



## Empirical Investigation of Multi-dimensional Gender Inequality in Pakistan: a Case Study of Punjab

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### Abstract

Developing nations, having economies in juvenile stage, are facing internal problems along with challenging issues on international level. Gender inequality is one of the critical subjects among those many problems. It refers to hidden disparity among individuals. A quite common phenomenon faced all around the globe, Pakistan is facing this problem in all aspects of life. It include but not limited to inequalities in paying rewards to labors, overall working conditions of labor market and provision of necessities (food, education and health). These all issues emerge due to unequal resource distribution during the phase of policy fabrication. Current study was designed to examine the gender status in Punjab province of Pakistan covering aspects like education, labor force participation and health sector. Secondary data was collected from Punjab Statistics Development, Federal Bureau of Statistics and other private and public organizations. Literacy rate was taken as output variable whereas, input variables included; infant mortality male-female ratio, male-female school enrolment ratio and male-female labor force participation ratio. Co-integration was exercised to conduct analysis. Results showed that there is gender biasness in literacy rate, labor force participation rate and enrollment ratio. Gender biasness is more in rural areas than urban areas. In addition to this, there is a positive relationship between literacy rate, primary school teachers, primary enrollment and labor force participation rate whereas a negative relationship exist between literacy rate and infant mortality rate.

## Introduction

### Gender Disparity

Gender inequality refers to disparity among male and female in terms of distribution of available resources. However this is not the limitation. This term is also use to highlight social constructed role of men and women according to their attitude and their responsibilities (Sharif and Rahman, 2009). This inequality arises from our societies, cultural values, families, their rights and resources. It is a worldwide phenomenon ---- faced by all regions without distinction of developed and under

developing world (Khadija, 2007). During the last two decades, this phenomenon has gain wider attention due to mandate of United Nation including Beijing Platform for Action. It is one of the worst realities that even now; there are no country which has taken action to remove this inequality in spite of having greater awareness about gender related issues (Augusto and Saadia, 2005).

South Asia Region is experiencing slow demographic changes however; it is known for high-pitched inequalities regarding power and autonomy of male and female. A number of researchers theorized that elevated level of

gender disparities and female's autonomy is highly correlated with communal and demographic conduct among the countries in South Asia Region (Morgan and Niraula, 1995 and Dyson and Moore, 1983).

### **Women and Health**

Pakistan is a poor country in terms of health indicators. Inhabitants have lower life expectation rate at the time of birth as compare to an average that is recognize for South Asian countries. According to Human Development Report presented by UNDP highlights that female life expectancy in Pakistan is about 60.7 against 61.0 years for males (S. Shafqat, Gender aware policy appraisal health sector, prepared for GRB Project, 2006). Furthermore, low health status of women results from women's lower social, cultural and economic status. Familial control over women's sexuality, limitations on mobility and economic dependence on their males are determining factors of access to health services.

In addition to this, Intra household prejudice in food sharing results in nutritional deficits among female infants and children. This can lead to future health complications. Early marriages of girls, unnecessary or excessive child bearing and high level of illiteracy are affecting women's health badly. Longstanding and traditional gender biasness inside health service delivery systems like absence of female facility providers and overlooking women's basic and reproductive health requirements are some of the intensifying factors that women are facing already (Asian Development Bank, 2000).

### **Importance of Education**

Development in any nation is based on education which has significant and vital importance. One of the basic rights of a female human is to get access to quality education, job and empowerment. Studies have revealed that as the education level of a woman increases, there is always an increase in their wage plus return to education is commonly greater than that of men.

So for this, current time demands a need of development (Schultz, 2002). Positive impact is obtained when a female of nation is educated. Per capita of income of country increases as the ratio of educated women increases (Stephan, 2002). There is a strong gender inequality in education attainment and literacy in rural and urban area and between the provinces. The literacy rate in urban areas has been recorded around 58.3 percent. In rural area this figure is around 28.3 percent and top of it, only 12 percent rural women are literate. Substantial disparities exist among the four provinces in literacy rate, especially disparities among male and female (Saeeda, 2007).

The province of Punjab is one of the most developed provinces in Pakistan. It is far ahead in terms of agricultural production, sanitation, road structure, communications and availability of basic facilities. While in case of rural areas, they portray the same picture that is available for rest of the country. They are homogeneous regarding communications, level of education, publicity to media, income and women's status in society. Net Enrolment Rate (NER) is just 7 percent regarding females at secondary level in rural areas of Punjab. However if this value is compared with values of major cities and urban areas, the result is 24 percent and 17 percent respectively (PBS, 2005).

### **Participation of Women in Labor Force**

Women in South Asia are less likely to participate in labor force as compared to their counterpart across the world. Therefore, participation of women in labor market is low in status and also in income. Another dilemma in this regard is that labor force participation rate of women is not reported accurately by official sources. Similarly, refined activity rate for men is higher than women. According to a survey, this rate is 13.6 percent for women against 70 percent of men. This highlights a high level of gender disparity. In case of crude activity rate, the value is 9 percent for women where for men it is 47 percent (Asian Development Bank, 2000). There is no doubt an increase that is observed in the gender gap regarding all sectors of Pakistan and it ranks 134th in gender gap ranking (World Economic Forum, 2012) against 120th position for the same indicator in 1998 (UNDP, 1998). This situation convincingly highlights that the situation has worsen in the current decade.

Keeping in view all these issues, the current study is intended to evaluate the gender inequality in health, education and labor force participations in the Punjab Province. It will help in understanding the relationship between literacy rate, enrolment ratio, labor force participation and infant mortality rate.

### **Materials and Methods**

To evaluate the gender inequality in Punjab and to check the relationship between literacy ratio, enrollment ratio, labor force participation and infant mortality rate, the secondary data was used for these variables. Sources of secondary data were Federal Bureau of Statistics (FBS), Labor Force Survey, Punjab Development Statistics, and Gender Statistics.

In order to test the hypothesis that is; to evaluate the relationship between literacy rate, infant mortality,

enrollment ratio and labor force participation rate. The following model was exercised;

$$LITR = \beta_0 + \beta_1 IMFR + \beta_2 MFER + \beta_3 MFLFP + \mu$$

Where;

LITR is Literacy rate

IMFR is Infant Mortality male-female ratio

MFER is Male-female enrolment ratio

MFLFP is Male-female labor force participation ratio

$\beta_0$ ,  $\beta_1$ ,  $\beta_2$  and  $\beta_3$  are regression coefficients and  $\mu$  is a random error or disturbance term.

In time series case, Augmented Dickey Fuller (ADF) test is operated. The test tells us whether data is stationary or not? Stationary condition in time series occurs when its mean variance and auto covariance remain the same. A stationary time series is one that does not deviate over time. On the other hand, non-stationary series shows some sort of upward trend (Dickey, 1984). In case of a pure stationary or a strongly stationary process, all higher order moments are constant with variance and mean. Similarly a weakly stationary process has a constant mean (Challis and Kitny, 1991).

Furthermore, in order to estimate order of integration for time series, unit root test is operated on all included variables. Results shows acceptance of unit root hypothesis, i.e., time series became stationary at first difference. More negative values tell that there is unit root at some level of confidence. Table 1 in 'Results and Discussion' section highlights result of ADF unit root test

### Co-integration Analysis

The variables can be co-integrated if a long run or equilibrium relationship exists among them. If there is a relationship among 2 non-stationary series and X, like residuals of regression which are stationary then the variables are said to be co-integrated.

Co-integration analysis was utilized to find long run relationship between literacy rate, infant mortality rate, enrollment ratio and labor force participation rate. Engle Granger test is a remedy to spurious regression. Spurious regression is a problem in regression analysis when time series have high R<sup>2</sup>, yet displays high auto-correlated residuals indicated by low Durbin-Watson statistics (Phillips, 1986). OLS estimation was applied on this model with intercept term.

For first objective, to evaluate the gender inequality in Punjab, graphical approach was used for explaining this objective. In order to analyze relationship between literacy rates, infant mortality, enrollment ratio labor force participation rate and also the primary teacher's ratio, Co-integration regression was used. For determination of the

data, ADF unit root test is operated. Engle Granger co-integration analysis, suggest that long run relationship exists among variables. Error Correction Mechanism is then used to affect the variables in the short run.

## Results and Discussion

### A. Graphical Approach

#### Literacy Rate

During period 1990 to 2010, significant improvement took place in literacy rate across the gender throughout Punjab. Overall literacy rate of population shows an upward trend, while male literacy rate was increased from 51.14 percent in 1989-90 to 69.1 percent in 2009-10. Overall female literacy rate was only 25.89 percent in 1989-90, which turned to 49.1 percent during 2009-10. Data show that reforms made for female education works fine and it had significantly improved the literacy rate of females. The reason for this increase could be more primary schools for female which were installed as compared to males but still there is a need to enhance female literacy rate to bring them equal to male in order to eliminate gender inequality. It is now up to policy makers to devise a strategy that should help in eliminating this biasness. Some other facilities were also given to female students like free books and low fees as compare to male students. It will provide a boost and positive effect to increase female literacy rate in coming future.

#### Literacy Rate: Rural vs. Urban

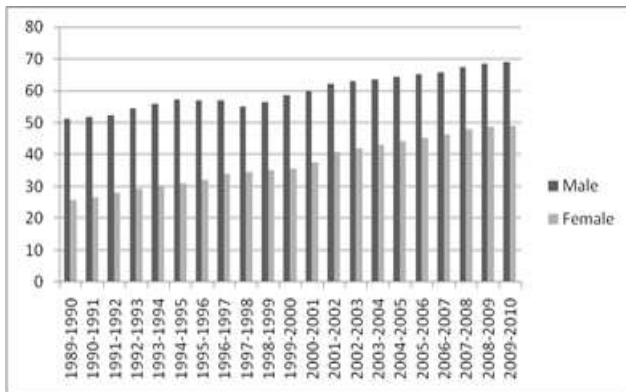
Over the period 1990 to 2010, a significant improvement took place in overall literacy rate across gender in rural and urban areas of Punjab. During 1989-90, male literacy rate was around 45 percent in rural areas of Punjab which increased to 64 percent during 2009-10. Literacy rate improved more in rural areas as compared to urban areas which were about 68 percent during 1989-90 and it became 79 percent in 2009-10. On the other hand, a boost in female literacy rate was observed in rural areas of Punjab. Female literacy rate boosted to 41 percent in 2009-10 which was below 18 percent in 1989-90. While in urban areas, female literacy rate improved significantly and it became 68 percent in 2009-10 which was 48 percent in 1989-90.

It is necessary to open more girls' school in rural areas so to increase the literacy rate of Punjab. The need of the time is that government should give more attention towards female education in rural areas of Punjab. About 70 percent of Punjab population belongs to rural areas. It means 70 percent of females reside in rural areas, which is a huge proportion. Government should reorganize its

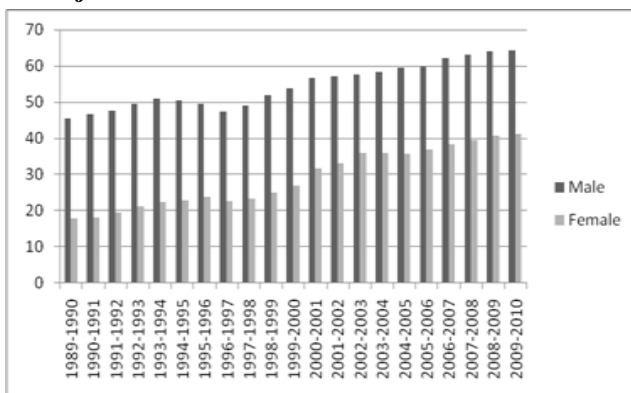
educational policy.

**Male-Female Literacy Rate**

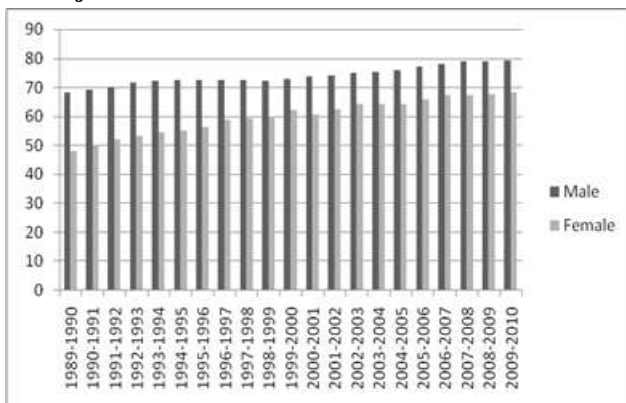
**Graph 1: Male and female literacy rate of Punjab from 1989-90 to 2009-10**



**Graph 2: Male and female literacy rate in rural areas of Punjab from 1989-90 to 2010**



**Graph 3: Male and female literacy rate in urban areas of Punjab from 1989-90 to 2009-10**



**Labor Force:**

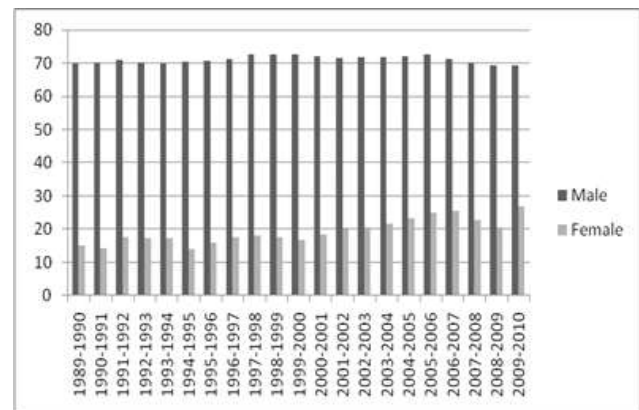
Over the period 1990 to 2010, a very little improvement took place in labor force rate across the genders

throughout Punjab. Overall labor force rate of population shows more or less constant trend. Overall, male labor force rate was around 70 percent throughout the period under study that is 1989-90 to 2009-10. It shows that some improvement during the time period 1997 to 2006 was observed but labor force rate eventually went down. While female labor force rate has some positive attitude. It increased from 15.1 percent in 1989-90 to about 26.9 percent in 2009-10, which is indicating that females have started participating in work force. It also indicates opportunities for female to work. Announcement of reserved seats for females in all government services significantly affect female labor force rate. Serious steps are required for the new government in Pakistan that has been constituted in May 2013 to boost education level in the country.

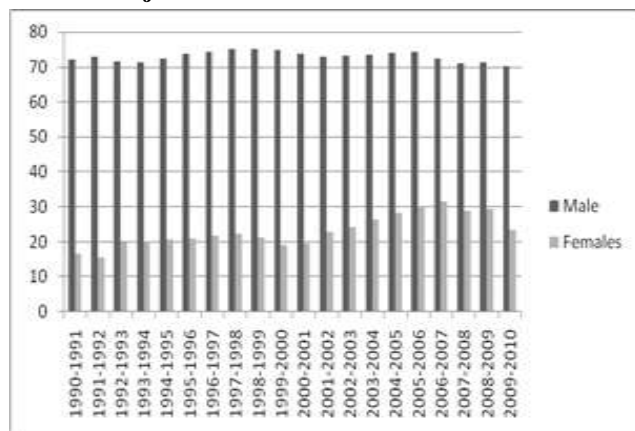
**Labor Force Rural vs. Urban**

During the period 1990 to 2010, no significant improvement took place in overall labor force across the gender in rural and urban areas of Punjab. No major improvements were observed in male labor force from 1989-90 to 2009-10. It showed some improvements during 1996-2006, but after that it again started decline. Same trend is observed in urban areas of Punjab for male labor force figure. Data shows that there is no significant improvement made during the period under study. When it comes to female of rural area, some improvements are observed during the years 2002-2007. While in urban areas, the trend remains the same. A rapid improvement is observed during the last two years. Government should make some policies that can increase female labor force participation rate to a higher level.

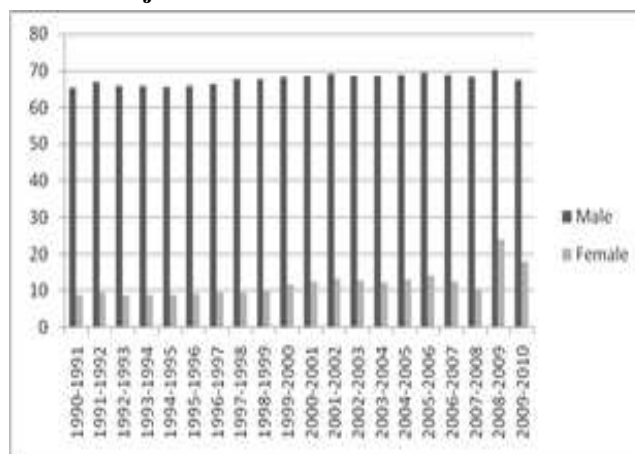
**Graph 4: Male and female labor force rate of Punjab from 1989-90 to 2009-10**



**Graph 5: Male and female labor force rate in rural areas of Punjab from 1989-90 to 2009-10.**



**Graph 6: Male and female labor force rate in urban areas of Punjab from 1989-90 to 2009-10.**



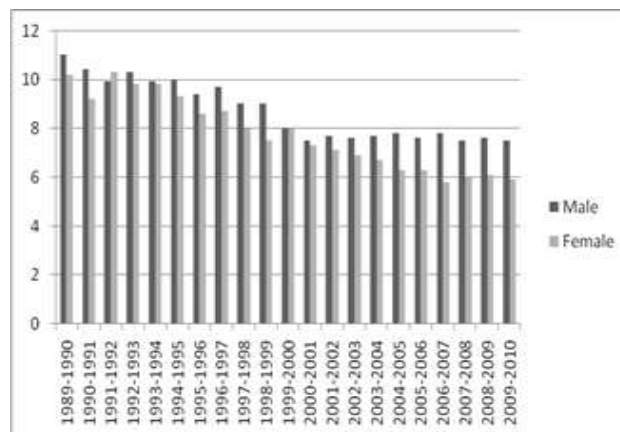
**Crude death rate:**

During the period 1990 to 2010, significant improvement took place in health sector across the rural and urban areas of Punjab. Many schemes were initiated to improve the health of mother and child like lady health workers and availability of medicines in the government hospitals. These efforts have significantly reduced the infant mortality rate as well as crude death rate of males and females in Punjab. Crude death rate of males was 11 percent in 1989-90 and it reduced to 7.5 percent in 2009-10. Also crude death rate of female was 10.2 percent and now it is about 5.9 percent in 2009-10.

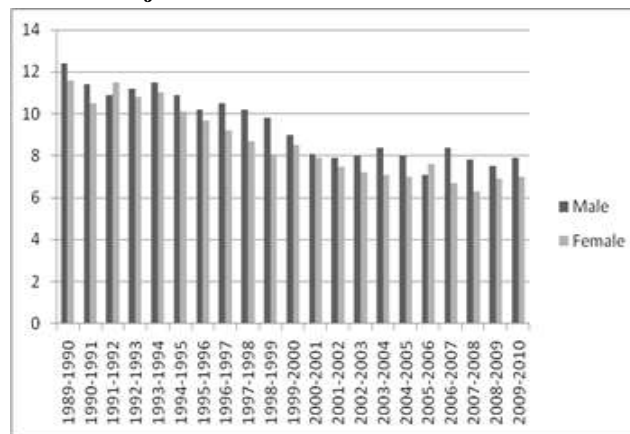
When compare, crude death rate of male in rural and urban area shows that male death rate is lesser in urban area than rural areas. This could be due to lack of health facilities in rural areas. Crude death rate of male in urban areas is reduced to 6.6 percent in 2009-10 while in rural areas it reduced to 7.9 percent in 2009-10. In case of female, same pattern is observed. Crude death rate of

female in urban areas is reduced to 4.8 percent in 2009-10 while in rural areas it reduced to 7 percent in 2009-10.

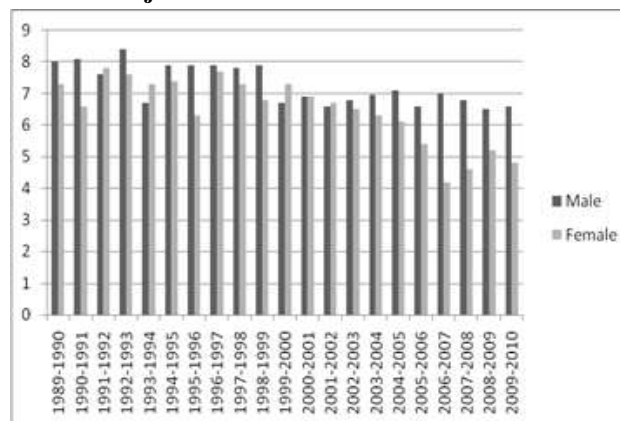
**Graph 7: Male and female crude death rate in Punjab from 1989-90 to 2009-10**



**Graph 8: Male and female crude death rate in rural areas of Punjab from 1989-90 to 2009-10**



**Graph 9: Male and female crude death rate in urban areas of Punjab from 1989-90 to 2009-10**



**B. Empirical Approach**

Table 2 shows the results of simple OLS estimation technique. The following estimated OLS equation is:

$$\text{Literacy rate} = 0.010 + 0.508312\text{primenroll} + 0.0877766\text{laborforce} + 0.003288\text{infantmort} + 0.56\text{primteach}$$

After estimating, the equation residuals were saved. This is the error-correction term. In order to find whether error-term is stationary or not, ADF test was used. Table-3 demonstrations results of ADF test applied on the residuals. The P value shows residuals were stationary at levels which means there exists a long term affiliation among the variables.

Long run equation is called the static or long-run function. Thus, values of the coefficients, which are; male-female primary enrollment, male and female labor force participation and male-female primary teacher shows positive and significant relationship between the literacy rate. It means that if there is one unit increase in male-female enrollment ratio, then male-female literacy ratio will increase by 0.5 percent. Similarly one unit increase in male and female labor force participation rate will increase male-female literacy rate by 0.08 percent and if one unit increase in primary teachers occur, literacy rate will increase on average by 0.5. However, the coefficient of infant mortality rate is non-significant, indicating that infant mortality rate fails to affect gender inequality in literacy rate. The R2 shows variation in dependent variable due to independent variables. In this study the R2 shows that there is 0.94 percent variances comes in literacy rate due to labor force participation rate, primary enrollment and primary teachers.

**Table 1: Augmented Dickey Fuller Unit Root Test**

Variables	DF/ADF value	P value level of significance	Lag (included)
Literacy rate	-5.206072	0.031	1
Labor force	-5.491857	0.0018	1
Infant mortality	-4.694629	0.0073	1
Primary enrollment	-4.734196	0.0074	1
Primary teacher	-4.694629	0.0039	1

**Table 2: OLS Estimation taking male-female literacy rate dependent variable**

Variables	Co-efficient	t-values	Std. Error	P values
C	-0.10154	-0.441002	0.230264	0.6651
Labor force	0.0877	2.871743	0.030562	0.0111
Infant mortality	0.003288	0.036748	0.089469	0.9711
Primary enrollment	0.508312	2.463170	0.206365	0.0255
Primary teacher	0.564566	3.922456	0.143930	0.0012

<b>R-Squared</b>	0.94
<b>Adjusted R-square</b>	0.93
<b>Durban Watson</b>	1.31

**Table 3: Residual ADF test Results**

<b>ADF test statistics</b>	-3.608103
<b>1percent critical value</b>	-2.685718
<b>At 5 % critical value</b>	-1.959071
<b>At 10 % critical value</b>	-1.607456

**Error Correction Mechanism (ECM)**

Constructing an Error Correction Mechanism or model is the second step in Engle Granger Co-integration. An error correction model tells short run relationship among the variables. In this study, error correction mechanism tells that no short run relationship exists between literacy rate, infant mortality rate and primary enrolment. But there is a significant relationship between the literacy rate, labor force participation rate and number of primary teacher. The economic philosophy supports a process of labor force absorption in different sector including education, most specifically employment of primary school teachers in the province of Punjab, Pakistan. Institutional policies and education led program of government and non-

government bodies confirms these results. Table 4 demonstrations result of Error correction mechanism.

**Table 4 Result of Error Correction Mechanism after taking the first differences**

Variables	Coff.	Std.Error	t-Statistic	Prob.
C	0.058790	0.064047	0.917928	0.3732
DINFANTMORT	0.008961	0.043744	0.204854	0.8404
DLLLL	0.048663	0.015765	3.086853	0.0075
DPRIMTEACH	0.278069	0.090054	3.087790	0.0075
DPRIMENROLL	0.057312	0.046405	1.235043	0.2358

<b>R<sup>2</sup></b>	0.55
<b>Adjusted R<sup>2</sup></b>	0.43
<b>Durbin</b>	1.67

### Conclusion

Gender inequality exists in Punjab province. It is affecting many fields especially literacy rate, labor force participation rate and health facilities. The result shows that male-female literacy rate, primary schools teachers, primary enrollment and labor force participation rate has positive and significant relationship. R2 shows that there is 0.94 percent variation in dependent variable due to independent variables. Infant mortality rate shows that there is insignificant relationship between the literacy rates. For improving the literacy rate more female schools should be opened, new school teachers should be appointed especially in rural areas and also appointment of female teachers in primary female school of rural areas is demand of time. Government should make the policies, free school fees, free books, merits scholarships and need based scholarships that encourage the people to send their daughters in school that will improve the literacy rate.

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