field survey data of sample district Bahawalpur. This helped out to reach the precise results. Striking differences in the fertility rate of rural and urban areas have been found. Significant inverse correlation between proportion of urban population and fertility rate leads to arrive the conclusion that difference in reproductive behaviour between the women of two polar type community stems mainly from differences in their socio-economic conditions specifically from differences in the literacy rate, level of education, and age at marriage. The study also suggests that rural areas should be the focus of policy formulation and program implementation because major part of the population of Punjab is still inhabited there.

Keywords: Punjab, fertility levels, rural-urban fertility gap, fertility adaptation, fertility determinants, rural-urban migration

Introduction

A widely held earlier documented notion concerning the socio-economic aspects of human fertility is that rural populations are more fertile than urban populations (UN, 1953, p. 85; Mosk, 1980, p. 77) specifically in less developed areas like Punjab. Although, regardless of the overall level of fertility, rural-urban differences have been observed in most societies, but these differences are more significant in less developed societies and their interpretation and meaning have been eagerly questioned (Kuznets, 1974). Some pollsters contended that rural-urban differences are typically small and before the onset of fertility transition arise solely due to lower proportions of married amongst fecund women in urban areas as a consequence of more job opportunities for urban women (Mosk, 1980). However, despite the considerable attention on this topic, little work has been done to relate rural-urban fertility differences systematically to socio-economic development.

Rapid growth of population in less developed areas like Punjab is certainly the out come of high fertility- the exact reproductive performance of women in a population. The study of fertility differentials helps to locate the high fertility groups within the same society. Single variable at a time is taken into account with a view to point out the differences in fertility among various sub-groups of population based on that variable. This study examines fertility gap between rural and urban inhabitants which are the two main sub-groups of same population. As a matter of fact, there may exist specific population groups within the same society with specific norms and values pertaining to family size. Fertility differences among these groups prompt mostly on three grounds to be précised as, the differences in the number of children that couples of various population groups aspire, the differences in their knowledge, attitude and practice (KAP) for fertility control which enable them to accomplish their aspirations, and the differences in the demographic characteristics of each group (Pollard et al, 1987). It has been found that even though some of the variables are more influential than others to cause fertility differences, all are very much interrelated. For example, when the husbands are highly educated, they tend to have educated wives. Higher educational levels are related to higher age at marriage, higher incomes and more gainful occupations leading to higher standards of living. In those families where women are educated, the manipulation of religious creed is likely to be less stiff compared to the families with illiterate women where religious influence can be strong on fertility. It has been determined that fertility levels and pattern differ markedly between the sub-groups of a population. In some cases the fertility rates are higher than the national as well as provincial levels while lower in some others. Since the analysis identifies the grounds that shape reproductive behavior and fertility levels among various sub-groups of the same population, the information so provided can be used as a guideline to point out the changes likely to take place in future. It can give some idea of the future share of each group in total population, and thus, helps to project the future population size of the entire region more adequately. For example, the residents of urban areas of Punjab with higher education and better socio-economic conditions experience comparatively lower fertility and the proportion of population in this group is on the rise, thus this factor could cause the overall birth rate to fall. Furthermore, such kind of

study is also useful from the point of view of the execution of family planning programs as it helps in identifying the high fertility groups on which the program efforts can be focused. Considering such usefulness, the foremost objective of this attempt is to point-out fertility differences between rural and urban areas of the Punjab and to identify chief causes of these differences. It shows how rural-urban fertility differences can be systematically analyzed using measures that can be calculated widely and easily for rural and urban areas of the countries, provinces and districts. It probes questions like how large are the rural-urban fertility differences and what explicates their magnitude? How these differences can be reduced? and so on.

As, population is an old, vast and multidisciplinary subject; it attains vital position in many disciplines like geography, demography, sociology, psychology, anthropology, economics, political science, ecology, biology, public health and so on. As a result, immense work, hitherto, has been done in this field and a massive amount of literature on various aspects of the population is at hand now (see Connelly, 2007; Lesthaeghe and Neidert, 2007; Bongaarts, 1978, 1987 & 2007; Bhattacharya, 2006; Retherford et al, 2005; Feeny and Alam, 2003; Afzal, 2003; Ali and Hussain, 2001; Hakim, 2000; Mahmood and Nayab, 2000; Caldwell, 1976 & 1982; Backer, 1980; Brass, 1975 & 1981; and Clarke, 1972). However, research on fertility situation in the Punjab has been very scanty in the past. Fertility variations in Punjab by place of residence and residential background of the people occupy prominent position among fertility differentials. Though, it is widely held notion that rural-urban place of residence is one of the most outstanding and earliest noted fertility differentials (Bhattacharya, 2006) that might also indicate to the level of economic progress. The views, however, differ markedly about the issue. Some studies have pointed out no consistent fertility differences by rural and urban place of residence in developing countries (UN, 1973: 97). According to 1961 census data of Pakistan, rural and urban fertility was found to be more or less identical (Hakim, 2000: 626). Hashmi (1965) on the basis of a study conducted on Karachi claimed that there was no visible difference between rural and urban fertility. Robinson (1967) found no obvious relationship between urbanization and marital fertility in Pakistan. Karim (1974) also found no visible difference between rural-urban fertility in Pakistan. Yusaf and Retherford (1981) avowed that both rural and urban fertility rates were around seven with a slightly higher fertility in urban areas of Pakistan. Conversely, a number of studies have pointed out higher fertility in urban than rural areas. For example, Goldstein (1973) in Thailand, Omran (1973) in Egypt, and Freedman et al (1972) in Taiwan observed higher fertility in urban areas than their rural counterparts. Another study conducted on Indonesia also asserted similar results (University of Indonesia, 1974). Hakim (2000) while analyzing regional variations in rural-urban fertility based on PFFPS 1996-97 data maintained that in Punjab and NWFP there is no conspicuous difference between rural and urban fertility whereas Sindh and Balochistan show clear differences in this attribute. Contrary to this, Rodriguez and Cleland (1981) in a study based on World Fertility Survey data claimed higher rural fertility than urban fertility in Latin American and Caribbean countries which was less pronounced in Asian and Pacific regions. Studies conducted by Sathar (1979), Alam and Shah (1986), Sathar and Casterline (1998) claimed lower fertility in urban than rural areas of Pakistan. Anyhow, despite the fact that most of the studies point to the higher average number of children born to couples residing

in rural areas compared to those residing in urban areas (Bhattacharya, 2006), there exist the divergent views and outcomes of the researches conducted on fertility in various parts of the world. Thus, the issue arises whether fertility truly differ by rural-urban place of residence and is it right that fertility in rural areas of less developed regions like Punjab is higher than that of urban areas? For the solution of this issue, it is seems valid to investigate fertility differences between rural and urban populations of Punjab. Study in point, using empirical data investigates these differences at district level and point out causes of these differences. In addition to this it also attempts to bring out fertility variations by residential background.

Methodology & Study Area

The study relies largely on two types of data. The main channels used for the collection of these data were population census and sample survey. Secondary data was acquired from 1998 provincial and district census reports of Punjab and primary data was collected with the help of questionnaire through field survey by interviewing targeted samples. For this purpose Bahawalpur was selected as a convenience sampling district where hardly any fertility study was under taken ever before. The foremost priority in this selection was that the district should be fairly representative of the entire province and should, therefore, have a reasonable balance of rural-urban representation. It was, thus, decided to collect data in proportionate to rural-urban distribution of population from the entire district (table 1).

Table 1: Population distribution in Bahawalpur

Tehsils	Population	% of district	Arithmetic Density	% rural	% urban	% of district's urban population
Bahawalpur	806,580	33.2	340.0	46.8	53.2	64.5
Ahmedpur East	718,297	29.5	420.0	83.7	16.3	17.6
Yazman	405,781	16.7	21.9	94.8	5.2	3.2
Hasilpur	317,513	13.0	231.4	77.5	22.5	10.7
Khairpur	184,914	7.6	208.2	85.5	14.5	4.0
Total (district)	2,433,091	100	98.0	72.7	27.3	100

Source: 1998 District census report of Bahawalpur.

The representative sample was taken from 7 urban and 13 rural clusters of Bahawalpur district (table 2). Size of sample for the survey was 15-49 years old reproductive age 1,000 currently married women. These samples were covered from the survey of 876 households (0.24% of the total households of the district) that contained a total population of 5995 individuals, 2994 males and 3001 females indicating sex ratio 99.97 males per 100 females (table 3). The sample size for the survey was determined from 384,423 married women of reproductive age by using 95% confidence level at a confidence interval of 3.1. This was done by using sample size calculator method of the survey software. The average household size of the surveyed population was thus 6.84. Fifty samples from each of the selected clusters were interviewed. For the selection of 20 clusters method of random sampling was employed. Using the list of rural clusters from 1998 district census report of Bahawalpur, 14 *Patwar circles* (PC) normally consisting

of 3 or 4 villages were randomly taken first and then one village from each selected PC was randomly picked for the study. Then 50 samples from each of the selected rural clusters were drawn randomly for interview by using electoral rolls for rural areas (Malik, 1997). For this purpose the qualified female population was numbered from 01 onwards and then random numbers were drawn by using computer sample command without replacement.

Table 2: Short depiction of sample (surveyed) areas

Code	Name of Cluster / Locality	Location Tehsil	Rural / Urban
1	Kalandar & Rehman Colony	Ahmadpur East	Urban
2	Model Town-A	Bahawalpur	Urban
3	Faisal Colony	Bahawalpur	Urban
4	Mohalla Darkhanan & Faridabad (Old City)	Bahawalpur	Urban
5	Himatian (Baghdad)	Bahawalpur	Urban
6	Islamia Colony	Bahawalpur	Urban
7	Ward No. 1,2,3 & 4	Yazman	Urban
8	Mubarakpur	Ahmadpur East	Rural
9	Nand Pura	Ahmadpur East	Rural
10	Qudir Abad	Ahmadpur East	Rural
11	Chak No. 32/BC	Bahawalpur	Rural
12	Chak No. 13/BC (A)	Bahawalpur	Rural
13	Chak No. 25/BC	Bahawalpur	Rural
14	Chak No. 79/Fathe	Hasilpur	Rural
15	Chak No. 186/Murad	Hasilpur	Rural
16	Karampur	Khairpur	Rural
17	Chak No. 45/DB	Yazman	Rural
18	Chak No. 75/ DNB	Yazman	Rural
19	Chak No. 40/DB	Yazman	Rural
20	Chak No. 106/DB	Yazman	Rural

For field survey, a questionnaire was developed that contained about 50 queries regarding various aspects of the study. To save cost and time and to maintain the cooperation and goodwill of the respondents the wording of questions was kept short and simple. To elicit more accurate answers, both closed and open ended questions were included. After editing and before starting the survey, the questionnaire was pre-tested in the field and result was closely examined. Some of the questions were modified in the light of pre-test of questionnaire in the field and after sufficient satisfaction it was finalized for data collection. However, some difficulties were faced in the field because respondents belonged to various backgrounds, castes, languages and educational levels.

To select urban sample clusters for survey, the headquarter settlements of all the tehsils of Bahawalpur district were included. Bahawalpur City consisting of Municipal Corporation and Cantonment area (Bahawalpur city consists of two parts, one is administered by Municipal Corporation called as corporation area and the other is administered by Cantonment Board called as cantonment area) contains 64.5% of the district's total urban population this is why five of the seven urban clusters were selected from Bahawalpur city. For the selection of remaining two urban clusters two of the four tehsil headquarters (Tehsil headquarters are the cities which administer the various aspects of the concerned areas) were again randomly drawn which were Yazman and Ahmadpur East. In order to conduct the survey, maps of the urban settlements were used. The starting points were located randomly by scaling orthogonal edges numbering from 0 onwards and by treating the edges as coordinates and using pairs of random numbers (Yeates, 1974).

Table 3: Brief description of surveyed population

Area	Total pop.	Children (0-4)	Live births (last 12 months)	Female live births (last 12 months	Total females (15-49)	Married females (15-49)	Total children ever born to married women of 15-49 years old
Rural	3865	593	128	59	941	650	2211
Urban	2130	288	48	21	552	350	1156
All	5995	881	176	80	1493	1000	3367

Area/Residence	Total pop.	%age	Males	Females)	Still alive children	Female live births (last 12 months
Rural	3865	64.5	1931	1934	1969	59
Urban	2130	35.5	1063	1067	1093	21
Total	5995	100	2994	3001	3062	80

Source: Field survey of Bahawalpur district conducted by the author for Ph. D. thesis.

Initially, fertility levels by districts as well as by rural-urban areas were computed from the data acquired through various primary and secondary sources. Though, fertility can be ascertained from the statistics of births, its direct measurement, however, is a troublesome subject. Contemporary fertility studies still place heavy stress on developing adequate tools of measurement. In search of adequate method to measure fertility, different yardsticks have been developed. But none of them alone is suitable for all purposes. A satisfactory picture of fertility levels can not be presented by using any single measure. Different measures of fertility are thus in use. Therefore, it becomes necessary to appreciate the merits and demerits of each method so that a realistic appraisal can be made of any figure quoted (Pollard et al, 1987: 80). Fertility is measured as the frequency of births in a population. Normally, a birth rate refers to the births over a specific period of time. There are thus two alternative approaches. One is to consider a short period of time usually one year and the other is to measure fertility over the complete period of reproductive life. The former approach is known as period measure and later is known as cohort measure. Following formulas have been used to measure fertility rate;

a) Crude Birth Rate

$$CBR = \frac{\text{Total live births in a year}}{\text{Total mid year population}} \times 1000$$

b) General Fertility Rate

$$GFR = \frac{\text{Total live births in a year}}{\text{Total females of age 15-49 years}} \times 1000$$

c) Child Woman Ratio

$$CWR = \frac{\text{Total No. of children aged 0-4 years}}{\text{Total female population of age 15-49 years}} \times 1000$$

d) Marital Fertility Rate

$$MFR = \frac{\text{Total live births in a year}}{\text{Total married females of age 15-49 years}} \times 1000$$

Age Specific Fertility Rate

$$ASFR = \frac{\text{Total live births in a year to women in specified age group}}{\text{Total No. of women in that specified age group}} \times 1000$$

e) Total Fertility Rate

$$TFR = \frac{\Sigma ASFRs}{1000} \times 5$$

f) Gross Re $GRR = \frac{TFR \times \text{Female live births in a year}}{\text{All live births in a year}}$

or GRR = ASFRs for female births × 5 / 1000; or GRR= TFR × 0.49 (this factor is arrived at by assuming that the sex ratio at birth is 105 males to 100 females. Thus the proportion of females in total number of births is 100 ÷ 205 = about 0.49.

g) Average number of children ever born

$$CEB = \frac{\text{Total live births to currently married women of age 15-49 years}}{\text{No. of currently married women of age 15-49 years}}$$

In these TFR and GRR are the group (cohort) measures whereas the all other measures work out period fertility (Weeks, 1986, p. 105). The cohort analysis considers the experience of one group of people over time usually all those born or marrying during a particular time interval. Whelpton (1954) initiated this method of fertility analysis in American fertility surveys. Contrary to this, period fertility considers the events occurring during a specific period of time. The selection of a measurement tool depends upon the nature of problem and the type of available data. Such as by using 1981 census data, only CWR can be calculated directly, but from 1998 census data, other fertility rates can also be calculated. Table 1 of the 1998 census reports provides data about the proportion of urban population. Table 4 gives the data for total population, total female population and female population of age 15-49 years, number of females in specific age group and total number of children age 0-4 years. Table 29 supplies data for the total number of children born alive and ever married women of age 15-49 years. Table 33 of the 1998 provincial and district census reports of Punjab contains data for total number of live births in a year, total female live births in a year, total ever married females of age 15-49 years, total number of live births during last 12 months to women in specified age group. For the calculation of correlation between degree of urbanization and fertility rate computer software SPSS-17 was used.

Rural-urban gap in fertility and its selected determinants

Sharing well above half of the country's total population, Punjab makes Pakistan world's sixth biggest country containing over 180.4 million people (World Population Data Sheet, 2012). Although, population of all the districts of Punjab is growing rapidly but growth rate of rural and urban areas is significantly variable because of variable rate of fertility in rural and urban areas. Rural-urban fertility gap is conspicuous in Punjab province and its districts that stems mainly from the differences in the level of socio-economic development in both the segments of same population, rural-urban migration, and distribution of births in rural and urban areas.

Table 4: Rural-urban gap in fertility, literacy rate and age at marriage by districts of the Punjab

Districts	% rural population	R-U gap in CWR	U-R gap in LR	U-R gap in MLR	U-R gap in FLR	U-R gap in MSMAM	U-R gap in FSMAM
Hafizabad	72.7	54.08	19.2	19.2	15.6	0.7	0.7
Khushab	74.7	18.24	14.9	14.9	8.2	0.2	0.3
Jhelum	72.3	64.13	18.7	18.7	10.5	-0.5	1.1
Bhakkar	84.0	61.06	25	20.0	21.4	1.0	0.9
Mianwali	79.2	113.30	18.3	18.3	12.6	1.6	1.4
Chakwal	87.8	25.46	16	16.0	7.4	0.3	0.8
Rajanpur	85.5	178.10	34.4	34.4	36.6	2.2	2.7
Layyah	87.1	186.66	27.5	27.5	22.7	2.4	2.2
M. Bahauddin	74.8	84.77	23.3	23.3	19.5	0.8	1.4
Lodhran	75.5	48.69	20.9	20.9	19.4	1.3	1.2
Narowal	87.8	109.88	17	17.0	11.2	1.1	1.4
Attock	78.7	50.26	25.8	25.8	18.1	0.4	0.8
Pakpattan	85.8	104.39	26.9	26.9	22.4	1.0	0.8
T. T. Singh	81.2	68.63	15.6	15.6	11.6	0.6	0.7
D. G. Khan	86.1	306.85	36.8	36.8	32.1	3.7	3.9
Sahiwal	85.6	108.43	26.4	26.4	19.5	1.0	0.9
Gujrat	72.3	68.29	14.9	14.9	9.1	-0.1	1.1
Bahawalnagar	80.9	50.66	22.1	22.1	19.4	0.8	0.6
Khenewal	82.4	76.20	25.3	25.2	22.8	-4.2	0.9
Vehari	84.0	70.58	23.8	23.8	20.0	1.1	1.3
Okara	77.0	85.96	27.4	27.4	25.1	0.3	0.9
Kasur	77.2	144.25	17.3	17.3	12.5	1.4	1.2
Bahawalpur	72.7	207.92	30.7	30.7	28.9	1.1	1.3
Muzaffargarh	87.1	185.52	31.4	31.4	27.9	2.8	2.7
Sargodha	71.9	85.51	25.1	25.1	18.6	1.2	1.5
Sialkot	73.9	152.29	18.5	18.5	14.0	1.0	1.2
Jhang	76.6	72.75	26.8	26.8	20.1	1.0	1.2
Multan	57.8	178.98	31.4	31.4	25.9	2.2	2.5
R. Y. Khan	80.4	132.12	30.1	30.1	27.0	1.5	1.8
Sheikhupura	73.8	80.72	18.8	18.8	15.0	0.7	0.8
Rawalpindi	46.8	42.94	12.1	12.1	2.3	0.0	1.6
Gujranwala	49.5	118.34	15.3	15.3	10.9	1.0	0.9
Faisalabad	57.3	81.78	21.7	21.7	16.0	0.2	0.7
Lahore	17.6	232.38	27.4	27.4	22.4	2.2	1.8
Punjab	68.7	133.48	8.8	8.8	20.5	1.4	1.4

Source: Provincial and district census reports of Punjab (1998).

Note: R-U= rural-urban, U-R= urban-rural, CWR= child-woman ratio, LR= literacy rate, MLR= male literacy rate, FLR= female literacy rate, MSMAM= male singulate mean age at marriage, FSMAM= female singulate mean age at marriage

In case of Punjab in general and of Bahawalpur district in particular, it has been observed that most of rural to urban migrants include those people who are either already at relatively better stage in socio-economic rung and cognizant of the healthier future of their children or they desire to move further upward in socio-economic ladder. Although their fertility rate is higher than urban inhabitants but their families are comparatively smaller than other rural inhabitants. They aspire to provide better education and other facilities to their children to improve their quality rather than increasing their number. On migration they are added to urban population leaving behind the high fertility conventional familial group in rural areas. Consequently the fertility of rural areas remains at higher level compared to their urban counterparts.

The degree of urbanization represented by the proportion of urban population can be one of the leading indicators of economic conditions and alleged to be a significant fertility differential in Punjab province and its districts. It is generally believed that the areas characterized with lower proportion of rural population reflect more development in terms of employment opportunities, income, standard of living, education, health facilities and so on. The proportion of rural population on the other side tends to decrease further as the process of economic development continues. As a consequence of economic development proportion of population engaged in secondary and tertiary economic activities rises reducing the proportion of rural population. Thus, higher the rate of economic development of an area, lower can be the proportion of its rural population and consequently lower can be the fertility rate. Although, rapidly growing cities may have fairly high rate of fertility in the beginning because the immigrants are mainly young adults who may preserve their rural demographic habits for some time, but overall fertility of urban dwellers remains lower than that of their rural counterparts. Moreover, rate of urban fertility can be inversely related to the size of urban area because with increasing size of city the population bearing urban characteristics acquires dominating position that favors to establish low fertility norms. This in turn affects national fertility which can be influenced by rural-urban fertility differential (Clarke, 1972). In case of Punjab, with a maximum of 87.8% in Chakwal and Narowal and a minimum of 17.6% in Lahore, the proportion of rural population highly varies from district to district. Consequently the rural-urban gap in literacy rate, age at marriage and fertility is also conspicuous (table 4).

This is reflected also in standard deviation of 14.56. With mean value 24.82 and median value 21.05, proportion of urban population shows significant inverse relationship with fertility measured in terms of child-woman ratio. Rural population and rural-urban fertility differentials show significant positive relationship to fertility (table 5).

Table 5: Univariate descriptives and Pearson's correlation coefficients

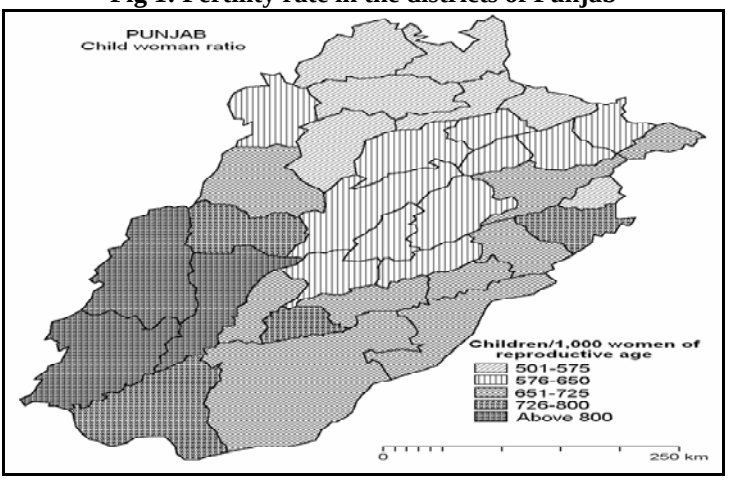
Fertility variables	Minimum	Maximum	Mean	Median	Std. deviation	Correlation coefficient
						Fertility (CWR)
Proportion of rural population	17.60	87.80	75.18	78.95	14.56	0.43*
Proportion of urban population	12.20	82.40	24.82	21.05	14.56	-0.43*
Rural-urban difference in fertility	18.2	306.9	107.4	85.1	64.5	0.59**

*Correlation is significant at the 0.05 level, **Correlation is significant at the 0.01 level.

It is believed that this variable (degree of urbanization) may also have indirect impact on fertility through other variables. It shows significant positive relationship to income, age at marriage, literacy rate and contraceptive prevalence rate (Khan, 2008). Table 6 displays its correlation with some of the other variables that may have impact on fertility. Furthermore, data indicates significant differences between rural and urban inhabitants in literacy rate and age at marriage (table 7). Compared to rural populations, urban residents usually have higher incomes, higher literacy rate and marry late usually after getting dependable employment. Their children have relatively more chances for better education and good employment, while on the other hand many of the rural children usually have fewer chances for quality education and good employment. Such situation may lead to enlarging gap in the level of socio-economic development between urban and rural areas resulting in lower fertility in urban populations than that of their counterparts.

Experiential results tell that fertility levels of the districts of same province as well as rural-urban areas of the same districts vary markedly. Fertility is higher in rural domains compared to urban areas in all the districts as well as in the whole province (tables 7 & 8) confirming inverse relationship between urbanization and fertility. It is evident from tables 4 and 7 that in some of the districts rate of fertility as well as rural-urban differences of fertility are considerably higher than the others. This may reasonably be attributed to the differences in their literacy rate, age at marriage and level of socio-economic development. Comparatively developed districts (i.e. northern and north eastern districts of Punjab) show relatively lower rate of fertility and vice versa (fig 1).

Fig 1: Fertility rate in the districts of Punjab



Data source: District census reports of Punjab (1998).

The urban social conditions of Punjab and its districts are more conducive than those in the rural areas for innovations like small family preferences and modern birth control practices. Lower urban fertility is mainly attributed to the high living standards and costs, social capillarity, high income, female employment, educational facilities and attainment, and low infant mortality rate. The differentials seem to be maintained above all by the higher direct, indirect and opportunity costs of raising and educating children in cities. Thus, residents of cities have less average number of children per couple, whereas people who live in rural areas have more children. As the urban residents are economically better off with incomes usually higher than rural residents, their children are raised in more favorable economic conditions than the children of rural inhabitants. Because of this, there are lesser chances for the children of urban residents to be spoiled, while many of the rural children usually lack necessary resources to be well fed and educated. The prevalence of such situation, if permitted, may lead to the enlarging gap in state of minds and thinking between the rural and urban residents. For these reasons, more emphasis of policy on rural areas may be suggestible. However, the gap found is not too wide in some of the relatively developed districts. This may be attributed to the fact that forces of modernization are increasing homogeneity in rural and urban areas in some of the districts of Punjab and their rural populations are becoming more urbanized in terms of attitudes and lifestyle. This fact leads to the conclusion that with increasing pace of socio-economic development these fertility differentials would narrow down further and eventually may disappear but it requires great effort and may take a long period of time. The examples of Sri Lanka and Bangladesh can also be followed in this regard where the fertility gap has been narrowed down by focusing on to rural areas. In Bangladesh rural areas were focused to control fertility and required targets were achieved. Consequently overall fertility rate has been decreased

considerably. Now the TFR of this country is 2.4 compared to that of Pakistan and Punjab where fertility rate (TFR) is 4.0 (Population Reference Bureau, 2012) and 4.7 (NIPS, 2001) respectively. Similarly Sri Lankan government has focused rural areas to enhance literacy rate of rural population. Resultantly their TFR is much lower (2.4) now than that of Pakistan and its province Punjab (Population Reference Bureau, 2012).

Table 6: Univariate descriptives and Pearson's correlation coefficients of degree of urbanization and other variables

Variables	Minimum	Maximum	Mean	Median	Std. Deviation	Correlation coefficient
						% age of urban population
Male singulate mean age at marriage	23.50	27.90	26.25	26.45	1.10	.38*
Female singulate mean age at marriage	19.30	23.50	22.08	22.35	1.19	.37*
Literacy ratio for both sexes	20.70	70.40	44.10	41.75	11.98	.58**
Male literacy ratio	29.20	81.20	56.27	54.15	11.63	.45**
Female literacy ratio	11.30	59.70	31.34	26.90	13.02	.67**
Education deprivation index	15.00	62.00	45.76	48.00	11.03	-.61**
Proportion of married population 15+ (both)	58.20	72.20	62.39	61.450	3.64	-.40*
Proportion of married male population 15+	55.50	67.80	59.16	58.50	3.21	-.42*
Proportion of married female population 15+	60.80	77.60	65.62	64.80	4.15	-.37*
Contraceptive prevalence rate	11.80	53.00	27.88	25.70	10.75	.67**
Proportion of employed labor force in agriculture	5.70	76.70	41.22	40.30	16.49	-.74**
Proportion of households having piped water	5.20	75.20	19.84	18.35	12.75	.84**
Proportion of households having electricity	40.40	96.00	68.75	69.20	16.30	.60**
Infant	40.00	95.00	73.56	74.00	13.35	-.44**

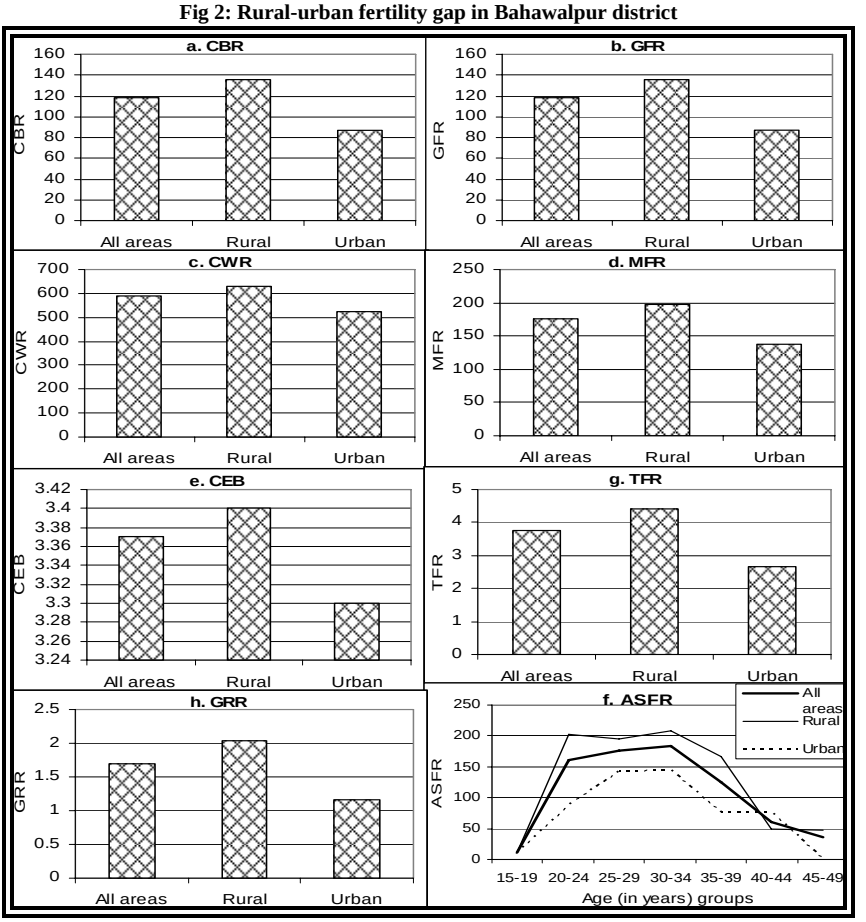
mortality rate						
Dependency ratio	73.00	110.00	89.12	87.40	8.55	-.59**

Data source: 1998 Provincial and district census reports of Punjab.

*Correlation is significant at the 0.05 level, **Correlation is significant at the 0.01 level.

The results derived from primary data also show the similar pattern of fertility differences signified by census data. All the fertility measuring instruments used to calculate fertility levels for rural and urban areas including CBR, GFR, CWR, MFR, CEB, ASFR, TFR and GRR demonstrate obvious differences in fertility between rural and urban areas (fig 2 & table 10).

Fig 2: Rural-urban fertility gap in Bahawalpur district



a. Crude birth rate (CBR), b. General fertility rate (GFR), c. Child woman ratio (CWR), d. Marital fertility rate (MFR), e. Average number of children ever born to married women of reproductive age, f. Age specific fertility rates (ASFRs), g. Total fertility rate (TFR), h. Gross reproduction rate (GRR).

Compared to urban areas, fertility is noticeably higher in rural areas. Fertility data relating to rural-urban differentials by different age groups also shows that the

fertility of women in every age group, except for 40-44 years, is higher in rural localities compared to their urban counterparts (table 9).

Table 7: Rural-urban distribution of literacy ratio, female singulate mean age at marriage (FSMAM) and Child-woman ratio (CWR)by districts of the Punjab

Districts	Literacy ratio			FSMAM			CWR		
	All areas	Urban areas	Rural areas	All areas	Urban areas	Rural areas	All areas	Urban areas	Rural areas
Hafizabad	40.7	54.7	35.5	22.4	22.9	22.2	643.8	658.9	604.9
Khushab	40.5	51.6	36.7	23.2	23.2	22.9	571.0	575.7	557.4
Jhelum	68.9	77.2	58.5	23.0	23.8	22.7	535.4	552.6	488.4
Bhakkar	34.2	55.1	30.1	22.3	23.0	22.1	677.1	687.1	626.0
Mianwali	42.8	57.1	38.8	22.4	23.5	22.1	638.3	662.4	549.1
Chakwal	56.7	70.7	54.7	23.3	23.3	22.5	506.1	509.3	483.8
Rajanpur	20.7	49.9	15.5	19.3	21.6	18.9	892.6	920.3	742.2
Layyah	38.7	62.4	34.9	19.5	23.7	21.5	736.5	762.6	576.0
M. Bahauddin	47.2	67.1	43.8	22.6	23.8	22.4	594.1	607.6	522.9
Lodhran	29.6	47.7	26.8	20.7	21.7	20.5	744.8	752.0	703.4
Narowal	52.7	67.5	50.5	22.5	23.7	22.3	684.5	698.6	588.7
Attock	49.3	69.4	43.6	22.3	22.9	22.1	530.4	540.9	490.6
Pakpattan	34.7	57.6	30.7	22.3	23.0	22.2	657.5	673.2	568.8
T. T. Singh	50.5	63.1	47.5	23.3	23.9	23.2	596.3	609.7	541.0
D. G. Khan	30.6	61.8	25.0	19.3	22.6	18.7	874.2	922.6	615.7
Sahiwal	43.9	65.8	39.4	23.3	24.1	23.2	602.2	615.7	507.3
Gujrat	62.2	72.8	57.9	22.8	23.6	22.5	562.6	581.4	513.1
Bahawalnagar	35.1	52.9	30.8	22.8	23.6	23.0	657.1	667.0	616.3
Khenewal	40.0	60.7	35.4	22.3	23.1	22.2	649.7	663.6	587.4
Vehari	36.8	56.7	32.9	22.2	23.1	21.8	657.5	669.2	598.7
Okara	37.8	58.7	31.3	22.1	22.8	21.9	663.9	683.8	597.9
Kasur	36.2	49.4	32.1	21.9	22.8	21.6	734.5	769.4	625.1
Bahawalpur	35.0	57.0	26.3	21.1	21.9	20.6	693.5	724.0	516.1
Muzaffargarh	28.4	55.5	24.1	19.5	21.9	19.2	839.0	864.5	678.9
Sargodha	46.3	64.2	39.1	22.5	23.5	22.0	597.9	622.7	537.2
Sialkot	58.9	72.3	53.8	22.9	23.7	22.5	618.8	660.5	508.2
Jhang	37.1	57.5	30.7	22.0	22.9	21.7	629.0	646.5	573.8
Multan	43.4	60.9	29.5	21.6	22.9	20.4	655.2	734.0	555.1
R. Y. Khan	33.1	57.0	26.9	20.9	22.3	20.5	770.0	797.4	665.3
Sheikhupura	43.8	57.6	38.8	22.2	22.8	22.0	685.9	707.9	627.2
Rawalpindi	70.4	76.0	63.9	23.5	23.8	22.2	501.0	523.8	480.8
Gujranwala	56.5	63.9	48.6	22.7	23.1	22.2	638.7	700.4	582.0
Faisalabad	52.0	64.2	42.5	23.0	23.4	22.7	597.4	633.5	551.7
Lahore	64.6	69.1	41.7	23.1	23.3	21.5	535.2	731.3	498.9
Punjab	46.6	46.7	37.9	22.5	23.2	21.8	639.4	683.0	549.5

Data source: 1998 provincial and district census reports of Punjab.

Numerous factors play their part to cause differences in fertility between rural and urban areas of Punjab, reflecting primarily the lesser impact of the forces of modernization on rural areas than that of their urban counterparts. Previous studies also indicate that literacy rate and age at marriage are the most significant determinants of fertility in the Punjab (Khan, 2010). A significant positive correlation exists between literacy rate and age at marriage and significant inverse relation between fertility rate and age at marriage and literacy rate (Khan, 2009 and 2008). Table 7 puts on view the brief story of the comparison of these indicators of fertility for all areas, rural areas and urban areas of the districts of the Punjab. In those districts where literacy rate is comparatively high, age at marriage is also high and consequently fertility rate is comparatively low. For low fertility districts, the data for literacy rate, age at marriage and child-woman ratio for Jhelum, Rawalpindi and Lahore districts can be viewed in tables 4 and 7. For high

fertility districts, data in these tables for literacy rate, age at marriage and child-woman ratio for Rajanpur, Layyah, DG Khan, Lodhran and Muzaffargarh districts can be viewed. It appears that disparity in reproductive behavior of the two-polar type community stems largely from differences in socio-economic conditions between the two poles. The rural communities of Punjab and specifically of the surveyed district are by and large characterized with a predominant agrarian economy, a higher degree of illiteracy, and early age marriages and childbearing. On the other hand, urban communities are economically more diversified, are more heterogeneous in composition and comparatively more literate. Thus, by virtue of their occupational diversification, there are usually many jobs requiring some degree of education. Such structural differences are inversely associated with attitudes encouraging to fertility and subsequently to fertility itself. Currently, the gap in the level of socio-economic development between rural and urban areas of the region is spacious. Under such circumstances, rural residents are more likely to maintain the traditional structure of family, whereby emphasis is placed on the utility of children as contributors to the family based enterprise. One would, therefore, expect that a region with a higher percentage of its population (specifically female population) living in rural areas may have higher fertility and vice versa.

Table 8: Fertility rate in all areas, rural areas & urban areas and rural-urban fertility gap in Punjab

Fertility measures	Age groups	All areas	Rural areas	Urban areas	Rural-urban gap
CBR	-	27.17	29.03	23.09	5.94
GFR	-	122.07	133.08	99.35	33.73
CWR*	-	715.01	718.28	706.66	11.62
CWR	-	639.44	683.02	549.54	133.48
MFR	-	178.48	188.63	155.41	33.22
ASFR	15-19	29.90	35.20	19.50	15.70
=	20-24	142.60	155.80	115.20	40.60
=	25-29	205.60	214.70	186.10	28.60
=	30-34	191.90	205.90	162.60	43.30
=	35-39	141.70	158.70	108.30	50.67
=	40-44	85.50	96.50	62.30	34.20
=	45-49	62.40	70.30	44.40	25.90
TFR	-	4.30	4.70	3.50	1.20
TFR* *	-	4.70	-	-	-
GRR	-	2.13	2.34	1.73	0.61

Source: 1998 Provincial census reports of Punjab, and Pakistan Population Data Sheet, 2001.

CBR = Crude birth rate, GFR = General fertility rate, CWR = Child woman ratio, MFR = Marital fertility rate, ASFR = Age specific fertility rate, TFR = Total fertility rate, GRR = Gross reproduction rate.

*CWR computed from 1981 PCR of the Punjab**TFR calculated by NIPS, 2001.

Furthermore, where the mode of production is familial and the flow of benefits (wealth) occurs from children to towards parents, fertility remains high. Conversely, where the mode of production is capitalist and flow of benefits occurs from parents to towards children, low fertility is economically rational (Namboodiri, 1980; Caldwell, 1976). In rural areas of Punjab where agrarian society dominates, children are considered earning hands for parents and flow of benefits occurs more from children to towards parents, high fertility is economically rational. Large families are believed to be assets and parents desire to have many children. This kind of attitude elevates fertility rate of rural areas.

On the contrary, in urban society of the region where industrialized and market oriented economy dominates, small families are considered advantageous. Role of children as earning hands and security for parents becomes less mainly due to trend towards mass education and better future. Thus flow of benefits is more from parents to towards children and large families appear to be a burden on parents. In such circumstances, small families economically become more desirable (Khan, 2010). Although, due to overcrowding, environmental pollution, and many other reasons urban areas are not necessarily healthier places to live than that of rural areas, urban inhabitants tend to have more facilities available to them and have better access to different types of relevant information. Increased awakening, affluence, better living, competition for progress and prosperity and spread of education are normal features of urban life of the region. These factors promote logical, materialistic and individualistic attitude among urban people which reflects in comparatively planned way of family life. The increasing parent's feeling of responsibilities and higher cost of living, education and bringing up children in urban areas compound this tendency. Social awakening among most of the rural inhabitants of the region is convincingly lesser. During field survey it was noted that some orthodox people, disregarding the responsibilities of parents, firmly believe that children are blessing of God and should not be denied by limiting the family size. After marriage most of the females are considered to reconcile the house and produce children. Since the chances of employment, education and enjoyment opportunities are limited; as a result, women live at home and feel satisfaction in producing and bringing up children. People are mostly contended with what they have. They believe that what God has given them is what was in their fate. Under the circumstances they don't care much for high living standard. They are also not mindful even if their living standard somewhat goes down and birth of more children does not worry them. The cost of bringing up children is low because in many families they are not well fed or educated. More children are thus not considered a burden. They rather feel that more children mean more earning hands and more old-age security. The couples in fact do not understand well and fully the social responsibilities that fall on them while increasing the size of family and go on adding to the number of children, thereby keeping fertility high. Besides, biological theories of fertility also make us believe that protein deficient diet in rural areas is another reasonable cause of higher fertility (Shrivastava, 1994). In contrast, orthodoxy in urban areas is losing its grip and couples do not feel much hesitation in controlling their family size. Most of the urban residents are quite conscious of the emotional needs and better future of their children. They understand that these needs can only be met when number of children is kept low. Thus, the increasing orientation of parents to the concerns and welfare of their children, families are increasingly becoming child oriented. With less children and more leisure, parents like to devote more time to the emotional needs of the children. All these factors are responsible to keep the fertility lower in urban population as against rural areas.

Table 9: Age specific fertility variations by rural-urban areas of Bahawalpur district

Age Groups	All areas			Rural areas			Urban areas		
	Total females (15-49)	Live births (last 12 months	ASFRs	Total females (15-49)	Live births (last 12 months)	ASFRs	Total females (15-49)	Live births (last 12 months)	ASFRs
15-19	280	03	010.70	180	02	011.11	100	01	010.00
20-24	286	46	160.83	182	37	203.29	104	09	086.53
25-29	277	49	176.89	179	35	195.53	98	14	142.85
30-34	262	48	183.20	158	33	208.86	104	15	144.23
35-39	144	18	125.00	78	13	166.66	66	05	075.75
40-44	133	08	060.15	80	04	050.00	53	04	075.47
45-49	111	04	036.04	84	04	047.61	27	00	000.00
Total	1493	176	752.80	941	128	883.06	552	48	534.83

Source: Field survey of Bahawalpur district conducted by the author for Ph. D. thesis.

Moreover, in urban areas, with growing influence of modernization and desire to rise in social rung, large family is seen with some contempt and disregard, and planned small family is becoming a status symbol. This in itself is a big check on fertility. However, to the extent that such differences exist in fertility attitudes between rural and urban areas, it may reasonably be expected that given time and further improvement in socio-economic conditions, differentials in actual fertility will emerge and, subsequently, acceleration in fertility transition will set in. It thus seems safe to say that if rural areas are provided with facilities available to urban areas they can contribute considerably to lower the fertility. Otherwise population of the region may keep on growing in unprecedented way further aggravating the socio-economic problems.

Fertility adaptation by rural-urban Migrants

This section exposes the existence of fertility adaptation effect of rural-to-urban migrants and their impact on urban fertility. It is commonly believed that migrants from rural-to-urban areas may have a significant impact on fertility. Rural-urban migration is a significant and worldwide phenomenon. Currently it is more significant in less developed regions specifically those experiencing accelerated urbanization like Punjab province of Pakistan. In the course of economic development it has experienced an unprecedented rate of urban growth as well as urbanization. Migration from rural to urban areas is a very prominent and frequent phenomenon in this region. No single theory can effusively elucidate the fertility of immigrants (Dubuc, 2012). According to intergenerational adaptation/assimilation hypothesis immigrants and their children are expected to adjust their fertility behaviour to the norms and prevailing environment in new area. Intergenerational fertility convergence reduces fertility differences between locals and immigrants and reproductive behaviour of second generation adapt to the local norms. According to sub-culture hypothesis, immigrants assume to the environment of the society in which they are living (Dubuc, 2012). A number of studies pointed out that fertility of immigrants converge to the fertility level of host area with the passage of time (Bach, 1981; Ford, 1990; Kahn, 1994; Sobotka,

2008 etc). In some other studies the main place of residence during childhood was found to be dominant in shaping the fertility of immigrants (Anderson, 2004). Available literature demonstrates that the components of both urbanization and industrialization, implied by the concept of modernization, are most often referred to explain the causes and consequences of migration, migration directions, and the demographic transition from high to low rates of fertility and mortality (Hoogvelt, 1981; 1990; World Bank, 1991; Todaro, 1994 etc). However, in Punjab under the influence of push and pull factors, each year a substantial number of people migrate from rural to urban areas and due to this factor proportion of urban population is incessantly on the rise in the province. Among the urban areas, Bahawalpur city has become one of the fastest growing cities of the Punjab. As regards fertility differences by residential background most of the samples (87.9%) included local residents but the influence of rural-urban migration factor was also found. The average number of births to migrant samples was 3.80 compared to 3.30 births to local woman pointing to a difference of 0.50 births per woman between locals and migrants. Marked differences were also found according to the period of migration. Average number of births was highest (5.30) among those whose immigration period was below 10 years, on an average 3.34 births were recorded among those who immigrated 10-19 years ago and lowest (3.11) among those who immigrated 20 or more years ago (table 10).

In the context of urban areas, this points to the dimension that fertility behavior of the women migrated from rural areas and are currently residing in urban areas is under the influence of their residential backgrounds (table 10). Most of the rural migrants to urban areas include young adults and they continue to observe high fertility rates as 'a carry over' from rural areas at least for few years (Bhende and Kanitkar, 1988: 267), and with the passage of time they gradually develop urban characteristics and their fertility level may fall. However, in case of rural areas of Punjab the proportion of migrants is low, so, their overall influence is diluted for the most part and does not count much specifically in case of fertility of the rural population. On the other side, rural to urban migrant may observe high fertility at least for some years and may elevate overall fertility level of urban population specifically when their number is high. Thus, in-migrants fertility adaptation effect reveals and data supports the existence of an adaptation effect.

Table 10: Fertility differences by rural-urban residence and residential background

Variables	CBR	CWR	GFR	MFR	CEB	TFR	GRR
1-Rurl-urban							
residence	33.11	630.18	136.02	196.92	**3.40**	**4.40**	2.03
Rural (N=650)	22.53	521.73	086.95	137.14	**3.30**	**2.67**	1.16
Urban (N=350)	29.35	590.08	117.88	176.00	**3.37**	**3.76**	1.70
All areas (N=1,000)							
2-Residential	20.24	378.10	074.62	123.96	**3.30**	**2.63**	0.88
background	30.64	623.06	124.61	183.16	**3.81**	**3.90**	1.81
Local (N=879)	20.21	520.50	85.21	111.11	**3.28**	**3.31**	0.82
Migrant (N=121)	27.38	633.46	107.56	138.88	**4.90**	**4.91**	1.90
Urban local (N= 249)	20.05	585.36	85.36	112.90	**5.30**	**3.50**	0.72
Rural to urban migrant	17.16	152.77	55.55	125.00	**3.34**	**2.54**	*
(N=101)	25.15	361.70	85.10	148.14	**3.11**	**2.29**	1.71
Duration of migration							
Below 10 years (N=62)							
10-19 (N=32)							
20 & above (N=27)							

Source: Field survey of Bahawalpur district conducted by the author for Ph. D. thesis.

*Data is either too small or don't justify the requirement of calculation method.

In view of the facts revealed, some policy implications can also come out from the study especially with regard to high fertility levels in certain districts and specifically in rural areas where almost two-third of the population of Punjab still inhabits. In spite of nearly half a century of official government efforts and policies designed to limit birth rate, high fertility remained deep-rooted in Punjab specifically in the districts that contain higher proportion of rural population and are socio-economically less developed like Bahawalpur. Both the stratums (rural and urban) of population are associated with different mindsets about education, income, marriages and family size options, which influence fertility and cause striking differences in fertility among these groups. Currently the focal point of Pakistan's anti-natalist population policy is to reduce the fertility rate down to replacement level by the end of the second decade of prevailing century. To achieve this target, the main focus of policy is on the provision of family planning methods. Policy makers emphasize that at least those women who want to avoid pregnancy should have access to the means of doing so. The study also corroborates that in existing situation it is beneficial for Punjab to reduce fertility rate. However, it urges that the main focus should be the rural areas. Policy makers must be aware of ground realities and policies should be formulated with the intension that they go with the requirements of the people and help them in overcoming shortfalls in providing services regarding fertility control.

Conclusion

In this study fertility differences between rural and urban sections of the same population have been investigated. The impact of rural-urban place of habitation on the fertility has been examined. The major findings are based on the comparison of fertility levels of rural and urban residents. Disagreeing with the previously held notion that there are little or no differences in fertility level

between rural and urban populations, the study concludes that rural-urban residence is a significant differential of fertility. The empirical results provide convincing answer of the question that fertility rate may differ noticeably by rural-urban place of residence in developing and less developed areas. This is explicitly valid in case of Punjab and its district Bahawalpur. Fertility rate is outstandingly higher in rural areas than that of their urban counterparts and there is a clear-cut inverse relationship between degree of urbanization and fertility in Punjab. The main reason of the higher fertility in rural than urban areas is the difference in their level of economic development and socio-economic conditions of the people. Less economic development and poor socio-economic conditions are the main cause of higher fertility in rural areas of the Punjab. The study also concludes that fertility behavior of the women migrated from rural areas and are currently living in urban areas is under the influence of their residential backgrounds. Data supports the existence of fertility adaptation effect in migrants from rural areas. Most of the rural migrants to urban areas include young adults and they continue to observe high fertility rates as 'a carry over' from rural areas at least for some years, and with the passage of time they gradually develop urban characteristics and their fertility level might go down. The study thus urges, particularly for those working on to control fertility in Punjab that they need to focus more on to rural areas if they actually want to restrict fertility. In this way speed of population growth can be reduced in the region.

References

Alam, I. and Nasra M. S. (1986). Population Composition, Mortality and Fertility, in Nasra M. Shah (ed.)
Pakistani Women: *A Socioeconomic and Demographic Profile*. Islamabad: PIDE. pp. 53-86.
Anderson, G. (2004). Childbearing after Migration: Fertility patterns of foreign-born women in Sweden.
International Migration Review, (38)2, pp. 747-775.
Bach, R. L. (1981). Migration and Fertility in Malaysia: A tale of two hypotheses. *International Migration*
Review, (15)3, pp. 502-521.
Bhattacharya, P. C. (2006). Economic Development, Gender Inequality and Demographic Outcomes: Evidence
from India. *Population and Development Review.* (32)2, pp. 263-292.
Bhende, A. A., and Kanitkar T. (1988). *Principles of Population Studies* (4th edition). Bombay: Himalaya
Publishing House.
Caldwell, J. C. (1976). Towards a Restatement of Demographic Transition Theory. *Population and*
Development Review. (2)3 & 4, pp. 321-66.
Clarke, J. I. (1972). *Population Geography* (2nd edition). Oxford: Pergamon Press.
Dubuc, S. (2012). Immigration to the UK from High Fertility Countries: Intergenerational Adaptation and
Fertility Convergence. *Population and Development Review.* (38)2, pp. 353-368.
Ford, K. (1990). Duration of Residence in the United States and the Fertility of US Immigrants. *International*

Migration Review, (24)1, pp. 34-68.
Freedman, R. I. et al. (1972). Trends in Family size Preferences and Practice of Family Planning Taiwan 1965-
70. *Studies in Family Planning*. (12)3, pp. 281-296.
Goldstein, S. (1973). Interrelationships between Migration and Fertility in Thailand. *Demography*. (10)2, pp.
225-241.
Hakim, M, A. (2000). Fertility Transition and Differentials in Pakistan, in *Pakistan's Population Issues in the*
21st Century. Conference Proceedings, 24-26 October Karachi. Islamabad: Population Association of Pakistan, pp. 611-633.
Hashmi, S. S. (1965). *The People of Karachi*: Demographic Characteristics. Karachi: PIDE.
Hoogvelt, A. M. M. (1981). *The Sociology of Developing Societies* (2nd edition). London: Macmillan Press.
Kahn, J. R. (1994). Immigrant and Native Fertility During the 1908s: Adaptation and expectations for the future.
International Migration Review, (28)3, pp. 501-519.
Karrim, M. S. (1974). Fertility Differentials by Family Type. *The Pakistan Development Review* (13)2, pp. 129-
144.
Khan, A. A. (2010). *Fertility Pattern in Punjab*: Measures, Determinants and Differentials. Germany: VDM.
Khan, A. A. (2010). Fertility Differentials by Rural-Urban Residence in Developing Areas: A Case of
Bahawalpur District. *Journal of Social Sciences & Humanities*. Islamabad: AIOU. (18)2, pp. 27-52.
Khan, A. A. (2009). Is fertility in less developed rapidly growing regions really influenced by literacy rate and
age at marriage? A case of Punjab, Pakistan. *Journal of South Asian Studies.* (24)1, pp. 121-146.
Khan, A. A. (2008). Spatial Analysis of Fertility Pattern in the Punjab. *Ph. D. Thesis.* Department of Geography,
The Islamia University of Bahawalpur.
Kuznets, S. (1974). Rural-Urban Differences in Fertility: An International Comparison. *Proceedings of the*
American Philosophical Society 118, pp. 1-19.
Malik, M. A. (1997). A Study of Human Fertility Behaviour in Relation to Education and Some other Socio-
economic Variables. *Scientific Sindh.* Shah Abdul Latif University Khairpur. (4), pp. 49-56.
Mosk, C. (1980). Rural-Urban Fertility Differences and the Fertility Transition, *JSTOR: Population Studies*.
(34)1, pp. 77-90.
Namboodiri, N. K. (1980). A Look at Fertility Model Building from Different Perspective, in Burch, T. K.,
Demographic Behavior: Interdisciplinary Perspectives on Decision-making. Colorado: West View Press Inc. pp. 71-90.
NIPS. (2001). *Pakistan Population Data Sheet*, Islamabad.
Omran, A. R. (1973). *Egypt*: Population Problems and Prospects. University of North Carolina: Population
Centre.
Population Census Organization. (2001). *1998 Provincial Census Report of Punjab.* Islamabad.
Population Census Organization. (1999). *1998 District Census Report of Bahawalpur*. Islamabad.
Population Census Organization. (1998). *District Census Reports of Punjab*. Islamabad.

Pollard, A. H. et al. (1987). *Demographic Techniques*. (2nd edition). New York: Pergamon Press.
Population Reference Bureau. (2012). *World Population Data Sheet*. New York.
Robinson, W. C. (1967). Differential Fertility in Pakistan, in W. C. Robinson (ed.). *Studies in the Demography*
of Pakistan. Karachi: PIDE. pp. 99-130.
Rodriguez, G. and Cleland J. (1981). Socio-economic Determinants of Marital Fertility in Twenty Countries: A
Multivariate Analysis. *World Fertility Survey Conference 1980 held in London:* Record of Proceedings. Netherlands: International Statistical Institute Voorburg. (2), pp. 337-434.
Sample Size Calculator. (2012). Available at: http://www.surveysystem.com/sscalc.htm. Retrieved on 03-01-
2012
Sathar, Z. A. (1979). Rural Urban Fertility Differentials in Pakistan: 1975, *The Pakistan Development Review*.
(16)4.
Sathar, Z. A. and Casterline J. B. (1998). The Onset of Fertility Transition in Pakistan. *Population and*
Development Review. (24)4, pp. 773-796.
Shrivastava, O. S. (1994). *Demography and Population Studies* (2nd edition). New Delhi: Vikas Publishing
House Pvt Ltd..
Sobotka, T. (2008). The Rising Importance of Migrants for Childbearing in Europe. *Demographic Research*,
(19)9, pp. 225-248.
Todaro, M. (1994). Urbanization and Rural-Urban Migration: Theory and Policy. in M. Todaro. *Economic*
Development. (5th edition). New York: Longman.
UN. (1973). The Determinants and Consequences of Population Trends, New Summery of Findings on
Interaction of Demographic, Economic and Social Factors. *Population Studies.* New York: Department of Economic and Social Affairs. (50)1.
UN. (1953). *The Determinants and Consequences of Population Trends*. New York.
University of Indonesia. (1974). *Indonesian Fertility-Mortality Survey 1973: Preliminary Report*. Jakarta.
Weeks, J. R. (1986). *Population: An Introduction to Concepts and Issues*. (3rd edition). California: Wadsworth
Publishing Company.
Whelpton, P. K. (1954). *Cohort Fertility: Native White Women in the United States.* Princeton University Press.
World Bank. (1991). *Urban Policy and Economic Development: A World Bank Policy Paper*. Washington, D.C.
Yeates, M. (1974). *An Introduction to Quantitative Analysis in Human Geography.* New York: McGraw Hill
Inc.
Yusaf, F. and Retherford R. P. (1981). Urban-Rural Fertility Differentials in Pakistan, *Journal of Biosocial*
Sciences. (13)4, pp. 491-99.

Biographical Note

Dr. Asad Ali Khan is working at Department of Geography, The Islamia University of Bahawalpur, Bahawalpur-Pakistan