THE IMPACT OF EDUCATION AND HEALTH ON ECONOMIC GROWTH: AN ECONOMETRIC STUDY OF PAKISTAN (1970-2010)

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And which of your Lord's blessing would you deny? All praise be to Allah the most gracious, compassionate and ever merciful Who gave me the power to do, the right to observe and the mind to think, judge and analyze. I am indebted to people whose guidance and encouragement have meant a great deal to me.

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Abstract

Education and health are the two important components of human capital. Education is a powerful instrument in reducing poverty, enhancing earnings, economic growth, empowering people, and promoting a healthy and flexible environment and creating competitive economy. It plays an important role in shaping the ways to become skilled and handle with the complexities of economic growth by the future generations. On the other hand health is a basic and key ingredient of human capital and an important determinant of economic growth. The main objective of this study was to examine the impact of education and health on the economic growth of Pakistan, using time series data from 1970-2010. To achieve this objective, the study was completed in different phases. In the first phase, a comprehensive literature review was carried out using standard sources and tools for the better understanding of theoretical and emperical aspects of the study. In the second phase secondary data were collected from the State Bank of Pakistan and World Development Indicators. A total of eight variables was selected for the study i.e. public spending on education and health, enrollment at primary, secondary and tertiary level, life expectancy and infant mortality rate. The collected data for these variables was analyzed using computer software EViews version 5. During data analysis different econometric techniques were applied to examine the stationarity of data and long run and the short run relationship between education, health and economic growth. For stationarity, long run and short run relationship Augmented Dickey Fuller (ADF) and Philips Perron (PP) tests, Engle Granger two step procedure, Auto Regressive Distributive Lags (ARDL) and Error Correction Mechanism (ECM) were used respectively. The validity of ARDL and ECM models was checked by Auto Correlation, Heteroscedasticity, Auto Regressive Conditional Heteroscedasticity, and parameter stablity tests. The results of these tests confirmed that these models are best fitted.

The findings of Augmented Dickey Fuller and Philips Perron tests show that all variable are unit root at level and stationary at first difference or co-integrated of order one. The results of Engle Granger two step procedure and ARDL tests confirmed that education, health and economic growth have a long run relationship whereas, Error

Correction Mechanism also confirmed their short run relationship. The results of linear regression show that education and health have a positive and significant impact on the economic growth of Pakistan.

This study also found that education; health and economic growth are co-integrated and have a long run relationship. Health and education play a major and important role in determining the long run economic growth of Pakistan. The study confirmed that if government increases budget for education and health, more people will be educated which will result in more educated workers and resultantly more production. Similarly, it will also have a good impact on the health of the general public.

The study suggests that the government of Pakistan should consider education and health sectors while formulating policies and must allocate sufficient budget for them.

Chapter	Title	Page
Acknowledgements		i
Abstract		ii
Table of Contents		iv
List of Tables		ix
List of Figures		xii
List of Abbreviation		xiii
Chapter-1		
Introduction		**1-7**
1.1	**Background of the Study**	**1**
1.2	**Statement of the Problem**	**3**
1.3	**Objectives of the Study**	**4**
1.4	**Research Methodology**	**5**
1.4.1	Data Sources	5
1.4.2	Model Specification	5
1.4.3	Econometric Methodology	6
1.5	**Organization of the Study**	**6**
Chapter-2		
Literature Review		**8-21**
2.1	**Introduction**	**8**
2.2	**Theoretical Discussions**	**8**
2.3	**Empirical Studies**	**14**
2.4	**Summary**	**21**
Chapter-3		
Materials and Methods		**22-34**
3.1	**Introduction**	**22**
3.2	**The Data**	**22**
3.3	**Methodology**	**22**
3.3.1	**Graphical Analysis of Variables**	**23**
3.3.2	**Unit Root Testing**	**23**
3.3.2.1	Augmented Dickey Fuller Test	23
3.3.2.2	Phillips Parren Test	24
3.3.3	**Cointegration**	**25**
3.3.3.1	Eangle Granger Two Step Cointegration	25
3.3.3.2	Auto Regressive Distributive Lags (ARDL)	26

3.3.4 Linear Regression Line **27**

3.3.5 Error Correction Mechanism **27**

3.3.6 Diagnostic Tests **28**

3.3.6.1 Auto-correlation 29
3.3.6.1.1 Breusch-Godfrey Test 29
3.3.6.2 Heterosdaskcity 30
3.3.6.2.1 White Test 30
3.3.6.3 ARCH 30
3.3.6.4 Parameter Stability 31
3.3.6.4.1 Cusum 32
3.3.6.4.2 Cusum Square 32

3.4 Summary **33**

Chapter-4

The Retrospective Study of Education Sector **35-72**

4.1 Introduction **35**

4.2 Historical Background **35**

4.3 Educational Policies over the Study Period **36**

4.3.1 New Education Policy 1970 **36**

4.3.1.1 Areas of Reforms 36
4.3.1.2 Major Recommendations 37

4.3.2 The Education Policy 1972-80 **38**

4.3.2.1 Objectives of Education Policy 1972-80 39

4.3.3 National Education Policy 1979 **40**

4.3.3.1 Recommendations of Education Policy 1979 41

4.3.4 National Education Policy 1992-2002 **42**

4.3.4.1 Main Recommendations of Education Policy 1992 43
4.3.4.2 Achievements of Education Policy 1992 44

4.3.5 Education Policy 1998 **45**

4.3.5.1 New Initiatives of Education Policy 1998 45
4.3.5.2 Targets of Education Policy 1998 47

4.3.6 Education Policy 2009 **47**

4.3.6.1 Features of Education Policy 2009 48

4.4 Five Year Plans over the Study Period **50**

4.4.1 4th Five Year Plan (1972-78) **51**

4.4.1.1 Main Objectives of the 4th Plan 51
4.4.1.2 Proposed Developments of the 4th Plan 54
4.4.2 5th Five Year Plan 56
4.4.2.1 Plan Objectives 59
4.4.2.2 Physical Targets 60
4.4.3 6th Five Year Plan (1983-88) 61
4.4.3.1 Major Physical Targets 63
4.4.4 7th Five Year Plan (1988-93) 63
4.4.4.1 Main Objectives of the Plan 64
4.4.4.2 Major Targets 64
4.4.5 8th Five Year Plan (1993-98) 65
4.4.5.1 Physical Targets 66
4.4.6 Education Sector Reforms (ESR) (2001-05) 67
4.4.6.1 Mission Statement 68
4.4.6.2 The Vision 68
4.4.6.3 Strategies 68
4.4.6.4 Policy Statement 68
4.4.6.5 Objectives 69
4.4.6.6 Targets of ESR 69
4.4.6.7 ESR's Financial Requirements for (2001-05) 70
4.4.6.8 Achievements of ESR 71
4.5 Summary 72
Chapter-5
The Retrospective Study of Health Sector 73-100
5.1 Introduction 73
5.2 Historical Background 73
5.3 Health Policies over the Study Period 73
5.3.1 Alma Ata Declaration 1978 73
5.3.1.1 Main Points of Alma Ata Declaration 73
5.3.2 Health Policy 1990 75
5.3.2.1 Goal of Health Policy 1990 75
5.3.2.2 Objectives of Health Policy 1990 75
5.3.2.3 Major Targets of Health Policy 1990 75
5.3.2.4 Main Features of the Health Policy 1990 76
5.3.2.5 Implementation of the Health Policy 1990 76
5.3.3 Health Policy 1997 76
5.3.3.1 Vision of Health Policy 1997 76

5.3.3.2 Objectives of the Health Policy 1997 78
5.3.3.3 Strategies for the Health Policy 1997 78
5.3.3.4 Areas of Priority of Health Policy 1997 79

5.3.4 National Health Policy 2001 79

5.3.4.1 Key Features of Health Policy 2001 80
5.3.4.2 Overall Vision of Health Policy 2001 80
5.3.4.3 Specific Areas of Reforms 80

5.3.5 Health Policy 2009 81

5.3.5.1 Principles of Health Policy 2009 81
5.3.5.2 Vision of Health Policy 2009 82
5.3.5.3 Objectives of Health Policy 2009 82
5.3.5.4 Strategic Priorities 82

5.4 Five Years Plans over the Study Period 83

5.4.1 4th Five Year Plan (1970-78) 83

5.4.1.1 Objectives of 4th Plan 83
5.4.1.2 Major Targets of 4th Plan 84
5.4.1.3 Physical Achievements of 4th Plan 86

5.4.2 The 5th Five Year Plan (1978-83) 86
5.4.2.1 Objectives & Targets of the 5th Plan 86
5.4.2.2 The Main Strategy during the 5th Plan 87
5.4.2.3 Specific Quantitative Targets of 5th Plan 87
5.4.2.4 Physical Targets of 5th Plan 88
5.4.2.5 Physical Achievements of the 5th Plan 89

5.4.3 The 6th Five Year Plan (1983-88) 89

5.4.3.1 Objectives of 6th Plan 89
5.4.3.2 Policy Shifts of 6th Plan 90
5.4.3.3 Targets of 6th Plan 90
5.4.3.4 Physical Targets Achieved during 6th Plan 92

5.4.4 The 7th Five Year Plan (1988-93) 92

5.4.4.1 Objectives of 7th Plan 92
5.4.4.2 Major Policy Directions 93
5.4.4.3 New Initiatives of 7th Plan 93
5.4.4.4 Strategy for National Health Care System 93

5.4.5 The 8th Five Year Plan (1993-98) 94

5.4.5.1 Policy Initiatives of 8th Plan 95
5.4.5.2 Landmarks of 8th Plan 96
5.4.5.3 Physical Targets of 8th Plan 96

5.4.6 Health Sector Reforms 98

5.4.6.1 Objectives of the Health Sector Reforms 98
5.4.6.2 Guiding Principles for Health Sector Reforms 99

5.5 Summary 100

Chapter-6

Results and Discussions 102-122

6.1 Introduction 102

6.2 Graphical Analysis of Variables 102

6.3 Unit Root Tests 106

6.3.1 Augmented Dickey Fuller Test 107
6.3.2 Phillips Perron Test 108

6.4 Cointegration 108

6.4.1 Engle Granger Two Steps 109
6.4.2 Auto Regressive Distributive Lags 110
6.4.2.1 Parsimonious ARDL Model 112
6.4.3 Diagnostic Tests for Parsimonious ARDL Model 114

6.5 Empirical Results of Linear Regression Model 116

6.6 Error Correction Model 117

6.6.1 Parsimonious ECM 118
6.6.2 Diagnostic Tests for Parsimonious ECM 119

6.7 Summary 121

Chapter-7

Summary, Conclusions and Recommendations 123-130

7.1 Introduction 123

7.2 Summary and Findings of the Study 123

7.3 Conclusions 126

7.4 Recommendations 127

7.6 Policy Implication 129

References 131-146

Appendices 147-158

List of Tables

Table 3.1	Definition and sources of variables	34
Table 4.1	4th Plan Break up for Education Policy 1970	38
Table 4.2	Public Sector Allocation under Education and Training during 4th Plan	55
Table 4.3	Requirement of the Recurring Expenditure during 4th Plan	56
Table 4.4	Total Expenditure under 4th Plan	56
Table 4.5	Financial Requirement for Education Sector during 5th Plan	59
Table 4.6	Education & Financial Allocation during 6th Plan	62
Table 4.7	Public Sector Allocation for Education during 7th Plan	64
Table 4.8	Public Sector Allocation for Education during 8th Plan	66
Table 4.9	Education Sector Reforms Targets	70
Table 4.10	Financial Requirements for ESR during 2001-05	70
Table 5.1	Targets for Vision 2010	77
Table 5.2	Public Sector Allocation for Health during 4th Plan	84
Table 5.3	Physical Targets for Health Sector during 4th Plan	85
Table 5.4	Physical Achievement in Health Sector during 4th Plan	86
Table 5.5	Physical Targets for Health Sector during 5th Plan	86
Table 5.6	Allocation for Health during the 5th Plan	88
Table 5.7	Physical and Health Manpower at end of 6th Plan	91
Table 5.8	Capital Outlay for Health during 6th Plan	91

Table 5.9	Health Sector Allocation for 7th Plan year wise	94
Table 5.10	Physical Targets for 8th Plan	96
Table 5.11	Financial Estimates for Health Sector during 8th Plan	97
Table 6.1	ADF Test Results	107
Table 6.2	PP Test Results	108
Table 6.3	Engle Granger 1st step	109
Table 6.4	ADF Results for EG 2nd Step	109
Table 6.5	PP Results for EG 2nd Step	110
Table 6.6	ARDL over Parameterized Model (2 lags)	111
Table 6.7	Wald Test Result (for ARDL 2 lags)	111
Table 6.8	ARDL over Parameterized (one lag)	112
Table 6.9	Wald Test Results (for ARDL one lag)	112
Table 6.10	Parsimonious ARDL Model	113
Table 6.11	Wald Test (Parsimonious ARDL Model)	113
Table 6.12	Results of Auto Correlation	114
Table 6.13	Results of White Heteroskedasticity test	114
Table 6.14	Results of ARCH test	115
Table 6.5	Results of Liner Regression Model	116
Table 6.16	General ECM Model	118
Table 6.17	Parsimonious ECM Model	119

Table 6.18 Results of LM Test 120

Table 6.19 Results of White Test 120

Table 6.20 Results of ARCH Test 120

List of Figures

Figure 6.1 Trends in Log of GDP Per Capita in Pakistan 1970-2010 102

Figure 6.2 Trends in Log of Enrollment at Tertiary Level 1970-2010 103

Figure 6.3 Trends in Log of Enrollment at Secondary Level 1970-2010 103

Figure 6.4 Trends in Log of Enrollment at Primary Level 1970-2010 104

Figure 6.5 Trends in log of Public Expenditure on Education 1970-2010 104

Figure 6.6 Trends in log of Public Expenditure on Health 1970-2010 105

Figure 6.7 Trends in Log of Infant Mortality Rate 1970-2010 105

Figure 6.8 Trends in Log of Life Expectancy 1970-2010 106

Figure 6.9 Cusum for Parsimonious ARDL 115

Figure 6.10 Cusum Square for Parsimonious ARDL 116

Figure 6.11 Cusum for Parsimonious ECM 121

Figure 6.12 Cusum Square for Parsimonious ECM 121

List of Abbreviation

ADF	Augmented Dickey Fuller
AIC	Akaike Information Criteria
AIDS	Acquired Immune Deficiency Syndrome
ARCH	Auto Regressive Conditional Heterosdaskcity
ARDL	Auto Regressive Distributive Lags
ARMA	Auto Regressive Moving Average
BCG	Bacille Calmette–Guérin
BG	Breusch-Godfrey
BHUs	Basic Health Units
CDR	Crude Death Ratio
CT	Certificate in Teaching
CUSUM	Cumulative Sum of Recursive Residuals
CUSUM Square	Cumulative Sum of Recursive Residuals Square
ECM	Error Correction Mechanism
EFA	Education for All
EPI	Extended Programme for Immunization
ESR	Education Sector Reforms
FBS	Federal Bureau of Statistics
FCC	Funding Council for Colleges

GDP	Gross Domestic Product
GNP	Gross National Product
HIV	Human Immunodeficiency Virus
HSR	Health Sector Reforms
ICT	Islamabad Capital Tertiary
ID	Identification
IMR	Infant Mortality Rate
LM	Lagrange Multiplier
MCH	Maternal Child Health
MDGs	Millennium Development Goals
NCHD	National Commission for Human Development
NETS	National Education Testing Services
NFBE	Non Formal Basic Education
NOC	No Objection Certificate
NPA	National Plan of Action
OCED	Organization for Economic Co-Operation and Development
OLS	Ordinary Least Square
ORS	Oral Rehydration Salts
PP	Phillips Perron
PRSP	Pakistan Rural Support Programme

PTC	Primary Teaching Certificate
RHCs	Rural Health Centers
RTIs	Regional Training Institutes
SAP	Social Action Program
SBP	State Bank of Pakistan
T.B	Tubercle Bacillus
UK	United Kingdom
UNICEF	United Nations International Children Emergency Fund
UNESCO	United Nations Educational Scientific and Cultural Organization
UPE	Universal Primary Education
VCM	Vector Correction Mechanism
WDI	World Development Indicators
WHO	World Health Organization

Chapter-1
Introduction

1.1. Background of the Study

Human capital plays an important role in the sustainable economic development of a country. Its role in the economic progress cannot be overemphasized. The development of human capital is a fundamental prerequisite for the transformation of socio-economic and political conditions of a country. Growth economists recognized human capital development as a fundamental factor accountable for the extraordinary performance of most of the developed and developing economies and also a remarkable devotion to human capital development. This development has been attained by the inhabitants of those countries mainly due to improved know-how, talent and ability obtained by way of education and good health. Growth economists have emphasized on the fact that difference of socio-economic development between the developed and underdeveloped countries of the world is not due to natural resources, gifts and the accumulation of physical capital but due to the quantity and quality of human capital.

Growth theories suggest the important role of human capital for economic development. In economic literature human capital has been defined by including education, health, training and migration etc. and all types of investment that improve and develop a person's efficiency. Growth economists paid consideration to education for analyzing its impact on economic growth while ignoring health capital. In the recent times growth economists have also considered health as a component of human capital and tried to calculate the association between health and economic growth (Akram, 2008).

Education and health are the two components of human capital which make an individual more creative and productive. Education is a powerful instrument in reducing poverty, enhancing earnings of people and economic growth, empowering people, promoting a healthy and flexible environment and creating

a competitive economy. It plays an important role in shaping the ways to become skilled and handle with the complexities of the economic growth by the future generations. Educational institutions i.e. Schools, Colleges and Universities etc. prepare individuals to be able to participate actively in all walks of life, including economic activities (Afzal, 2010).

According to World Health Organization (WHO) report on Macroeconomics and Health (2001), health is a basic and key ingredient of human capital and an important determinant of economic growth. The report also stressed on making economic arguments for investing in health.

Many studies (Malik, 2005; Arora, 2001; Final, 2006; Aurangzeb, 2002; WHO, 2002 etc.), have been conducted to find the relationship between health and economic growth, both analytically and empirically. The findings of these studies show that health has a strong, positive and significant impact on economic growth.

Good health improves mental and physical capacities and resultantly labor productivity. A higher labor supply, improved skills from increased access to education and training, and capital formation, through higher saving, are the ways in which health can contribute to economic growth (WHO 2001).

There is a two way relationship between health and economic growth. Health and other forms of physical capital increase the per capita GDP, by increasing the productivity of labor and other resources. Some part of this increased income is, thereafter invested in human capital (Akram, 2008).

During 1790 to 1980 one third of the UK, GDP was the result of improvement in health and particularly improvement in food, public health and medical facilities (Fogel, 1994). According to the World Development Report (2007), the development in the health sector, average life expectancy at birth worldwide rose from 51 years to 65 years in less than 40 years.

Afzal (2010) noted that, "Education has a multidimensional impact on the economy of a country. Education, on one side increases economic growth and, on the other, it reduces poverty. It creates a peaceful political and social environment that attracts investment. Educated workers are more productive, more polite, and eager to follow the rules of business pertaining to socio-economic development. The role of education in building an efficient and effective labor force is well recognized. Education has a positive and a basic role in the development of a nation".

Prosperity and progress of a country depend upon the state of the economy, and the state of the economy depends upon the productivity of labor, which in-turn depends upon education and health of labor (Seebens and Wobs, 2003).

1.2. Statement of the Problem

After the partition in 1947, Pakistan has been facing financial crunches. Due to this problem, Pakistan has little to spend on expanding programs. Low revenues together with the increased defense and debt servicing expenditures, the government has very small funds to spend on expanding programs and particularly on Education and Health sectors. There are very few facilities available to the citizens of Pakistan and especially to the poor people in rural areas. It is due to particularly less spending on health during the previous sixty years. Health spending as percentage of GDP remains as 0.5% to 0.8% during 1970-2010. In fiscal year 2009-10, health spending was only 0.7 % of GDP, which is very low compared to the other Asian countries. In Pakistan, not only the share of health in government expenditure is low but also the access to available health facilities is very difficult. Moreover, in Pakistan priority is given to hospitals, medical colleges and curative healthcare whereas rural health services are being ignored.

Education sector also faces the same problem. The share of education in public expenditure was 1.1% in 1970, 0.8% in 1980, 2.3% in 1990, and only 1% of GDP in fiscal year 2004-05, and 2.3 % in fiscal year 2009-10, which is much

lower compared to other countries in the region. Most of the expenditures on education go to recurring expenditures. In Pakistan, priority is always given to higher education whereas primary and secondary education is ignored with the result that gross primary enrollment was 95% in 2009-10, and literacy rate 55% in 2009-10. Pakistan's health and education indicators, when compared to other Asian countries, represent a depressing picture.

This study was therefore undertaken to investigate the impact of education and health on economic growth. In Pakistan many studies of the same nature have been undertaken either dealing with health or education; however, attempt on the combination of both has been an ignorant area.

1.3. Objectives of the Study

This study has been designed to show the impact of education and health on economic growth, for the period, 1970- 2010. This study will be an important contribution to the literature and also in Pakistan. On the basis of the findings, recommend actions for the improvement of health and education sector have been given. The objective of this study is to analyze the long run and the short run relationship between education, health and economic growth, by using Eangle Granger two step procedures and Auto Regressive Distributed Lag (ARDL) and Error Correction Model (ECM). This study provides a guideline for economists, researchers and policy makers.

Following are the objectives of this research;

1. To investigate the impact of Education and Health on Economic Growth for the period 1970-2010.
2. To examine the relationship between education, health and economic growth;
3. To examine empirically the long run relationship between Education, Health and Economic Growth in Pakistan.
4. To Examine empirically short run relationship between education, health and economic growth.
5. To propose policy measures based on the findings of the study.

1.4. Research Methodology

1.4.1. Data Sources

Annual time series data set was used, which ranging from 1970-2010.The data has been taken from Pakistan Economic Surveys (various issues), Pakistan Labor Force Survey (various issues), "State Bank of Pakistan Annual Reports" (Various Reports) and different reports published by the Federal Bureau of Statistic (FBS), and World Development Indicators (WDI).

1.4.2. Model Specification

To assess the relationship between education, health and economic growth the following model has been estimated using different econometric methods.

The econometric model for this research has been stated as GDP per capita (GDP_PC) depends upon Public Expenditure on Health (ExH), Public Expenditure on Education (ExE), Infant Mortality Rate (IMR), life expectancy (LE), Primary Enrollment rate (EnP), Secondary Enrollment Rate (EnS), and Enrollment Rate at Tertiary level (EnH).

Thus;

Y = f (ExE, ExH, EnP, EnS, EnH, IMR, LE)

GDP per capita has been shown as a proxy for economic growth and proxies for health are public expenditure on health, life expectancy and infant mortality rate and for education, public expenditure on education, enrollment at primary, secondary and tertiary level, are used.

The empirical model for this research is as follows;

$$y = \beta_0 + \beta_1(ExE) + \beta_2(ExH) + \beta_3(EnP) + \beta_4(EnS) + \beta_5(EnH) + \beta_6(IMR) + \beta_7(Le) + \varepsilon_t$$

Where β_0 is the intercept and $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7$ are all the co-efficient with the corresponding regressors, and ε_t stochastic error term.

1.4.3. Econometric Techniques

The investigation was carried out using time series econometric techniques. In empirical macroeconomics these techniques have been used extensively.

Through a sequence of stages, the application of these techniques evolves. Most of macroeconomic time series are not stationary. The first step is to test for stationarity or unit root. Unit root or stationarity in autoregressive time series are essential and important procedures for studying the long run relationship in macroeconomic data. Two tests have received greater attention in econometric literature, i.e. Augmented Dickey Fuller (ADF) and Phillips-Perron (PP). Both these tests are used in this research.

The next step is to test the long run relationship among variables. Cointegration has been used for this purpose. Cointegration tests allow one to identify the existence of long run equilibrium relationships. Eangle Granger two step procedure and ARDL techniques have been used for this purpose. The next step is the estimation of ECM. ECM has analyzed the short run analysis.

Akaike Information Criteria (AIC) has been used for lag length. Statistical packages E-Views version 5 have been used to estimate the coefficients of the model.

1.5. Organization of the Study

This study has been organized into seven chapters. Chapter one consists of concise and brief introduction to the problem. It provides us the details about the topic and the methods used for conducting the study. Chapter two is the literature review. This chapter is based on the extensive literature studying the relationship between education, health and economic growth. This chapter also focuses on theoretical debates and empirical studies. Third chapter discusses Research Methodology. This chapter discusses data sources, analytical framework and econometric models and estimation techniques.

Chapter four is related to the retrospective study of Education sector in Pakistan. This chapter includes different education policies and reforms for education sector and also different five year plans for the uplift of education in the country for the period 1970-2010.

Chapter five is related to the retrospective study of Health sector in Pakistan. This chapter also includes different health policy measures and five year plans undertaken by the government of Pakistan for the uplift of health sector for the period 1970-2010.

Chapter six discusses the results and analysis of the data. Chapter seven gives the summary of findings, conclusion, recommendations and policy implications.

Chapter 2

Literature Review

2.1. Introduction

In studying a problem the relevant literature review has a very important place. It highlights the background of the problem and also some research techniques are gained from previous studies. This chapter evaluates the earlier work done on education, health and economic growth, both theoretically and empirically. Education, health and economic growth have been focused specially. The main purpose of theoretical debates is to review some of main theoretical arguments regarding Education, Health and Economic growth. There are a good number of studies that examines the relationship between education, health and economic growth. The results of these studies confirmed the relationship between education, health and economic growth.

2.2. Theoretical Discussion

In 1960,s economic growth theory consisted mainly of the neo-classical models, developed by Solow and Swan (1956). The economic growth models of these two gave rise to a broad range of literature on economic growth. These economic growth models centered macroeconomists' attention on tangible capital formation as the main force of economic growth. According to Solow models, capital and labor could not explain the economic growth alone. His goal was to define the contribution of the factors of production and technology. However, these growth models showed that due to diminishing marginal returns in substituting physical capital for labor, the accumulation of capital would not indefinitely support a steady rate of growth in labor productivity.

According to neo-classical models, the output of an economy grows as inputs of capital and labor increases. Non-economic variable i.e. human capital has no role in these models, and also the law of diminishing returns to scale operative in the economy. With these assumptions these models showed that as the capital stock increases, the growth of economy slows down, and in order to keep the same pace, it must improve the technology. This type of mechanism in

the neo-classical growth model is neither inherent not does it try to explain much, it means that the technological progress is exogenous to the system. During the 1950, s and 1960, s Solow theoretical structure supported policies that focused on the expansion of industries, capital stock and the rate of saving as the channel to stimulate economic growth and higher income per capita. According to the neo-classical models countries want to develop and augment the capital stock, they need to save and invest more.

Neoclassical model takes technological progress as exogenous and long term growth directly related to diminishing returns to capital and this reason has limited the analytical capacity of the model.

In the mid-1980s, a new theory was developed, mostly due to the Romer (1986), which is known as "Endogenous Growth Models". These recent models of economic growth take technology as endogenous; as technology determines economic growth in an endogenous way therefore they are known as "Endogenous Growth Models". This literature has proved to be providing numerous different explanations of the process of economic growth.

Endogenous growth models don't assume physical capital accumulation as the key element shaping the economic growth. These models also reject the neo-classical theory of diminishing returns. According to endogenous growth theory a country with a higher level of investment can get a high level of per capita income and can also sustain in future a high rate of growth per worker.
The most important thing in endogenous growth models is vital factors of production, which contributes growth, or the rate of accumulation, and the initial stock of human capital. Human capital is increased as a result of education, on job training and improved health facilities etc. with increased human capital; labor's productivity is increased without adding more physical capital to production. These models assume technological progress, as a function of the level of human capital, with the supposition that an educated labor force is good at creating, applying and familiarizing new technologies.

According to Solow models, families can save into holding of physical capital. On the other hand "Endogenous Growth Model" advocated that, households can save and invest in education and health, which increase the market value of labor. Such saving may help the individual or household directly or it may adopt a more noble form in which parents invest in the education of their children.

Romer (1986) broadens the concept of capital by including human capital. According to these models the law of diminishing returns may not be operative. This means that if a firm invests in capital also invest in employ's education and skills. Workers, who are also healthy, can produce more and use the capital and technology more efficiently.

From the model of Romer onward different studies have been tried to identify the determents of economic growth. Different variables have been examined, and some of them have been accepted as being economically and statistically significant in explanation of growth. Growth economists accept generally human capital to be one of these variables. Human capital's role is generally viewed as being vital to the process of economic growth. Continuous growth rest on levels of human capital, whose stocks increase as results of better education, better health and new learning and training etc. A country with a minimum level of education and health would not be able to sustain a high level of growth.

The processes of technological change have been fleshed out by endogenous growth models with the introduction of human capital.

With the work of Romer (1986), research on economic growth has experienced a boom. Endogenous growth theories mainly focused on more productivity that derived from technological progress and developed human capital in the form of education and health.

According to Lucas (1988), "Human capital as one of the important factor in production function and education as a mean of human capital accumulation,

not fundamentally different from physical capital, only formed by workers through certain activities i.e. education and on the job training." Lucas considered education as a mean for human capital accumulation and also a factor of production. It means that improving the education level of the labor force has a strong impact on productivity.

Another view of analysis moves attention away from considering human capital as direct input to the production of goods, instead its emphases on other activities practiced by skilled labor, more importantly innovation. Technological change revolting from research and development investment that produces a better range of goods is the main form of innovation recognized by the endogenous growth literature.

This view of analysis brings about the important point that when human capital is modeled as a factor of production affecting innovation, the long run rate of productivity growth is positively affected by human capital stock level.

Endogenous growth models advocate for a wide arena of public policy action. These models recommend that the rate of accumulation of both physical and human capital could be affected by government policies. With knowledge been treated as a public good, spill over benefits to other firms may then allow investment in knowledge to show increasing returns to scale. This in turn allows investment in knowledge capital which will sustain long term growth in per capita income.

Human capital contributes growth by increasing productivity, helps in the invention of new technology and enabling their adoption. Preliminary level of education effect the growth rate of countries and low income economies converge faster when their initial stock of human capital is larger, and this stock affects growth rates by increasing productivity.

Human capital is the main factor in explaining economic growth (Mankiw 1992), as it increases the output through several manageable and unmanageable

ways. Human capital empowers a worker to produce more output. Increase in human capital is a must for maximum utilization of physical capital. Improvement in human capital anywhere in the world attracts investment in physical capital and which leads to increase production (Abbas, 2000 and 2001).

It is generally considered that the main objective of education is to develop human capital, but this type of capital is not developed by education alone. Some social activities and other actions also develop human capital and also contribute to the accumulation process.

Historically, human capital has been defined as education accomplishment only while ignoring health. Recently health has been acknowledged as an important component of human capital.

Up to the second half of 1990s human capital's role consisted of education, although some growth economists accepted the importance of other factors too i.e. health and nutrition. Mankiw, Romer and Weil (1992), Fogel (1994), Barro and Sala (1995), first include health with education in a border concept of human capital. They examined the relationship between economic growth and health. According to Fogel (1994), a part of education, better health, and physical strength etc. also contribute to the level of accumulation of human capital.

Health and economic growth interact in different ways. Improved health increases the productivity of a worker by increasing physical capacities i.e. strengthens, endurance and also their mental capacities, cognitive functioning and reasoning skills. It has been proved that health has a major impact on increasing labor productivity.

Good health in children has a direct impact on school attendance and student performance. It increases the cognitive and reasoning ability. Children with poor health have lower educational attainment (UNESCAP, 2011). According

to Case, Fertige and Paxson (2005), children with lower health receive fewer years of schooling. Those students how have serve health problems get almost 20% less of schooling than their healthier counterparts.

Increased economic growth changes lifestyle. Higher incomes empower people to live in a good environment, consume quality food items and involve their self in regular physical activities.

Leeuwen (2007) described human capital implicitly to use formal and informal education but it also contains other factors such as the costs of raising children health and ability. So the components of human capital are recognized as education and health, but education comes ahead of health. In connection with this Igun (2006) explains human capital as the total stock of knowledge, skills, competences, innovation abilities possessed by the people of a country.

Economists have identified other components of human capital other than education and health. Nakamura (1981) defines human capital for pre-modern japan as labor and managerial skills, entrepreneurial and innovative abilities, plus physical strength and skills. As he considered human capital on one hand the ability and education and on the other hand the cost of physically raising a child healthy.

Appleton and Teal (1998) described that human capital is a wide concept which include human characteristics which can be acquired through education but it also includes their health, physical strength and vitality. This makes education and health the most important factor of human capital. This means that human capital theory focus on health and education as the inputs of economic production.

An educated person knows the cost and benefits of actions which have health effects than a person with lower levels of education. Smoking, substance abuse and other high risk behavior are some of the actions that are closely related to a lack of education. Educating children and adults can have a significant impact

on such behavior. Educated mothers are more likely to send children to school to keep them clean, healthy and teach them healthy habits.

2.3. Empirical Studies

Education at all levels contributes to economic development through imparting general attitudes and discipline and specific skills necessary for a variety of workplaces. It supports economic growth by increasing health facilities, reducing fertility and contributes to political stability also. For any labor market the importance of educational system depends on its ability to produce a literate, efficient, and flexible labor force through education. So with economic development new technologies are used in production, which resulted in increase demand for skillful and educated workers. Lucas (1988) showed that the development of human capital is dependent on the amount of time allocated by a person to learn a skill.

Investment of time and resources in human capital, originate from the fact that human capital has a basic and important role in economic growth (Mathew, 2012). In the words of Todaro and Smith (2003), top priority must be given to human capital in its own right, not only in developed counties but also in developing countries that wish to come out of the vicious circle of poverty.

Schultz, (1961) identifies the following five strategies for human capital development.

i) Investment in health facilities and services,
ii) On the job training;
iii) Formal education;
iv) Non-formal education and study programs for adults, and
v) Migrations of individuals and families.

All these strategies will make an individual more productive, and investment of time and resources in health and education sectors will develop human capital.

Countries where enrollments in educational institutions are high made a faster growth in per capita income, (Bils & Klenow, 2000). Similarly providing improved health facilities also increase per capita Gross National Income (Malik 2006).

Dauda (2009) by using ARDL and ECM technique analyzed that there is positive relationship between human capital and economic growth in Nigeria. All variables used in the model (Enrollment at the primary, secondary and tertiary level) have positive signs.

Abbas (2000) conducted a comparative study of Pakistan and India on the role of human capital in economic growth for the period 1970-1994, using a growth accounting framework. He conducted this study in two steps. In step first he analyzed the impact of education on economic growth and secondly he combined education at primary, secondary and tertiary levels with employment to study effective labor input. The results of the study confirmed that human capital proxies by education at different levels and combined with employment has a strong and significant impact on economic growth.

Abbas (2001) using school enrollment rates, analyzed the impact of human capital on economic growth in Pakistan and Sri Lanka. The study revealed that secondary and higher enrollment rates have a positive while primary enrollment rates have a negative impact on economic growth in both countries. For effective labor force input, author combined different level of enrollment rates with employment. The study found that the effective labor force has a strong and positive impact on economic growth. The study recommends that for economic growth, investment in human capital is a must.

Mustafa, Abbas, and Saeed (2005) stressed upon the role of vocational training and human resources development for the economic growth in Pakistan. They explored the changes in the number of institutions, enrollment and teachers on output growth variability. The study confirmed that vocational education

training, and human resources have a significant and positive impact on the output growth.

Abbas and Foreman-Pack (2007) using Engle Granger cointegration, estimate the effect of human capital on economic growth in Pakistan for the period 1963-2003. They used the secondary enrollment as proxy for education and public spending on health as a proxy for health. The study confirmed that increasing investment in health sector increases the physical and human capital.

For the data set of 1950 to 2005 Madsen et al. (2008) studied the Indian growth and also a dataset of 590 Indian firms for the period 1993-2005 to find the endogenous growth in India. Cointegration was used for estimation with augmented human capital production function. The study found that total factor productivity and research activity have no long run relationships.

Using 2-Stage Least Square technique Bloom et al (2004), finds that schooling and life expectancy have a significant and positive effect on GDP. Improvement in health not only increases production through labor efficiency, but through capital growth also.

Malik (2006), measured health status by life expectancy rate, infant mortality rate and per capita Gross National Income as a proxy for economic growth, using 2-Stage Least Square technique, the study confirmed that the health indicators have a good effect on economic growth.

Fogel (1994), using data on mortality rates, finds that nearly 1/3 income growth in the UK during 1790 to 1980 was due to improvement in health facilities, better nutrition and better medical facilities. He also found that public health and medical care must be recognized as labor enhancing technological change.

Jamison (2003) analyzed the contribution of health on economic growth. He measured males' survival rate at age 15 and 60 years and found that about 11% of growth is due to better health, and concludes that for boosting the economic

growth, investment in physical capital and in human capital especially in education and health have important roles to play.

Bhargava et al (2001) using the adult survival rate as a proxy for health. The study found a positive relationship between health and economic growth. They also use another proxy for health i.e. life expectancy. The results remain the same. The study also found that population growth has a negative relationship with economic growth.

Weil (2001) using the average height, adult survival rate and life expectancy as proxies for health. He found that approximately 17 to 20 % variation in income in different countries can be explained by difference of health status across different countries.

Schultz (2005) using different proxies for health, studies the impact of health on total factor productivity. The study confirmed that good health has a positive impact on worker's wages and productivity.

Afzal et al (2010) using ARDL cointegration technique, conducted a study. on the relationship on edcucation and health. The results of the study confirmed the existence of the long run relationship between real GDP and primary and secondary enrollment ratios.

The rate of schooling success in the adult population for the period 1960-1985 in 129 countries have studied by Barro and Lee (1993) using primary, secondary and higher level of education. The study confirmed that all levels of education have significant explanatory capacity and a positive and direct relationship with GNP. Against this, Benhabib and Spiegel (1994) using the number of years of education of the working population to measure the growth rate of human capital. The study found that there is no relationship between education of the working population and per capita output. However, human capital plays a good role as determents of increase in per capita income.

Gylfason and Zoega (2003) found that across the countries, three different measures of education first secondary enrollment, second public spending on education and a third expected years of schooling for girls, all these varies directly with economic growth. They confirmed that education develop economic growth by increasing and improving human, physical and social capital.

Using Lucas (1988) growth model, Gutmea and Mekonnen (2004) concluded that education plays an important role in the economic growth process.

Muskbaw and Rasak (2005) using Johansson cointegration, conducted a study, the results of the study suggest that there is a long run relationship between enrollment at the primary, enrollment at tertiary level and economic growth. The study showed that a well-educated labor force possessed a positive and significant and strong impact on economic growth in Nigeria.

David et al (2004), using different human capital proxies for education and health (enrollment at primary, secondary and higher level, life expectancy etc.) concluded that health has a positive effect on economic growth. The study suggests that a one year improvement in a population life expectancy contributes to an increase of 4% in output. This indicates that increased expenditure in improving health is justified.

K.K, Ogujiba (n.d.) has explored empirically the relationship between economic growth and human capital development in Nigeria, using cointegration and ECM. The study showed that investment in human capital (education & training) have a strong impact on economic growth.

Using cointegration modeling technique and Toda and Yamamoto causality test, Chudary (2009) studied that there is a long run relationship between human capital and economic growth in Pakistan.

There are many channels through which health can affect output. It is confirmed by many studies that healthy workers are better workers, because

these health workers can work longer and harder. This is a direct channel by which health influences the output. The indirect channel is improving in health raise the incentive to acquire schooling. Healthy students are less absent from school and also receive a better education. The improvement in health leads to improvement in mortality levels which in turns lead to people saving for retirement and finally raise the level of investment and physical capital per worker.

Jocelyn Final (2006) concluded that health plays an important role in the economic growth process, using three different approaches for testing the effect of health on economic growth. Three approaches are direct labor productivity effect, the interactive effect and the incentive effect. Different proxies were used (birth attended by skilled health staff, hospital beds per 1000 population, doctors per 1000 population, immunization rate, sanitation facilities and clean water, life expectancy, adult male mortality, death rate). The results of the study confirmed that health and economic growth has positive correlation, and improvements in health have a positive influence on economic growth and also on higher education.

Babatunde & Adefabi (2005) investigated the long run relationship between education and economic growth in Nigeria, using Johansen cointegration . Two channels were analyzed through which human capital can affect economic growth. The results of the study suggest that there is a long run relationship between enrollment at different levels of education and workers' productivity. The study supports that human capital is a source of economic growth.

Philippe Aghion, Peter Howitt and Fabrcie Martin (2010), combined Lucas (1988) and Nelson-Phelps (1966), models of human capital and economic growth, for the period 1960-2000 for OCED countries. The study found that better life expectancy enhances both income and growth and also reducing mortality is specially growth enhancing.

Aurangzeb (2001), using Augmented Solow Growth Model in a Cobb-Douglas functional form for the annual time series data of Pakistan's economy. Using Johnson cointegration and ECM techniques. The study confirmed the existence of a strong and stable relationship between health expenditure and economic growth in Pakistan.

Faisal and Waheed (2011) conducted a time series study in Pakistan for the period 1978-2007. The study confirmed the long run positive relationship between human capital and economic growth.

Chatterji (2008) conducted a study in India. The study confirmed that returns from education are higher in those areas especially where development is low, and although that the rates of return of primary education are quite low, but this is also true that primary education variable that has the largest possible impact, and this also suggest that primary education has the Lucus type externalities. This study also confirmed that investing in education and especially in backward people is counterproductive and the same is for female.

The source of growth in Sri Lanka was studied by Duma (2007), for the period 1980 to 2006 using the growth accounting framework. A human capital augmented Cobb-Douglas production function was used in the study, taking growth in labor; growth in physical capital and growth in human capital as an independent while output growth was taken as dependent. The residual term in the equation captures all the unexplained variation in the output growth. Duma found a very low contribution of human capital to growth. He founded that from 1980 to 2006 human capital contributed only 10% to output growth while the contribution of physical capital and labor were 17% and 27% respectively. The residual term total factor productivity contributed 46%. He ended up with the result that in Sri Lanka's sources of growth after 1980, total factor productivity played a major role.

Arora (2001) using different proxies for health (Life expectancy, structure of adulthood) conducted a study in 10 industrial countries. The study confirmed

that improvement in health status has increased the speed of long-term economic growth by 30-40 %.

2.4. Summary

This chapter has reviewed the relationship between education, health and economic growth both theoretically and imperially. The results of all these studies showed that education and health have a very important impact on economic growth. In Pakistan the importance of education and health on economic growth cannot be overlooked, as these have strong bearing on economic growth. From this review it is observed, that such study may also be needed for Pakistan too. So the current study is designed to show the impact of education and health on economic growth for the period 1970-2010.

Chapter 3

Research Methodology

3.1. Introduction

This chapter deals with data sources followed by analysis and methodology. Analytical framework has been presented and discussed in detail. Econometric models have been used are explained. Engel and Granger two step procedure and Auto Regressive Distributed Lag (ARDL) are used for cointegration between education, health and economic growth. Error Correction Mechanism (ECM) is used to analyze the short run relationship. Some diagnostic tests were also conducted for the checking Auto correlation, Heteroscedasticity, Auto Regressive Conditional Heteroscedasticity (ARCH) and parameter stability of parsimonious ARDL and ECM models. E-views version 5 is used for analysis.

3.2. The Data

The details of all variables used, are given in Table 3.1. Annual time series data for the sample period 1970-2010 is used. Secondary data were obtained from the following sources namely;

1. "Federal Bureau of Statistics, Government of Pakistan".
2. "Economic Survey of Pakistan, (Various Issues)".
3. "State Bank of Pakistan, Yearbook, Annual and Quarterly reports (various issues)".
4. "World Development Indicators (WDI)".
5. "UNESCO".

3.3. Methodology

Before the empirical estimation of the model of time series data, it is necessary to check for stationarity, as in this study time series is used, so it will be of great importance to check and find out whether the series is stationary or non-stationary. Checking stationarity or unit root of the residuals is a significant test for the validity of the long run equilibrium. Augmented Dicky Fuller (ADF) and Philips Perron (PP) tests are used to find out the stationary.

3.3.1. Graphical analysis of variables

This method is also very common among economists and policy makers. This analysis gives the real picture of the trends of the concerned variables. It also gives the direction in which these variables move. (With the help of graphical analysis we have checked the stationarity or unit root also).

3.3.2. Unit Root Testing

To check the stationarity of the given time series data, ADF and PP tests are used. The AIC method is used to select optimum lag for these tests. For each variable separate test is conducted.

Following are the details and procedure of tests used for checking stationarity.

3.3.2.1. Augmented Dickey Fuller Test (ADF)

In conducting ADF test, the following equations are used at level,

$$y_t = \rho y_{t-1} + u_t ------(1)$$

With no intercept and trend.

$$y_t = a + \rho y_{t-1} + u_t -------(2)$$

With intercept,

$$y_t = a + \beta t + \rho y_{t-1} + u_t --------(3)$$

With intercept and trend,

Here "y_t" is the variable of interest "a" is the intercept and "βt" is the trend and $u_t$is the error term.

Then we check the following hypothesis for equation 1, 2 and 3.

H_o: ṕ=1 --------- (4)

The series is unit root.

With

H_A: ṕ≠1. --------- (5)

The series is stationary.

If the null hypotheses is accepted that is ṕ=1then the series is unit root, and if the ṕ≠1 then the series is stationary. If the variables are stationary at a level then they are integrated of order zero or I (0), or they have no long run relationship.

If the problem is not solved at level, then we checked the stationarity by taking the difference of variables. Once without intercept and trend, once with intercept and once with intercept and trend.

Following are the equations of different variables for checking stationarity using the ADF test,

$$\Delta y_t = \gamma y_{t-1} + \sum_{i=1}^{q} \theta_i \, \Delta y_{t-1} - - - - - - - - (6)$$

Without trend and intercept,

$$\Delta y_t = a + \gamma y_{t-1} + \sum_{i=1}^{q} \theta_i \, \Delta y_{t-1} - - - - - - - - - - (7)$$

With intercept,

$$\Delta y_t = a + \beta t + \gamma y_{t-1} + \sum_{i=1}^{q} \theta_i \, \Delta y_{t-1} - - - - - - - - - (8)$$

With intercept and trend,

Here "Δ"is the difference operator and "a" is the intercept term and "βt" is the trend term "q" is the number of lag length.

Again we checked the hypothesis as stated earlier.

If the variables are stationary at 1st difference then they are integrated of order one or I (1). To find out the appropriate order of the model, compute the above equation over a selected grid of values of the number of lags q and finding the value of P where the AIC attains its minimum, critical values tabulated by Mackinnon (1991) are used.

3.3.2.2. Phillips and Parren Test (PP)

Phillips and Perron (1988) use a nonparametric method to correct the serial correlation of the disturbances. The test is based on the long run variance of residuals. Basically this test is a generalization of the Dickey-Fuller procedure that allows for the distribution of the errors.

This test also uses the same equations of the ADF test as stated earlier. For checking stationarity at level equation 1, 2 and 3 have been used, and at first difference equation 6, 7 and 8 have been used.

The hypotheses are checked at a level and at first difference and the critical values of MacKinnon (1991) are used.

3.3.3. Cointegration

The main idea of cointegration test is the specification of models, which includes the long run movement of one variable relative to others, or in other words it shows the long run equilibrium between two variables. If these time series are differences once and they become stationary and if there are one or more linear combination among the series that are stationary then these series can be co-integrated. And if these series is co-integrated then there is a constant long-run linear relationship among them.

The cointegration test was first introduced by Engle and Granger (1987) and then developed by and modified by Stock and Watson (1988), Johansen (1988) and Johansen and Juselius (1990).

In the present study we have used Engle and Granger two step procedure for cointegration and ARDL for checking long run relationship among the variables.

3.3.3.1. Engle and Granger Two Steps Procedure for Cointegration

Following are the steps involved in the test,

It is assumed that all the variables are stationary, which is the necessary condition for the further testing procedure. For this purpose we have used ADF and PP tests for checking stationarity.

(1) Estimate the long run relationship by running the following regression

$$logy_t = logExE + logEnP + logEnS + logEnT + logExH + logIMR + logLe + e_t \text{----- (9)}$$

After running the regression save the regression residuals,

$e_t = logy_t - logExE - logEnP - logEnS - logEnT - logExH - logIMR - logLe$----- (10)

(2) Check the regression residuals for stationary at level. If these residuals are stationary then these variables are Co-integrated and they have a long run relationship.

3.3.3.2. Auto Regressive Distributed Lag (ARDL)

ARDL approach was first developed by Pesaran et al. (2001). In any ARDL model, a time series is a function of its lagged values, current and lagged values of one or more explanatory variables. In ARDL approach there is no need for pre-testing of possible unit root. ARDL approach can identify that whether a long run relationship between two variables exists regardless the fact that the two variables are unit root or stationary. The most important factor is that ARDL yields consistent long run coefficients that are asymptotic normal, irrespective of whether the given series are order of one I (1), or order of zero, I (0). The estimates obtained through this approach are unbiased and efficient. (Pesaran et al 1994).

Following Pesaran et.al (2001), the ARDL model is as under,

$$\Delta Y_t = \alpha + \sum_{i=0}^{k} b_1 \Delta Y_{t-1} + \sum_{i=1}^{k} b_2 \Delta ExE_{t-i} + \sum_{i=1}^{k} b_3 \Delta ExH_{t-i} + \sum_{i=1}^{k} b_3 \Delta EnS_{t-i} + \sum_{i=1}^{k} b_4 \Delta EnP_{t-i} + \sum_{i=1}^{k} b_5 \Delta EnH_{t-i} + \sum_{i=1}^{k} b_6 \Delta lle_{t-i} + \sum_{i=1}^{k} b_7 \Delta lIMR_{t-i} + \gamma_1 Y_{t-i} + \gamma_2 ExE_{t-i} + \gamma_3 ExH_{t-i} + \gamma_4 EnP_{t-i} + \gamma_5 EnS_{t-i} + \gamma_6 EnH_{t-i} + \gamma_7 lLe_{t-i} + \gamma_8 lIMR_{t-i} + e_t$$ ---------- (11)

Where Δ, is the first difference operator and e_t is a white-noise disturbance term and k is the lag length.

This equation (11) shows that GDP per capita is tend to be influenced and explained by its past values, current and lagged values of explanatory variables

Using AIC, the structure lags are established. After running the regression of equation (11), the Wald test (F-statistics) was computed to differentiate the long run relationship. The null and alternative hypotheses are as follows.

$H_0: \gamma_1 = \gamma_2 = - - - = \gamma_8 = 0$ ---------- (12)

With no long run relationship

$H_A: \gamma_1 \neq \gamma_2 \neq - - - \neq \gamma_8 \neq 0$---------- (13)

A long run relationship exists.

The calculated value of F-statistics will be evaluated with the critical values tabulated in table CI (iii) of Pesaran et al. (2001). This table presents two critical bounds one is lower critical bound and other is upper critical bound. If the calculated value falls in the lower critical bound the explanatory variables are integrated of order zero or I (0), or no long run relationship and if the calculated value falls in the upper bound critical values the explanatory variables are integrated of order one or I (1), or have a long run relationship.

Therefore, if the calculated F-statistic is lower than the lower critical bound, then we cannot reject the null hypothesis. Conversely, if the calculated F-statistic is greater than the upper bound critical value then there is cointegration among the concerned variables. Results will be inconclusive if the calculated value falls between lower and upper critical values.

3.3.4. Linear Regression line

A simple linear regression is used to examine the relationship and analyze the impact of education, health on economic growth, using OLS technique.

The following model has been used for analysis.

$logy_t = logExE + logEnP + logEnS + logEnT + logExH + logIMR + logLe + e_t$------ (14)

3.3.5. Error Correction Mechanism (ECM)

In the regression model long-run equilibrium relationship may occur among variables, but short-run equilibrium may not occur. ECM is therefore used to correct or remove the discrepancy that occurs in the short-run.

For conducting ECM, an over parameterized model is generally expressed to deal with the misspecification problem in the model. Here we follow the methodology of David Hendry from general to specific. According to this

methodology insignificant variable are omitted stepwise from the general or over the parameterized model. The parsimonious ECM is obtained by stepwise removal of insignificant variables until parsimonious ECM is obtained.

ECM shows the speed of adjustment towards the long run equilibrium after a short run shock. For checking ECM the following model has been used.

$$\Delta logY_T = a + \sum_{i=1}^{p} b_i \Delta logY_{T-1} + \sum_{i=0}^{p} b_2 \Delta logExE_{t-i} + \sum_{i=0}^{p} b_3 \Delta logExH_{t-i} + \sum_{i=0}^{p} b_3 \Delta logIMR_{t-i} + \sum_{i=0}^{p} b_4 \Delta logLe_{t-i} + \sum_{i=0}^{p} b_5 \Delta logEnP_{t-i} + \sum_{i=0}^{p} b_6 \Delta logEnS_{t-i} + \sum_{i=0}^{p} b_7 \Delta logEnH_{t-i} + b_8 LR_{t-1} + u_t \text{ ------- (15)}$$

Where "Δ" is the difference operator and "p" is the lag length.
In this equation "LR" is the long run relationship and is as follows,

$$LR_t = logy_t - logExE - logEnP - logEnS - logEnT - logExH - logIMR - logLe \text{--- (16)}$$

This is obtained from the running linear regression of the equation (14) and then saving the residuals as in case of the above case.

3.3.6. Diagnostic Testing

For checking the Autocorrelation, Heteroscedticity, Auto Regressive Conditional Heteroscedticity (ARCH) and for parameters stability, of a parsimonious model of ARDL and ECM, different diagnostic tests have been used. Following are the details of these tests;

3.3.6.1. Autocorrelation

Autocorrelation is a problem, when either the dependent variable or the residual show a correlation with its lagged values. This is a problem because if residuals are correlated with its lagged values, then it affects statistical inferences. In other words, the residuals are completely independent across

observations. But usually the residuals are not independent in time series, rather they are dependent. Autocorrelation may occur due to many factors, they are as

a) Cyclical components
b) Omitted variable bias
c) Functional form misspecification.
d) Data manipulation: secondary effect of smoothing or interpolation techniques in compiling statistics.

For serial correlation we have used the following test;

3.3.6.1.1. Breusch-Godfrey or Lagrange Multiplier Test

Breusch-Godfrey (BG) or Lagrange Multiplier (LM) Test is used for checking the auto correlation.

Following are the steps for conducting this;

1. Estimate your model by OLS and obtain the residuals, e^2t.
2. Regress the residuals, e^2t, on all of the independent variables and also some lags of the residuals. For example, if there is an AR (p) process going on then,

   $e_{t-1}, e_{t-2,} e_{t-3,}$----------$,e_{t-p}$---------- (17)
3. If the sample size is large, then the R^2 from this auxiliary regression will be distributed in the following manner:

   (n - p) $R^2 \sim \chi_p^2$ ---------- (18)

Where p the number of included lags. If (n - p) R^2 exceeds the critical χ^2 at the chosen level of significance, then we reject the null hypothesis of no serial correlation.

3.3.6.2. Heteroscedasticity

One of the important assumptions of the OLS is the Homoscedasticity or constant variance of the error term. Violating this assumption, the efficiency of the entire analysis could be spoiled. Checking this assumption is very vital for

assuring the reliability of the regression results. There are some common tests which are used for the detection of heteroscedasticity; here we use White Test.

3.3.6.2.1. White's Heteroscedasticity Test

This test is used for checking heteroscedasticity in the residuals, (White, 1980). White's test is a test of the null hypothesis of no heteroscedasticity against heteroscedasticity. The test statistic is computed by an auxiliary regression, where the squared residuals are regressed on all possible cross products of the regressors. For example,

$y_t = b_1 + b_2 x_t + b_3 z_t + \varepsilon_t$ ---------- (19)

Where b is the estimated parameters and e the residual. The test statistic is then based on the auxiliary regression:

$e_t^2 = a_0 + a_1 x_t + a_2 z_t + a_3 x_t^2 + a_4 x_t^2 + a_5 x_t z_t + \gamma_t$ ---------- (20)

The F-statistic is an omitted variable test for the joint significance of all cross products, excluding the constant.

For checking constant variance one undertakes an auxiliary regression analysis: One then inspects the R^2.

The Lagrange multiplier (LM) test statistic is the product of the R^2 value and sample size:

$LM = n.R^2$---------- (21)

This follows χ^2, with Degree of Freedom equal to the number of estimated parameters.

3.3.6.3. Auto Regressive Conditional Heteroscedasticity (ARCH)

In traditional econometric models, the variance of the residuals is assumed to be homoscedastic. However, in reality the variance of residuals is not constant or heteroscedasticity. Many economic time series shows large instability over time. These series are called conditional heteroscedcitic. To correct this problem ARCH model was initially proposed by Engle in 1982.

Using OLS an ARCH (q) model can be estimated. Engle (1982) first introduces the methodology to test for the lag length of ARCH errors using the LM test. This methodology is as follows:

1. Estimate the autoregressive model

$$y_t = a_0 + a_1 y_{t-1} + \text{-------} + a_q y_{t-q} + \epsilon_t$$

$$= a_0 \sum_{i=1}^{q} ai\, y_{t-1} + \epsilon_t \text{------} (22)$$

2. Obtain the squares of the error $\in^2$and regress them on a constant and q lagged values:

$\in_t^2 = a_0 + \sum_{i=1}^{q} a_i \in_{t-1}^2$---------- (23)

Where "q" is the length of ARCH lags.

3. Null hypothesis $H_0: a_i = 0$ (In absence of ARCH components) for all. $i = 1,2, \ldots \ldots, q$

Alternative hypothesis, H_1: $a_i \neq 0$ (In the presence of ARCH components),

In a sample of T residuals under the null hypothesis of no ARCH errors, the test statistic TR^2 follows χ^2distribution with q degrees of freedom. If TR^2 is greater than the Chi-square table value, we reject the null hypothesis and conclude there is an ARCH effect in the ARMA model. If TR^2 is smaller than the Chi-square table value, we do not reject the null hypothesis.

3.3.6.4. Parameter Stability

Cusum and Cusum Square tests were used for parameter stability. The details of which are as under;

3.3.6.4.1. Cumulative Sum of Recursive Residuals (CUSUM)

The CUSUM test is based on the cumulative sum of the recursive residuals. This option plots the cumulative sum together with the 5% critical lines. If the

cumulative sum goes outside the two critical lines then the parameters are instable.

The Cusum test is based on the statistic

$W_t = \sum_{r=k+1}^{t} w / s_r$ -------- (24) t=k=+1,,,,,,,,,T

Where *w* is the recursive residual, and *s* is the standard error of the regression fitted to all *T* sample points. If the b vector remains constant from period to period, E[W_t] = 0, but if β changes, $W_t$will tend to diverge from the zero mean value line. The significance of any departure from the zero line is assessed by reference to a pair of 5% significance lines, the distance between which increases with *t*. The 5% significance lines are found by connecting the points

$[k \pm 0.948(T-K)^{1/2}]$ and [T, $\pm 0.948(T-K)^{1/2}$]

Movement of W_tOutside the critical lines are suggestive of coefficient instability.

3.3.6.4.2. Cumulative Sum of Recursive Residuals Squares

This test is also used for checking the stability of the model.

The Cusum of squares test is based on the test statistic

$S_t = \sum_{r=k+1}^{t} w_r^2 / \sum_{r=k+1}^{t} w_r^2$ ---------- (25)

The expected value of *S* under the hypothesis of parameter constancy is

$[E/S_t]$ = (t-k)/ (T-k) ---------- (26)

Which goes from zero at *t*=*k* to unity at *t*=*T*. The significance of the departure of *S* from its expected value is assessed by reference to a pair of parallel straight lines around the expected value.

The Cusum square test provides a plot of S_t against *t* and the pair of 5% critical lines, and movement outside the critical lines is suggestive of parameter or variance instability.

3.4. Summary

This chapter reviewed the sources of all variables used in this study.

To ascertain the stationarity of time series data ADF and PP tests have been used. For lag length AIC is used.

For examining the relationship and analyzing the impact of education and health on GDP per capita linear regression line is used.

For the long run relationship between education, health and economic growth two methods of cointegration are used i.e. Engle Granger two step procedures and ARDL are used. The whole procedure of both tests has been given in detail.

For short run analysis ECM is used. ECM has been also discussed in detail.

For checking Autocorrelation, heteroscedasticity, ARCH and stability of ARDL and ECM models, different test were conducted and also these tests are discussed in detail.

All the variables there sources and definition are given in Table 3.1.

Table 3.1
Definition and sources of variables

S.No	Variables	Sources	Definition of variables
1.	Y	WDI , SBP	The percentage annual growth rate of GDP per capita
2.	ExE	WDI, SBP	Public Expenditure on Education
3.	ExH	WDI, SBP	Public Expenditure on Health
4.	IMR	WDI, SBP	Infant Mortality Rate
5.	LE	WDI, SBP	Life Expectancy
6.	EnP	WDI, SBP	Enrollment at Primary level
7.	EnS	WDI, SBP	Enrollment at Secondary level
8.	EnH	WDI, SBP	Enrollment at tertiary level

Source: World Development Indicator and State Bank of Pakistan

CHAPTER 4

The Retrospective Study of Education Sector

4.1. Introduction

In this chapter various steps taken by the government for the uplift of Education sector during 1970-2010 have been discussed in detail. Different educational policies have been presented by different governments. These policies are New Education Policy 1970, Education Policy 1972-1980, National Education Policy 1979, National Education Policy 1992, National Education Policy 1998, and National Education Policy 2009.

To make Education system consonant with the ideological, social, economic and national needs of an independent sovereign state. For this purpose the mechanism of five year plans was used to achieve these goals. These plans have played an important role in educational development since independence. These plans are designed to get some fundamental objectives i.e. raising of national income, improving the balance of payment, increase the job opportunities and making progress in providing social services, like housing, education, health and social welfare. These plans are discussed in detail over the study period. These five year plans are 4th five year plan (1970-78), 5th five year plan (1978-83). 6th five year plan (1983-88), 7th five year plan (1988-93) and 8th five year plan (1993-98).

4.2. Historical Background

On 14th August 1947, Pakistan became an independent state, with two separate Muslims majority wings, one situated in the eastern and the other in the northwestern region of South Asia. These states comprised the provinces of Baluchistan, East Bengal the North West Frontier Province (Now Khyber PaktunKhwa), West Punjab and Sindh.

After partition the new country faced several problems of them education and health was the most important and especially the education, as the new country had to face the world competition, and this was only possible with the healthier

educated and skilled manpower. As education and health is the basic thing for the development of skilled manpower.

Keeping this in mind various governments during the last 60 years have framed various educational policies from time to time, stressing the significance of education. We start here with the different education policies over the study period (1970-2010).

4.3. Education Policies over the Study Period

After partition the nation faced a tough competition with the rest of the world, and the future of the nation depends upon how well it would meet this competition with the knowledge and skills of its own manpower. Education the fundamental and important needs for the development of manpower. Without educated manpower no country can attain socioeconomic development in this world. Keeping these needs in mind Government of Pakistan has framed different education policies, stressing the importance of education and suggesting ways of giving good education to its citizens.

Over the study period, five education policies were presented by the Government of Pakistan, they are as under,

4.3.1. New Education Policy 1970

Education policy 1970 was announced by the government on 26th March 1970. This policy considered educational development as an active process, which implied an evolutionary exercise and periodic appraisals of policies and programmes on the part of the state, the community and all others concerned with it.

New Education Policy 1970 suggested the following five major areas of reform:

4.3.1.1. Areas of Reforms

These reforms are as under:

(i) "Education has a positive role in the preservation and the inculcation of Islamic values as an instrument of national unity and progress".

(ii) "All the programmes of education sector would be reoriented in the light of the economic needs of the society".

(iii) "The role of education as a mean of social change and development".

(iv) "The utmost significance of quality in education"

(v) "Decentralization of educational administration, to ensure academic freedom and administrative and financial autonomy".

Education Policy 1970 puts greater emphasis on primary enrollment up to class 5th, by 1980. It also proposed decentralization of the administration of educational institutions, in order to allow community participation. For this purpose it was proposed that the provinces should set up autonomous district school authorities, autonomous zonal college authorities and also education services boards.

4.3.1.2. Major Recommendations

The major recommendations of the education policy were as under:

i) "Postgraduate teaching and research should be greatly strengthened, and PhD and other research programmes institutions also".

ii) "A National Research Fellowships Scheme was instituted. To finance the research by individual scholars, or team of scholars, was created".

iii) "An immediate reorganization of courses of study and curricula would be undertaken".

iv) "Modern techniques of language teaching would be adopted in language departments. The central government should establish two National Institutes of Modern Languages".

v) "New universities should be established with careful planning".

vi) "To meet the growing needs of higher education, new colleges would be established with emphasis on science education, and extend the facilities of college education to all regions".

vii) "Universities should continue to affiliate colleges, and colleges with track of quality education should increasingly become self-governing institutions".

viii) "As an important measure towards raising the quality of education, the salary-scales and service conditions for the teaching staff would be improved".

ix) "A system of sabbatical leave should be introduced for teachers".

x) "The efficiency and discipline rules of the university teachers should be reviewed, and clauses, if any, empowering action, eliminated".

xi) "Necessary legislation should be enacted by the Provincial Governments for (a) the restoration of the Senate, (b) introduction of the elective principal in the various bodies of the universities, (c) repeal of provisions for the withdrawal of degrees, and (d) development of universities as centers of learning and nurseries of values and ideals, in an atmosphere of academic freedom".

The total allocation for New Education Policy 1970 was 892 cores the details are as under,

Table # 4.1
4th Plan Break-Up for New Education Policy 1970

	Recurring	Capital	Total
East Pakistan	232	195	427
West Pakistan	305	115	420
Centre	15	30	45
Total	552	340	892

Source: *New Education Policy 1970*

The announcements of the new education policy 1970 coincide with political instability in the country. Political disruption did not even allow the 4th five year plan to be implemented, and the policy was abandoned.

4.3.2. The Education Policy 1972-1980

The Education Policy 1972-1980 made recommendations similar to the New Education Policy 1970, but its keynote was the nationalization of the private institutions. The implementation of the nationalization program put serves to constrain on the national exchequer. The non-development expenditure rose by

six times. The Education Policy 1972-1980 was formulated with the aim of achieving the following objectives:

4.3.2.1. Objectives of Education Policy 1972-1980

Following are the objectives of Education Policy 1972-80,

i) "Ensuring the preservation, promotion and practice of the basic ideology of Pakistan, and making it a code of individual and national life".

ii) "Building up national unity, by promoting social and cultural harmony".

iii) "Mobilizing the youth for the leadership roles, through involvement in programmes of social services".

iv) "Eliminating illiteracy within the shortest possible time, through universalization of elementary and massive adult education programme".

v) "For equalizing access to education, women and adults will be provided with special facilities".

vi) "Designing curricula relevant to the nation's changing social and economic needs".

vii) "Providing a comprehensive programme of studies through the integration of general and technical education".

viii) "Academic freedom and due autonomy to educational institutions would be provided within the framework of national objectives and requirements".

ix) "The welfare, dignity and sense of responsibility of teachers and students would be promoted".

x) "At Multan, Swat and Sukkur new universities would be established".

xi) "Raise the Agriculture College Tandojam to the status of a university".

xii) "Add new faculties to the Agriculture University Faisalabad".

xiii) “Add a Medical College to the University of Balochistan”.

xiv) “Establish a University Grants Commission, so that it can act as a buffer between government and university administration”.

xv) “Replace ill-framed university ordnances by progressive legislation to democratize the working of universities”.

xvi) “Establish Area Study Centers for research in general universities”.

xvii) “Add science education stream in degree colleges”.

xviii) “Set up professional councils to lay down minimum standards in professional fields”.

xix) “Institute a programme of National Professorships, so that highly qualified scholars and scientists may continue as a teacher and research worker”.

xx) “Institute of National Research Fellowships at Universities and other appropriate institutions be financially supported, so that they are able to provide physical and other facilities for the work of outstanding scholars”.

The Education Policy 1972-80 was implemented to a certain extent. The recommendation regarding the nationalization of privately managed institutions was implemented. Similarly, during 1971-78, there were expansions of enrollments at all levels.

4.3.3. National Education Policy 1979

When the government changed in 1977, a National Educational Conference was convened by the President in October 1977; the purpose was to set fresh recommendation for a new education policy. The new education policy was presented in February 1979.

The major aims of the policy were harmonization of education in Pakistan with the concepts of Islam and the ideology of Pakistan, and creating awareness that Pakistan is also a part of Universal Muslim Ummah, inoculation of character in accordance with Quran and Sunnah. Providing all the citizens with equal

opportunities for culture and religious development, development of creative and innovative faculties of people, fostering discipline and promotion of scientific and technological education needed to uplift of the country. It was decided that national language would be used as the medium of instruction.

The proposed recommendations were as:

4.3.3.1. Recommendation of Education Policy 1979

Following is the recommendation of Education Policy 1979,

I) "Curricular revision with a view to reorganizing the entire content around Islamic thought".

II) "Possibility of merging the traditional Madrassa education with modern education".

III) "Use of Urdu as medium of instructions".

iv) "Training of productive work".

v) "Mobilization of community resources for educational purposes, effective participation of community illiteracy/education programs".

vi) "Linking of scientific and technical education with production".

vii) "More emphasis on quality improvement and consolidation and opening new institutions only where demand is responsible".

viii) "Separate educational institutions for female students' up to highest level".

ix) Proposed change in the educational structure from 4-tier system to the 3-tier system, as result degree colleges would include classes' xiii, xiv, xv, and xvi a four year course as a part of higher education.

x) For a degree college minimum strength would be fixed

xi) In a town where there are more than one college offering the instruction in science disciplines, teaching of science subjects would be consolidated.

xii) Co-curricular activities would be encouraged.

xiii) Guidance and counseling services would be organized in colleges.

xiv) Adequate educational and scientific equipment and laboratory facilities would be provided to a maximum number of colleges.

xv) Five more Centers of Excellence in important disciplines would be established, and already existing centers would be further developed.

xvi) In some universities certain departments possessing the required research potential would be developed as centers of Advanced Studies for doctoral and post-doctoral programmes.

xvii) In some selected girls' colleges in provinces post-graduate classes would be introduced.

xviii) The University Grants Commission would review the curriculum at tertiary level, and changes would be introduced to link it with the future needs of the country.

xix) The libraries of the universities would be strengthened.

xx) For admission to higher education, a national testing system would be developed and launched.

The schemes of the National Education Policy 1979 were assessed and were worked-out for financial implications. These implications were estimated within the basic framework of the 5th five year plan, total development expenditure was 10281 million and non-developmental expenditure was 18617 million so a total of 28898 million.

To get the desired ideological direction for education in national education policy, it was estimated that an additional provision of Rs. 256 million would be required apart from the 5th five year plan allocations.

Implementation of the policy started in 1979. The medium of instruction was switched over to Urdu in government schools. The private sector was encouraged to open schools and policy of nationalization was reversed.

4.3.4. National Education Policy 1992-2002

Since the independence participation rate at various levels of education has been very low. Various policies had been formulated for the uplift of education in the country. These reforms appeared in various areas of education, economic and social institutions. However due to limited financial resources, low priority

to education and the pressures of population have never allowed a full expression of the desired change, and as a result education has not been able to assure a good life for the society as a whole.

National Education Policy 1992 was introduced in late 1992. The basic purpose of the policy was to reorganize the existing educational system on modern lines. This would be attained by universalizing primary education, improving the quality of education and unchecking energies for participation in the nation building process. The main goal was also for a higher participation of the private sector in educational development.

4.3.4.1. Main Recommendations of Education Policy 1992

Following are the main recommendations of Education Policy 1992;

i) "Forming the society as determined by the teaching of Islam".
ii) "100% participation of children at primary level by the year 2002".
iii) "By the year 2002 literacy ratio will be 70%".
iv) "To improve the quality of education the role of teachers will be reassured in the teaching process".
v) "Use of community for the promotion of basic education in the country".
vi) "Intensifying vocationalization of general education and introducing a new stream of technical education in middle and high schools, inviting the private sector for participation in educational programs".
vii) "For the enforcement of discipline and to de-politicization of campus procedures will be initiated".
viii) "National Testing Service will devise the procedure for the merit based admission".
ix) "In colleges and universities all science and engineering laboratories will be equipped with sophisticated equipment and trained manpower".
x) "For research books and journals more funds will be allocated".

xi) “Linkages of good university departments with an international institution will be established”.

xii) “Research centers on community related problems will be established in universities”.

xiii) “The restriction of No Objection Certificate (NOC) of teachers to participate in international conference will be lifted”.

xiv) “Provinces will encourage for setting up institutes of higher science and technology”.

xv) “For the better management of universities, University Act will be amended”.

xvi) “In each province a separate Funding Council for Colleges (FCC) will be set up”.

xvii) “Competitive grants will be provided to institutions demonstrating a high level of efficiency”.

Due to political instability, lack of resources and lack of the commitment of the policy makers, this policy could not achieve the desire targets.

Following are the main achievements of this policy,

4.3.4.2. Achievements of Education Policy 1992

i) For the promotion of primary education School Management Committee were established.

ii) In all provinces mixed primary school was introduced.

iii) To attract female population towards the teaching profession the qualifications of the teachers have been lowered.

iv) To enhance the literacy rate in selected areas of Pakistan different literacy programs was launched.

v) For the best primary teacher at national level competition were held to give awards to best teachers.

vi) And the historic decision by the Supreme Court of Pakistan by banning the students' unions in the colleges and in universities.

4.3.5. Education Policy 1998

Continuing the process of education policies in the country, education policy 1998 makes several rises. “First, in the 21st Century it visualizes Pakistan as an Ideological State. It declares, Pakistan is not a secular country. Ideology of Islam forms the genesis of the State of Pakistan. The country cannot survive and advance without placing the entire system of education on a sound Islamic foundation. It goes on to say, the only justification of our existence is our total commitment to Islam as our sole identity. Second, education is perceived as an instrument to build a sound Islamic society. Third, Islam and Islamic values should not be part of Islamic study alone but also all other disciplines. Finally, recognizing the centrality of Islam the policy envisages Pakistan as an ideological State”.

Continuing in the spirit of education policy1992, education policy 1998 recognized the pitfalls of primary & secondary education system. The policy proposed a few new initiatives they are as under;

4.3.5.1. New Initiatives of Education Policy 1998

(i) “The role of National Education Testing Services (NETS) will be expanded”.

(ii) In each district education authorities will be established and will regulate the work of education foundation.

(iii) “To improve the dismal dropout rate and enrollment at primary level the policy envisaged the promulgation of the Compulsory Primary Education Act by 2004-05”.

(iv) “To restructure and expand primary & secondary education, International donor agencies will give technical and financial support”.

(v) “Proposed Islamic law courses will be offered at International Islamic University Islamabad and Bahawalpur Islamia University”.

(vi) “It was proposed that the private sector can open universities in health & science sectors”.

(vii) "This policy proposed to institute a federal law to ensure quality research in sciences, law, arts and social sciences at universities and other research institutes".

(viii) It was also observed "By 2010 in most universities qualified faculty will retire therefore serious need to plan for acquiring qualified faculty".

(ix) Islamiyat made compulsory from class 1st to Graduation.

(x) "Holly Quran along with translation would be taught from class 6th to class 12th. From Class 7th, Holly Quran, Islamiyat and Arabic introduced as an integrated compulsory subject. English will be the medium of instructions".

(xi) "Functional literacy and income generation skills will be provided to rural women of 15 to 25 age group and basic educational facilities will be provided to working children".

(xii) By the year 2010, the existing inequalities in basic education will be reduced to half.

(xiii) Double shifts will be introduced in school of basic education.

This policy is determined to improve and enhance the quality and standard of primary school female teachers. It assumed that female teachers could increase girl child enrollment rate. Therefore it proposed that the newly established schools would have more female teachers.

This policy also expands the provisions of denationalization of educational institutions. To improve the literacy rate in the country, the policy introduces a massive non-formal education program to support formal education.

This policy also proposed building for libraries and other facilities for research on campuses. The policy continued its stress on re-orientation of teacher education. For the recruitment of teachers an Education Public Service Commission would be established was also proposed. All master level and bachelor level education program's curriculum would be revised.

4.3.5.2. Targets of Education Policy 1998

Some targets were also set for the Education Policy 1998 they are as under,

(i) "Illiteracy will be eradicated through formal and informal means of basic education".

(ii) "The current literacy rate will be raised to 55% by 2003 and by 2010 it will be 70%".

(iii) "By the year 2002-03, gross primary enrollment will be 90%".

(iv) "In a phased manner, the Compulsory Primary Education Act will be promulgated and enforced".

(v) "At each district level, one model secondary school will be set up".

(vi) "Private investment in the education sector will be encouraged".

(vii) "For establishing educational institutions in the private sector in the rural areas through Education Foundation, matching grants shall be provided".

4.3.6. Education Policy 2009

Education is the most important investment for human and economic development of a country. Traditions, culture and faith all reflect upon the education system and at the same time are also affected by them. The element of continuity and change remains perpetual and it is up to the society to determine its pace and direction. The societal, political and governmental structures also affect the effectiveness of the education system. An education policy cannot be prepared in isolation of these realities. The Education Policy 2009, therefore, identifies some of the principal challenges and proposes policy options, within the context of the education system. Cultural values of the majority of Pakistanis are derived from Islam. Since an education system reflects and strengthens social, cultural and moral values, therefore, Pakistan's educational interventions have to be based on the core values of religion and faith.

4.3.6.1. Features of Education Policy 2009

Main features of Education Policy 2009 are as;

A. Policy Actions to improve Access and Equity in Education

i) "By 2015 Dakar "Education for All" and Millennium Development Goals relating to education shall be achieved".

ii) "Introducing early childhood education (3-5 years)".

iii) "Age limit for primary will be 6-10 years and free education includes all education related costs".

iv) "Equity in education i.e. gender, geographical urban-rural areas shall be promoted".

v) "For recruitment of female teachers, maximum age limit shall be waved off".

vi) "For expanding basic school facilities plans will be prepared".

vii) "Class eleven and twelve will be merged into school education".

viii) "It shall be a high priority to reduce the dropout rates at all levels".

ix) "For poor student government will establish "Apna Ghar" residential schools in each province and will provide quality education free of cost".

x) "A unique ID will be allotted to every child for admission to grade 1, and will continue throughout his or her academic career.

xi) "Technical and vocational education will be extend and ensure at all districts".

xii) "Enrollment at tertiary level will be raised up to10% by 2015".

B. Policy Actions to Improve Governance and Management in Education

i) "At all levels planning management and implementation capacity shall be enhanced in education sector".

ii) "Sector planning in education shall be promoted".

iii) "A system will develop between development partners and government for donor harmonization and aid effectiveness".

iv) "Fragmented governance of education at federal and provincial levels including literacy shall be managed under one organization."

v) "Separate academic and educational management cadres with specified training and qualification requirements shall be introduced".

vi) "For encouraging public-private partnership, the government shall take steps to bring harmony through common standard quality and regulatory regimes".

vii) "For public and private educational institutions a common curriculum framework will be applied".

viii) "Deani Madaris shall be mainstreamed by introducing contemporary studies alongside the curricula of Deani Madaris".

ix) "Minimum National standards for educational inputs, process and outcomes shall be established".

x) "Government will increase the budget allocation by 7% of GDP by 2015".

C. Policy Action to Improve Quality and Relevance of Education.

i) "For elementary level teaching educational requirement will be bachelor's degree with a Bachelor of Education, while PTC and CT shall be phased out through encouraging the present set of teachers to improve their qualifications".

ii) "Standard and institutions will be setup for teacher's training, arrangement, accreditation and certificate procedures".

iii) "The government shall take steps to ensure that teacher recruitment, professional development, promotion and posting are based on merit alone".

iv) "Curriculum development shall be objective driven and outcome-based".

v) "Professional councils shall be involved for the relevant curriculum development".

vi) "Use of IT in education shall be promoted".

vii) "Curriculum Wing of Ministry of education and provincial textbook boards shall ensure the elimination of all types of gender biases from textbooks".

viii) "Federal and provincial governments shall increase investments in school libraries".

ix) "Examinations systems shall be standardized to reduce differentials across students appearing in different boards of examination".

x) "Basic standards for school facilities including playground shall be established by 2012 to improve school environment".

xi) "To create an order for excellence in the county a "National Merit Program" shall be introduced to award bright students".

xii) "Sports activities shall be organized at the secondary, higher secondary, college and university levels, and a special department will be established in the Ministry of Education".

xiii) "National Education Policy 2009 puts special emphasis on skill development and provision of quality technical and vocational education".

xiv) "Technical and Vocational education curriculum will be revised to meet new challenges. The private sector will be encouraged to participate in promotion of skill development".

xv) "Investment in tertiary education shall be gradually increased to 20% of the education budget".

4.4. Five Years Plans

Since independence, in Pakistan various governments have formulated different policies and plans for the uplift of the whole economy, to cope with social economic and national needs of an independent sovereign state. To achieve these goals the mechanism of five year plans was used. These five year plans were designed to achieve some basic objectives such as raising national income, increasing and creating employment opportunities, improving the

balance of payment and providing social services like education and health etc...

Here we discuss the portions of these plans which deal with education and health over the study period (1970-2010).

4.4.1. 4th Five Year Plan (1972-78)

After the completion of the 3rd five years plan it was felt greatly that to change the qualitative aspects of development in Pakistan a new look is necessary. The country had gone through two decades of development. At the beginning of the 4th Plan a decision was taken to reset the all priorities and measures were adopted to reflect these priorities.

The main objectives of the plan were split out in the document "Socio-Economic Objectives of the 4th Five Year Plan", and this was approved by National Economic Council in 1968. The main objectives of the plan were as,

4.4.1.1. Main Objectives of 4th Plan

a) To maintain the speed of development in the country, and secure the maximum and most efficient utilization of its material and human resources.
b) To reduce the inter-regional disparity.
c) To make the country self-sufficient in the most of the fields.

In 4th Plan a development program of Rs. 75000 million was proposed. The main target of the plan was to attain an annual GNP growth rate of 6.5 % and this will help in increasing the per capita income from Rs, 567 in 1969-70 to Rs. 675 in 1974-75. Out of the total development program public sector share was 65% and private sector share was 35%.

The development plans of Pakistan have increasingly been based on the concept that education is a vital national investment and a major determinant of economic progress. The priority accorded to education in the drafting of plans, however, has not always been reflected in the implementation of plans. Required funds have been denied to the education and training sector because

of pressure for resources in other economic sectors. This was particularly the case in the 3rd Plan, when a combination of adverse circumstances made it necessary at the very inception of the plan to divert investment from long-gestation to quick yielding programs. The result has been that just when our economy, having completed its preliminary stage of industrialization, was entering a more sophisticated stage and making greater demands on its trained manpower, the country found itself faced with a serious imbalance between manpower needs and education output. Large scale unemployment notwithstanding, there are shortages of skilled manpower in fields that are critical for development. The educational base remains narrow, since only 18% of the population can be regarded as literate. The percentage of dropouts and failures continue to be wastefully high.

In 4th plan the main strategy for education was to check the unrestricted growth of the traditional education and to make the system more functional with respect to the needs of the country. It was decided that a system would be created for education and training that would be reflected in economically sensible distribution of resources among its component parts.

From the 1st five year plan for the 4th plan, all plans had recognized the importance of education and considered education as a vital element for development and a major determinant of economic progress. In this matter 4th plan goes ahead by accepting the reality that is not only necessary to spend more money on educational training and research, but to spend it more effectively.

Primary education is at present available to about half of the nation's children and the number of illiterate persons is increasing every year and this illiteracy hampers economic and social progress. Resources allocated to education services during the previous plans were not sufficient for the primary education, so there is an intensification of efforts to obtain universal retention in the primary institutions. There will also be an intensification of efforts that

lie outside the primary school system. For the training of employees the corporation of all large employers in both the public and private sectors will be obtained, and this will increase functional literacy.

There is universal agreement about the increasing importance of technical and vocational education. The 4th plan has incorporated the major shift towards technical and vocational training. Most of the technical programs have so far suffered from the lack of qualified teaching staff and foreign exchange for the purchase of equipment and books. So it was considered essential that within sub-sector of technical and vocational education highest priority should be given to a substantial improvement in the training of teacher (including teachers of agriculture and of the arts).

The strategy for secondary education should be governed by the needs of trained manpower. In the past too much emphasis in the education was placed on preparing people for desk work occupations in the services sectors of the economy and to tittle on preparing people for agriculture and manufacturing sectors. The need for functional bias during the secondary level will be met in part through integrating pre-vocational training in the general education system up to the middle level.

Expansion in the field of higher education should be guided and planned broadly in relation to manpower needs and employment opportunities. While the paramount importance of quality in higher education is well recognized and large investment in this area of reform, necessary arrangement would be adopted for arresting unregulated expansion.

The government quite aware of the deficiencies of the educational system announced the new education policy in March 1972, a statement of national goals indicating the directions in which the county must go forward. In 4th plan educational sector program was designed within the broad framework of the new education policy. Its main objective was as,

4.4.1.2. Proposed Developments of the 4th Plan

i) "To create a literate population and educated electorate".

ii) "To make the educational system more functional in terms of its contribution to productivity and economic growth".

iii) "To remove the existing disparity in education services".

iv) "To recognize the vital importance of quality in education".

v) "To make optimum use of the available resources, including physical facilities at all levels".

vi) "To strength and consolidate the program of educational research and development planning".

In 4th plan an allocation of 3665 million for education and training was made. It was 7.5% of the total allocation of Rs. 49000 million in the public sector for development. Following are the details of funds for sub-sectors in education and training,

Table # 4.2
Public Sector Allocation for Education during the 4th Plan

S.No.	Sub-Sector	East Pakistan	West Pakistan	Center	Million Rupees	% of Total
1	Primary education	405	115	27	547	14.6
2	Secondary education a) Middle Stage b) Highest Stage	400 200 200	253 75 178	22 12 10	675 287 388	18.4 7.8 10.6
3	Teacher Education	100	45	---	145	4
4	Technical Education	630	290	---	920	25.2
5	Colleges (General)	220	135	10	365	9.9
6	Universities (General)	170	90	80	340	9.4
7	Scholarships	125	120	21	266	7.3
8	Madrasahs	25	-----	---	25	0.7
9	Social and Cultural Activities including Library Services	50	22	55	127	3.5
10	Special Areas	----	25	15	40	1.1
11	Tribal Areas	----	----	10	10	0.3
12	Adult Education	50	35	----	85	2.3
13	Preparation of Projects etc.	5	5	---	10	0.3
14	Research development	20	15	20	55	1.5
15	Educational TV	--	---	15	15	0.4
16	Statistics and Planning	30	--	--	30	0.8
17	Publicity Scheme	--	---	10	10	0.3
	Total	2230	1150	285	3665	100

Source: *4th Five Year Plan*

Below is the table which gives the details of recurring expenditure on education during 4th plan,

Table # 4.3

Requirement of the Recurring Expenditure during 4th Plan (1970-75)

S.No.	Items	East Pakistan	West Pakistan	Center	Total
1	1969-70 Expenditure extended over the 5-years of 4th plan	1060	1850	110	3020
2	The amount required for the annual increments of the existing staff of educational institutions	90	350	5	445
3	The amount required for additional staff for the New Programs and the introduction of New Pay Scale	1170	850	35	2055
	Total	2320	3050	150	5520

Source: *4th Five Year Plan*

Below is the table of total expenditure of 4th plan for the education sector,

Table # 4.4

Total Expenditure under the 4th Plan (1970-75)

	Developmental Expenditure	Recurring Expenditure	Total (Rs in Millions)
East Pakistan	2,230	2,320	4,550
West Pakistan	1,150	3,050	4,200
Centre	285	150	435
Total	3,665	5,520	9,185

Source: *4th Five Year Plan*

4.4.2. 5th Five Year Plan (1977-83)

The proportion of national resources allocated to education in Pakistan has generally inadequate. The per capita spending on education was Rs. 34 in 1976-77 which is about 1.7% of the GNP. In the other developing countries with the same income level per capita spending on education varies between 2.3 to 3.1% of the GNP. In Pakistan education sector has received inadequate funds despite keen recognition of the importance of education reflected in high targets set by the government in the previous development plans.

During the 5th plan period, an attempt will be made to reverse this process, and proposed to increase the per-capita spending on education from Rs, 34 in 1976-77 to Rs, 66 in 1982-83 and increase of 94%. In the same year, public spending

on education as a percentage of GNP would go up to 2.8%. The plan also proposed re-adjustment in priorities of education by placing special emphasis on the development of primary education. As primary education tends to make the maximum impact on the largest number of people, help to break the crust of tradition and thus provides impetus for modernization. It is essential for removal of disparities among social classes and between rural and urban areas.

Development of education in the past showed that in Pakistan there has been marked bias in favor of higher education, but in this plan it would not be the case. Primary education would be given priority and as a result the plan allocated about one fourth of developmental expenditure to primary education against 11.6% received by it during 1972-77. Along with higher allocation of funds for expansion of primary education, measures would be taken to improve the quality of teaching and to provide better building, furniture and teaching aids. It was expected that the drop-out rate would gradually fall from 50% in 1976-77 to about 37% in 1982-83 and flow of boys would be 90%.

Secondary education will be under the control of board of intermediate and secondary education. Due to the curial role of secondary education, its development will receive special emphasis for qualitative improvement. Enrollment will also be adequately expanded to meet the entrance requirement of institutions of higher education and professional fields and to ensure sufficiently large enrollment in the education stream at the intermediate level to meet the 5^{th} plan requirement of elementary teachers. The enrollment at this stage is projected to increase from 188560 to 238560 during 1977-83.

At the degree and post-graduate levels new institutions will be opened. The main emphasis will be on shifting enrollment from Arts in Science and technical subjects, improving the quality of education, developing the research work in universities and carrying out a systematic and integrated reform of curricula, examination system etc. The total enrollment at degree level and

post-graduate levels in colleges and at the universities of general education would increase from 76000 to 100000.

The strategy for technical education will be that making the training more relevant to actual job requirement of employees and to improve the utilization of technically trained manpower. The diploma level programs of commercial institutions will also be strengthened. Under 5th plan enrollment at the technical colleges commercial institutes' and Engineering colleges/universities would increase from 13500 to 17500, from 4510 to 8250 and from 9000 to 10530, respectively.

A public sector development program of Rs. 163 billion was envisaged in the 5th plan. For education and training Rs. 27.2217 billion were allocated, the details are as given,

Table # 4.5
Estimates of Financial Requirements for Education Sector during 5th Plan
(Sub sector-wise expenditure)

S.No.	Name of the Sub-sector	Development Expenditure	Nondevelopment Expenditure	Total (Rs in Million)
1	Primary	2508	7361.5	9869.5
2	Secondary	3475.7	4422.3	7898
3	Teachers	466	310	776
4	Technical	779	630.1	1409.1
5	College	867.5	1971.7	2839.2
6	University	590	720.2	1310.2
7	Scholarship	576.5	49.6	626.1
8	Non-Formal Education	89.7	6	95.7
9	Production & Supply of Books	42.3	---	42.3
10	Curriculum Development	22.5	2	24.5
11	i) Examination Reforms ii) Guidance & Counseling	6.9 6.9	1 6.5	7.9 71.9
12	Physical Education	425.5	5	430.5
13	Libraries & Archives	34.1	5	39.1
14	Arts & Culture	43	2	45
15	Archeology & Museums	73.7	2	75.7
16	Special Education	34	10	44
17	Miscellaneous	93.6	1400	1494.6
	Sub Total	10134.9	16963.8	27098.7
	Other Divisions			
	Planning Division	35	--	35
	Establishment Division	35	1	36
	Scientific & Technological Research Division	25	1	26
	Religious Affairs Division	25	1	26
	Grand Total	10254.9	16966.8	27221.7

Source: 5th Five Year Plan

4.4.2.1. Plan objectives

The 5th plan places special emphasis on the development of primary education and especially on universal primary education. For this purpose an allocation of 24.5% was made for primary education as against 11.6% during 4th plan. In this plan 33.9% was allocated for secondary education as against 18.4% during the

previous plan. So a large portion of development expenditure was shifted towards primary and secondary education and this shows a significant change in the educational priorities. The aim was the maximum impact on the largest numbers, in order to remove disparities among social classes and between rural and urban areas. The plan emphasis that for real technological progress and especially in agriculture sector was not possible without a literate population. Similarly it also stressed that the objective of qualitative improvement of higher education cannot be realized without providing the educational pyramid with a strong base of elementary education. It was clearly stated that the funds allocated for school covering classes I-X together with the training of teachers, will be not transferable to other educational programs.

4.4.2.2. Physical Targets of the 5th Plan

Following are the physical targets of 5th plan;

1. **Primary Education**
   - i) Open 12000 new schools.
   - ii) 24800 existing schools to be renovated.
   - iii) Increase primary enrollment from 5.61 million to 8.6 million.
   - iv) Induction of 88000 new teachers.
   - v) High priority to expand girls' education at 11% per annum.
2. **Secondary Education**
   - i) Increase enrollment by 1.35 million.
   - ii) This would increase the enrollment of age group 10-14 years to 29% from existing 19%.
3. **Colleges**
   - i) 36 new colleges will be established for boys and 14 for girls.
   - ii) Increase enrollment by 50000, of whom 18000 would be in new streams.
   - iii) 63 intermediate colleges to be raised to degree level, thereby increasing the enrollment from 5596 to 74963.

4. **Universities**

i) Increase enrollment from 2100 to 2500 of 1982-83.

ii) For the water resources center of excellence to be established in university of Engineering and Technology Lahore.

iii) Increase the output of agriculture graduates from 400 to 600.

4.4.3. The 6th Five Year Plan (1983-88)

The 6th plane approaches primary education with the seriousness and urgency. Serious efforts will be made to ensure that gross primary enrollment will increase up to 100% latest by the terminal year of the plan. To accomplish this task a very special effort is required by the government both at federal and provincial level. 6th plan would provide Rs. 7 billion for the development of educational facilities at the primary level. While the main emphasis of the plan will be on primary education it is desirable that the level of universal education will be progressively increased from class V to class VIII then from class VIII to class X and finally to Class XII. The 6th plan also would increase the enrollment at the secondary level at about one million.

Three main issues have a major bearing on the 6th plan education program. One of them is the involvement of local bodies in planning, management and maintenance of education facilities. The second basic issue is of user charges which to all levels of education but especially higher education. The third issue is that of the role of the private sector. The private sector would be allowed to open new schools.

One of the important features of the 6th plan was that, woman's development was given special emphasis. This was the first plan in the history of Pakistan that recognized the significant role of woman in the development process. It was decided that the programs in education, health, population welfare and many other sectors would be especially designed to extend socioeconomic opportunities for woman.

In the 6th plan a sum of Rs. 19850 million has been allocated for the development programs in the sector of education and manpower. It is estimated that implementation and maintenance of the proposed program will involve a recurring expenditure amounting to Rs. 8500 million. The detail is as,

Table # 4.6
6th Plan Allocations for Educations and Manpower,

Sub-Sector	Federal	Punjab	Sind	NWFP	Baluchistan	Total (Rs in Million)
Primary Education	3980	1320	770	740	190	7000
Secondary Education	945	1615	750	570	245	4125
Teacher Education	60	80	80	60	25	305
Technical Education	1155	700	180	180	120	2335
College Education	370	430	240	190	70	1300
University Education	2100	491	431	310	126	2100
Scholarship	395	170	35	60	50	660
Mass Literacy	750	---	---	---	---	750
Dev. Of public library system	300	80	25	30	20	455
Miscellaneous	145	330	40	30	20	455
Programs of Establishment Division	250	---	---	---	---	250
Total	10450	4725	2120	1860	695	19850

Source: *6th Plan*

During the 6th plan education facilities were designed to expand at an accelerated speed. This is clear from the fact that the total expenditure in the public sector would increase from Rs. 6380 million in 1982-83 to Rs. 14700 million in 1987-88 an increase of 130%. In addition to the increased efforts in the public sector special monetary and non- monetary measures will be adapted to motivate and encourage the private sector to fully participate in the development of education facilities in the country. It was also estimated that Rs. 1000 million may be invested during the 6th plan period.

4.4.3.1. Major Physical Targets

The proposed major physical targets for 6th plan are as under,

At a primary level participation rate to increase from 48% in 1982-83 to 75% in 1987-88, for this purpose, 40391 primary schools would be opened including 31800 mosque schools. At secondary level 3807 new middle schools to be built, and 1309 high schools to be opened. Out of this 1073 were to be upgraded middle schools and 236 totally new schools. At higher level two new engineering colleges to be opened, and enrollment of graduate engineers to increase from 12800 in 1982-83 to 15500 in 1987-88. Center of Excellence in water resources and engineering university at Lahore will be strengthened to start MPhil and PhD programmes.

4.4.4. The 7th Five Year Plan (1988-93)

The 7th plan was prepared in the light of the experience gained from the implementation of the 6th plan and within the socioeconomic framework. The plan aimed to improve the quality of life and raise the living standard of the majority of citizens in the country. It proposed to achieve these objectives through the widespread provision of public services and especially education and health to all sections of society. For this purpose, public sector allocation was raised from 15% during the 6th plan to 22% of the total public sector development program during the 7th plan. For the 7th plan total development program of Rs. 642 billion was envisaged. By this the public sector development outlay was proposed to be of Rs. 350 billion, and private investment of Rs. 292 billion.

During the 7th plan as far as education was concerned, the major objective was to improve the level of literacy and education and quality of education in the country and substantially increase the technical and vocational education facilities. The main objectives of the 7th plan for the sector of education and training were defined as follows,

4.4.4.1. Main Objectives of 7th Plan

Following are the main objectives;

i) "Broaden the resource base for education".

ii) "Universalize access to primary education".

iii) "Substantially improve technical and vocational training".

iv) "To improve quality of education at all levels".

The basic approach was to increase the literacy rate. It was estimated that the literacy rate would be increased to about 40% by the end of the plan (1992-93). In the 7th plan the allocation of Rs. 23.11 billion was made for education in the public sector. It is 3.6% of the total development program and 6.6% of the public sector development allocations. The details are as under,

Table # 4.7
Public sector Development Expenditure Allocation in Education during 7th plan (1988-93)

S.No.	Sub-sector	Million Rupees	Percentage
1	Primary Education	10128	43.8
2	Secondary Education	6539	28.3
3	Teacher Education	287	1.3
4	Technical Education	2000	8.6
5	College Education	615	2.7
6	Scholarships	760	3.3
7	Literacy & Mass Education	300	1.3
8	University Education	2000	8.6
9	Library System	181	8
10	Miscellaneous Programs	150	.65
11	Other Divisions	150	.65
	Total	23110	100

Source: *7th Five Year Plan*

Some physical targets were also set which are to be achieved during the plan they are as under;

4.4.4.2. Major targets to be achieved during the 7th Plan

At primary level, the total allocation for primary education would be increased up to 44% of the total education outlay. The participation rate of children in primary schools to increase from 64% to 80% by the end of 1992-93. New 34532 primary schools would be opened and also 20000 mosque schools.

At the middle level, the participation rate for middle schools to increase from 42% from existing 30%. 3000 new middle schools would be opened and enrollment in the middle stage to increase by 1.4 million. At secondary level, 120 new high schools to be constructed, the participation rate of high school stage to increase from 17% to 24%. At higher education level, enrollment in engineering institutions has to be raised from 4000 to 5000. Engineering universities would offer only post-graduate classes. Undergraduate classes to be offered in engineering colleges only. The private sector is to be encouraged to establish universities in new and emerging fields.

4.4.5. The 8th Five Year Plan (1993-98)

Education is a key element of development and a basic right of every individual. Considerable expansion of educational facilities took place in the country since independence. Despite these considerable expansions and achievements, more remains to be accomplished.

The 8th plan was launched with an outlay of Rs. 1700 billion with the overall objectives to enhance substantially the socioeconomic well-being of the people. One of the important features that characterize the plan is the recognition of the fact that consolidation and rehabilitation of the physical and social infrastructure is as important as new investment.

The key economic and social targets of the plan include, increasing the gross domestic product by 40% and per-capita income by 22% increasing the literacy rate from 35% to 48% and attaining universal primary education enrollment in the first year class for both sexes.

The Social Action Program (SAP) formed a vital component of the 8th plan and was launched in 1992-93. The special purpose of the SAP was to promote productivity reduce poverty and encourage healthier and better educational facilities. The SAP aimed at the provision of basic social service. The education and training sector was to be supported by the SAP, and basic

education was one of the five major components of the SAP, and especially greater emphasis on primary education.

In 8th Plan 69.031 billion was allocated for public sector education and training this also includes 39.319 billion for SAP. It was also estimated that Rs. 159 billion would be required for the recurring expenditure for the 8th plan period.

Following are the details of public sector allocation for Education and SAP,

Table # 4.8
Public Sector Development Allocation for Education and Training during 8th Plan

Sub-sector	Allocation	SAP component
Primary Education	32669	32669
Secondary Education	16521	-----
Teacher Education	3360	234
Technical Education	2447	----
College Education	2507	----
Scholarship	1400	----
University Education	4100	----
Literacy And Mass Education	1750	1750
Literacy services and Museum	200	-----
Miscellaneous	677	-----
Education Foundation	3200	2560
Establishment Division	200	----
Total (Rupees in Million)	69031	39319

Source: 8th Five Year Plan

Some physical targets were also set which will be achieved during the 8th plan; the details are as under;

4.4.5.1. The Physical Targets of the 8th Plan

1) **Primary Education**

(i) Universalizing access to primary education for all children of 5-9 age groups.

(ii) Legislation for compulsory primary schooling for all children who has a school in reachable distance.

(iii) Enrollment at primary level to increase from 12.4 million to 17.96 million.

(iv) 4300 mosque schools to be opened.

(v) Convert 1700 mosque schools to primary schools.

(vi) Open 30,000 new primary schools.

(vii) Improve physical infrastructure and teachers of primary schools.

2) **Secondary Education**

i) Participation rate for boys be raised from 50% to 55, and for girls from 26% to 30%.

(ii) Two million additional seats in classes VI to X.

3) **Technical Education**

(i) 30 mono-technics and poly-technics to be established.

(ii) 100 new vocational institutions be established.

4) **Higher Education**

(i) University of Engineering and Technology "Taxila" be upgraded to a model university.

(ii) Engineering graduates' capacity, be increased from 4500 to 5500.

(iii) Degree level education to be of 3 years duration.

4.4.6. Education Sector Reforms (2001-05)

Education Sector Reforms (ESR) was launched in 2002. It greatly emphasized to meet the challenges confronted at all sectors of education. It reveals the national education agenda. It has put a systematic attention to different areas of education such as rehabilitation of physical infrastructure support to formal and non-formal delivery system, private sector, mainstreaming of religious Madrassas, literacy, teacher training, assessment and examination reforms, research and research incentives.

ESR recognizes that the goals of access, equity, efficiency and quality can only be achieved by giving full support and space to civil society and private sector.

4.4.6.1. Mission Statement

"Developing human resources in Pakistan as pre-requisite for global peace, progress and prosperity".

4.4.6.2. The Vision

The vision of ESR is as,

Quality education enabling all citizens to reach their maximum potential. Produce responsible, enlightened and skilled citizens. Integrate Pakistan into the global framework of human centered economic development.

4.4.6.3. Strategies

Following are the strategies of ESR;

i) "Sector-wise reforms based on efficiency and equity".
ii) "Political will, education as the anchor for economic revival strategy".
iii) "Poverty reduction strategic program, education is a crucial level for entitlement".
iv) "Resource mobilization from all channels"
v) "District based education planning and implementation under the devolution plan".
vi) "Public-private partnership and community participation".
vii) "Education For All" plan and ordinance for compulsory primary education".
viii) "Outcome based planning, budgeting and auditing".

4.4.6.4. Policy Statement

Following is the policy statement of Education Sector Reforms,

i) "Education For All (EFA) is vital for socioeconomic development in Pakistan".
ii) "Service delivery shall be improved through quality assurance to attract additional enrollments".
iii) "Technical & professional education shall be strengthened".

iv) "College and higher education shall be strengthened and linked to national and international research and training institutions".

v) "Decentralization in accordance with the Devolution Plan is the implementation framework of ESR".

vi) "Governance of educational institutions shall be strengthened and Public Private Partnership shall be introduced to improve management, financing, and planning at institutional level".

vii) "The public expenditure on education shall be increased from existing average level of 2% to 3% of GNP".

viii) "Cost shared education shall be introduced in a selected manner and the receipts shall be retained and utilized by the public sector institutions to bridge the gap between income and expenditure".

ix) "Performance based audit shall be introduced to maintain transparency and accountability in education system".

4.4.6.5. Objectives

Following are the objectives of ESR;

i) "Universalization of primary education and adult literacy".

ii) "Mainstreaming Madaris for diversifying employment opportunities for their graduates"

iii) "Improvement in the quality of education through better teachers, upgraded training options, curriculum textbook reforms and competency based examination system".

iv) "Introducing a third stream of gender and area specific technical and vocational education at the secondary level with innovative approaches for students counseling".

4.4.6.6. Targets of Education Sector Reforms

Following are the targets of ESR the period 2001-2005,

Table # 4.9
Education Sector Reforms Targets

S.No.	Sub-Sector	Bench mark 2001	Target 2005
1	Literacy	49%	60%
2	Gross Primary Enrollment	83%	100%
3	Net Primary Enrollment	66%	76%
4	Middle School Enrollment	47.5%	55%
5	Secondary School Enrolment	29.5%	40%
6	Technical Streams Schools	100	1100
7	Polytechnics/Mono-Technics	77	160
8	Madaris Mainstreaming	148	8000
9	Public-Private Partnership	200	2600
10	Higher Education Enrollment	2.6	05%
11	Quality Assurance	Equivalence of all Sub-Sectors to International Levels.	

Source: Education Sector Reforms 2001-05

4.4.6.7. ESR's Financial Requirements for 2001-05

Rs. 55.5 billion package was prepared for the year 2001-04 for ESR. But to accommodate President's programs, for this purpose program has been extended to 2005 and also budget was increased to 100 billion. The details are as under,

Table # 4.10
Financial Requirements for ESR during 2001-05

S.No	Programs	2001-02	2002-03	2003-04	2004-05	Total	%
1	Elementary Education	4	9	10	11	34	34
2	Literacy Campaign	0.8	2	2.5	3	8.3	8.3
3	Mainstreaming Madaris	0	5	5	4	14	14
4	Secondary Education	1	3	3	3	10	10
5	Technical Education	0	3	5	7	15	15
6	College/higher Education	1	3	3	3	10	10
7	Quality Assurance	1	2	2	3	8	8
8	Public-Private Partnership	0.1	0.2	0.2	0.2	0.7	0.7
	Total	7.9	27.2	30.7	34.2	100	100

Source: *Education Sector Reforms 2001-05*

4.4.6.8. Achievement of ESR

Following are the achievements of ESR;

i) "Compulsory Primary Education Act/ordinance: promulgated in Punjab, Sindh, North West Frontier Province & Islam Abad Capital Tertiary".

ii) "Incentives for Universal Primary Education were introduced".

iii) "Education For All" Media Plan launched on September 8th 2002".

iv) "10,000 schools rehabilitated under ESR".

v) "500 Early Childhood Education Centers established in government schools".

vi) "Parents Teacher Association set up in all government schools".

vii) For controlling absenteeism accountability system was introduced.

viii) To narrow the gender gap mixed primary schools were started.

ix) "Pakistan eligible for Fast Track Financing up to 2015 by G-8 provided it can harmonize its data, costing estimates in ESR, EFA, PRSP, and Perspective Plan".

x) "South Asia EFA Forum was established. Pakistan coordinating/leading the forum on themes of Financing & Quality in member countries".

xi) "Establishment of the National Commission for Human Development (NCHD), facilitated by the Ministry of Education to promote district based integrated literacy initiative in 16 districts".

xii) "District EFA Planning initiated in 73 districts of Punjab, Sindh, Baluchistan & Azad Jammu Kashmir. Model District EFA Plans completed in Chakwal, Kasur and Sheikhupura".

4.5. Summary

The different educational policies presented by the government of Pakistan, shows the concern of the government about the education sector reforms. These reforms have been spelled out properly, but the implementation has never been matched the fine words of the policies. Financial allocations have never been enough for meeting the requirements. And the result is that in Pakistan education sector gives the looks of an abandoned child.

Pakistan has planned its economy for 40 years through eight five year plans. And this study covers five of these five year plans. The nine five year plan was under preparation but before it could finalize, the government has changed its planning policies and has adopted annual roll on the plans.

An assessment of all the plans together shows a common pattern, every five year plan acknowledge the importance of the education sector. Ambitious targets have also been laid down. But it comes to allocation of funds; it does not show any improvement in the education sector. Similarly in case of emergencies when cuts have been applied, the education sector has received more than its share.
It shows that society as a whole does not realize the importance of education.

From 1995-96 onward 5-year plan was given up and instead yearly roll on planning was adopted, and this is in framework of perspective plan.

There were also some programs presented by the government for education and health as combined, they are Social Action Program (SAP), Millennium Development Goals (MDGs) and Medium Term Development Framework (2005-10). The detail of all these are given in appendix.

Chapter 5

The Retrospective Study of Health Sector

5.1. Introduction

This chapter intends to give a brief view of the different health policies and five year plans, presented by the government for the uplift of health sector in the country.

5.2. Historical Background

In 1947 Pakistan inherited a health care delivery system that was a legacy of the colonial British period. This system included public health services and some curative services. During initial phase (1947-1955), the important problem was the replacement of staff. From 1955 onwards, the concept of the five year plan was introduced to uplift the whole economy and especially the health sector, with these five year plans government also made some policies for the development of the health sector, these health policies are as under,

5.3. Health Policies over the Study Period

Different policies were presented by the government. These health policies are Health Policy 1990, Health Policy 1997, National Health Policy 2001 and Health Policy 2009. But all these policies are based on Alma Ata Declaration 1978.

5.3.1. Alma Ata Declaration 1978

The WHO and UNICEF jointly organized a conference held at Alma Ata in Kazakhstan (former Soviet Union) on September 1978. This conference led to a historical declaration calling for qualitative change in the approach to health of people in developing countries. In 1978 Pakistan became one of the initial signatories of the WHO's Alma Ata declaration. Which led the foundation and target for "Health for All" by the year 2000 (WHO 1978).

5.3.1.1. Main points of Alma Ata Declaration

Following are the main points of Alma Ata declaration;

i) The conference confirmed that health, "Which is a state of complete physical, mental, and social wellbeing, and not merely the absence of diseases, is the fundamental human right and that the attainment of the highest possible level of health is a most important world-wide social goal".

ii) "The existing gross inequality in the health status of the people between developed and developing countries as well as within countries is politically socially and economically unacceptable and is therefore of common concern to all countries".

iii) "Economic and social development based on a New International Economic Order is of basic importance to the fullest attainment of health for all developing and developed countries".

iv) "The people have the right and duty to participate individually and collectively in the planning and implementation of their health care".

v) "All the governments of the world have the responsibility for the good health of their people".

vi) "Primary health care is essential health care based on practical scientific sound and socially acceptable methods and technology".

vii) "All governments should formulate national policies, strategies and plans of actions to launch and sustain primary health care".

viii) "All countries should cooperate in a spirit of partnership and service to ensure primary health care for all people for the attainment of health by people in any one country concerns and benefits every other country".

ix) "An acceptable level of "Health for All" the people of the world by the year 2000 could be attained through a fuller and better use of the world's resources".

The Alma Ata conference on primary health care called for urgent and effective national and international action to develop and implement primary health care throughout the world. This conference was the first health related international

declaration binding on Pakistan and other member countries. In Pakistan the first health policy was announced in 1990.

5.3.2. Health Policy 1990

The decade of the seventies can be regarded as the starting phase of a serious debate and consideration regarding health policy formulation. However, not until 1988 efforts were once again made to formulate a national health policy. The first health policy was presented in 1990.

5.3.2.1. Goal of the Health Policy 1990

The main aim of the policy was to provide a health care facility for the whole population. Public expenditure on health will be increased and further sources of income will be identified to meet the goal and finance the policy. The first health policy 1990 recognizes the importance of primary health care.

5.3.2.2. Objectives of the Health Policy 1990

Following were the objectives;

i) Throughout the country, primary health will be available to all the citizens without any discrimination.

ii) Management boards will be created for the decentralization of health care administrative structure.

iii) "Scope and jurisdiction of Employees Social Security institutions will be broadened".

iv) "By giving incentives private health sector would enlarge and improved and will be regulated by provincial commissions".

v) "A list of essential drugs will be introduced".

5.3.2.3. Major Targets of the Health Policy 1990

i) "To make primary health care available to the entire population with goals being , immunization, drug packets for the treatment of 22 common cadre of trained personnel to be created for attending pregnancy and childbirth".

ii) "To enhance nutritional status so that, at least 90% of newborn infants have a birth weight of at least 2.5 Kg".

iii) "To reduce infant mortality rate up 50 per thousand".

iv) "To increase life expectancy at birth up 60 years".

v) "To increase public expenditure up to 5% of GNP on health and these would be equitably distributed between urban and rural areas".

5.3.2.4. Main Features of the Health Policy 1990

i) "Universal health coverage to all those who cannot afford to pay for health services".

ii) "Democratization of health administration".

iii) "Provision of trained health personals".

iv) "Health insurance would be introduced".

v) "For better management there would be health management boards and committees".

5.3.2.5. Implementation of Health Policy 1990

i) "Basic health services established on an integrated basis".

ii) "The community involved at the outset in identifying its needs".

iii) "With the implementation of this policy in modern record keeping medical audit system and health information reporting system introduced".

iv) "Educating people in health lifestyle to provide back up support to all programs".

5.3.3. Health Policy 1997

The Health Policy 1997 was introduced into a situation when the Social Action Program had already been implemented. Therefore, health issues were the focus of attention of international organizations and the government at the same time.

5.3.3.1. Vision 2010 of Health Policy 1997

"The government is committed to achieve the goal of "Health for All" through primary health care. This aims to create a platform for social change to improve the living standard. This was based on a concept of health with its physical, mental and social dimensions, where health is an important indicator of quality of life and national development".

The Vision 2010 is a comprehensive development program for all health sectors. The main aim is reducing the burden of ill health from preventable causes. Apart from primary health care program a highly organized and well equipped tertiary level care will be available at reasonable prices. The end goal of all health programs would be to ensure basic services and promote a better quality of life for attaining maximum national development. The detail of targets of vision 2010 in health policy 1997 is given in the table,

Table # 5.1
Targets for the Vision 2010

Index	1998	2003	2010
Infant Mortality Rate (per 1000)	86	40	20
Maternal Mortality Rate (per 10,000)	350	200	90
Life Expectancy at birth	62	65	69
Children below 01 year fully immunized (%)	65	90	100
Expectant mothers fully immunized against tetanus (%)	60	80	100
Eradication of Polio	By Year 2000		
Trained Personnel attending pregnancy at birth (%)	20	70	100
Low birth weight babies (%)	25	10	05
Oral Rehydration Therapy use (%)	70	90	100
Iron Deficiency Anemia (%) i) Woman ii) Children	 40 30	 20 20	 5 5
Goiter prevalence Rate (%)	15	10	1.0
Doctors	75000	133,000	142,000
Dental Surgeons	3,000	6,000	15,000
Nurses	24,800	35,000	50,000
Paramedics	115,000	170,000	215,000
Traditional Birth Attendant	50,000	60,000	65,000
Community Health Workers (Female)	45,000	75,000	100,000

Source: *Health Policy 1997*

5.3.3.2. Objectives of the Health Policy 1997

i) All the population will be provided with promotive, preventive, curative and rehabilitative services with easy and effective access.

ii) The community will be involved in the health sector through the creation of awareness.

iii) Reproductive health services will be expanding including family planning in rural as well as urban areas.

iv) Different health care programs will be gradually integrated with primary health care like malaria control, nutrition etc.

v) The prevalence of malnutrition will be reduced.

5.3.3.3. Strategies for the Health Policy 1997

Following are the main strategies of Health Policy 1997;

i) The district health system will be strengthened to deliver the basic elements of primary health care and provide the necessary support in training and logistics and also supervise the performance of health workers at all levels,

ii) At regional health cares and basic health units' satisfactory staff level will be ensured for human resource capacity building.

iii) Referral system will be improved to ensure equitable accessibility to emergency, secondary and tertiary health care services.

iv) Direct and effective community involvement will be endured and there would be coordination and collaboration between health and other sectors and non-government organizations.

v) Private health sector and different national health schemes will be introduced to alternative approaches for financing health care.

vi) In an effective district health system all vertical programs will be integrated into primary health care at the operational level.

vii) For controlling communicable diseases innovative strategies will be promoted.

viii) Planning will be decentralized to the gross-roots level.

5.3.3.4. Areas of Priority of Health Policy 1997

The end aim of the Health Policy 1997 is to improve the standard of health of all populations. For this purpose areas of priority selected, are as under;

(i) Most serious health problems,

"The first priority would be constituted of concrete efforts on the most serious health problems. These problems include diarrheal diseases acute respiratory infections immunizable diseases and malnutrition".

(ii) Risk of population trap

"The promotion of extensive reproductive health services including family planning would be taken".

(iii) Poverty and ill health

"The case of ill health is lying in poverty, and a considerable proportion of the peoples' surviving acquires the greatest urgency. In this like situation it is very difficult that health intervention can do more to improve health conditions".

5.3.4. National Health Policy 2001

This policy was presented on 12th June 2001. This policy toke forwards the agenda for health sector started by the government. The new health policy has identified ten key strategies for the health sector, which have the potential to bring about a major improvement in the delivery of health care. Health Policy 2001 provides an overall national vision for the health sector based on "Health for All" approach.

For the success of any policy the most important thing is implemented. The Health Policy 2001 has outlined implementation plan and has also set targets and time frame for each identified key areas over the period of 10 year period. All these have to be implemented in partnership between the federal ministry of health and provincial departments of health. The private sector would also be taken on board while implementing the policy.

5.3.4.1. Key Features of the Health Policy 2001

i) "Health sector investments are viewed as part of the government's poverty alleviation plan".

ii) "Priority attention is accorded to primary and secondary sectors of health to replace the earlier concentration on tertiary care".

iii) "Good governance is seen as the basis of health sector reform, which will achieve quality health care".

5.3.4.2. Overall vision of Health Policy 2001

i) "The overall national vision for the health sector is based on "Health for All" approach".

ii) "A series of measures programs and projects have been identified as the means for enhancing equity, efficiency and effectiveness in the health sector".

iii) "The Health Policy 2001 document is a blueprint of planned improvements in the overall national health scenario".

5.3.4.3. Specific Areas of Reforms

In Health Policy 2001 ten specific areas of reforms has find workout they are as follows,

i) "Reducing widespread prevalence of communicable diseases".

ii) "Removing professional /managerial deficiencies in the district health system".

iii) "Promoting greater gender equity".

iv) "Bridging basic nutritional gaps in the target population".

v) "Correcting urban bias in health sector".

vi) "Introducing required regulation in private medical sector".

vii) "Creating mass awareness in public health matter".

viii) "Effecting improvements in the Drug Sector".

ix) "Capacity building for health policy monitoring".

In each of these areas strategic objectives have been identified and implementation modalities determined. The new health policy has developed a clear view of what is required to be done in the key areas.

New Health Policy 2001 will act as a collective framework and provide guidelines to the provinces while implementing plans in the health sector in accordance with the requirements.

5.3.5. Health Policy 2009

Health is an essential prerequisite of individuals, families, communities and nations cannot achieve their goals of development without being healthy. The New Health Policy 2009 is based on health as a right of everyone and this would be driven by the following key principles:

5.3.5.1. Principles of Health Policy 2009

Following are the key principles of Health Policy 2009;

i) "Ensuring universal coverage of an essential package of health to all the citizens".

ii) "Health outcomes would be improved through overcoming social and economic inequalities".

iii) "Promotion of a result based culture ensuring a shift from a planning environment concentrated on the reporting of the process and outputs to outcomes".

iv) "Provision of quality care to everyone".

v) "Ensuring good governance, promotion of meritocracy and transparency in every aspect of health care management".

vi) "Promoting evidence based decision making which must prevail at every level of the health system so that policy development and actions deriving from policies are relevant, feasible, resource appropriately and culturally and socially acceptable".

5.3.5.2. Vision of Health Policy 2009

"A health system that is efficient, equitable and effective to ensure acceptable, accessible and affordable health services. It will support people and communities to improve their health status while it will focus on addressing social inequities and inequities in health and is fairly responsive and pro-poor thereby contributing to poverty reduction".

5.3.5.3. Objectives of the Health Policy 2009

Following are the objectives of health policy 2009;

i) "Improving and enhancing coverage and access essential health services".
ii) "Reducing the burden of diseases".
iii) "Protecting the poor and underprivileged population subgroups against catastrophic health expenditure and risk factors".
iv) "Strengthening the health system with a focus on resources".
v) "Strengthening stewardship functions in the health sector".
vi) "Improving evidence based policy making and strategic planning in the health sector".

5.3.5.4. Strategic Priorities

"Addressing the gaps in the health sector requires a fundamental change in the thinking that informs health policy at all levels. The paradigm shift requires that the objectives of the health policy would be to serve the needs of the people especially poor and vulnerable. This implies changes in all health sector parameters: what health services offer; who benefits from health services; what programmatic and system reforms should be in place; and how the resource cost to be shared. In addition, it is critical that the federal, provincial/area and district governments' re-affirm achieving health related Millennium Development Goals (MDGs) by 2015. To transform this commitment into action, the federal and provincial/ area governments will develop, implement and monitor health sector strategic frameworks to achieve health related MDGs

and the following policy objectives of the National Health Policy 2009". (Health Policy 2009)

5.4. Five Years Plans over the Study Period

As stated earlier that for the uplift of the whole economy the mechanism of five year plans was formed, so here we discuss the health status in these five year plans.

5.4.1. 4th Five Year Plan (1970-78)

Economic development and social progress are closely linked with the health of the people. And the health of the people is dependent not only on the health services but also on the environment and food supply.

Ever since the inception of the planning process in Pakistan, better health standards have been regarded on the one hand as essential for accelerating the speed of development and on the other an ultimate goal of the development effort. It is this reason that increasing allocations were made in the health sector.

The strategy of the 4th plan seeks to strike a proper balance between curative and preventive services. In this plan highest priority would be assigned to rural health services. Another factor which had hampered the smooth development of health programs were the acute shortage of trained personnel of all categories.

5.4.1.1. Objectives of the 4th Plan

i) "To improve the living and working environment of the population through better sanitation, water supply and other facilities etc".
ii) To provide better nutrition and nutritional education.
iii) To develop and improve comprehensive health services through health centers and sub-centers.
iv) To provide special health care to infants, children, adolescents and mothers.

v) To setup industrial health establishment to fight against the most prevalent diseases, to care for the workers and their families.

vi) To provide sufficient number of referral hospitals with the facilities of specialist services to deal with seriously ill patients at the sub-division and district levels.

vii) To provide and ensure sufficient drugs for preventive health measures.

viii) To train doctors, teachers, specialists and paramedical staff, and

ix) To integrate services at all levels from district down to union level.

5.4.1.2. Major Targets of 4th Plan

Following were the main targets of the 4th plan,

a) Malaria eradication

b) Smallpox eradication

c) B.C.G. Immunization and tuberculosis control

d) Leprosy control and

e) Maternity and child health services.

For these objectives an allocation of Rs. 2445 million were made the detail of which is as under,

Table # 5.2
Detail of the Allocation during 4th Plan for the Sub-Sectors of health

	Programs	East Pakistan	West Pakistan	Center	Total
1	Malaria Eradication	120	140	2	262
2	Rural health programs	400	300	---	700
3	Tuberculosis	20	25	6	51
4	Communicable diseases	100	65	3	168
5	Hospital beds	440	225	49	714
6	Medical education and training	275	110	52	437
7	Health and medical research	---	---	8	8
8	Loan to private sector	45	35	---	80
9	Azad Kashmir Northern regions	---	---	15	15
10	Centrally administered Regions	---	----	10	10
	Grand Total	1400	900	145	2445

Source: *4th Plan*

Following are the Physical Targets of 4th five year plan which were set for the plan,

Table # 5.3
Physical Targets for the 4th Plan

		East Pakistan		West Pakistan		Center		Total
A	Medical Manpower							
	Year	1970	1975	1970	1975	1970	1975	1975
1	Doctors	8052	10177	13400	16150	---	---	26327
2	Nurses	700	5000	4700	8340	---	500	13840
3	Lady Health Visitors	262	2540	1881	2781	---	---	5321
4	Midwives	---	2540	1790	2024	---	---	4564
5	Sanitary Inspectors	928	2540	1200	2024	---	---`	4564
6	Health Technicians	2162	2540	---	2024	---	---	4564
7	Health Assistants	---	2540	---	2024	---	---	4564
8	Lab. Technicians	---	536	---	500	---	---	1036
B	Other Targets							
9	General Beds	9723	25000	25100	37000	1200	2300	64300
10	T.B. Beds	---	---	3000	4700	---	200	1166
11	R.H. Centers	147	600	83	550	---	---	1150
12	R.H. Sub Center	150	1670	250	1650	---	---	3320
13	Medical colleges	7	8	6	7	---	---	15
14	Institute of post Graduate Medicine	---	---	---	---	1	1	2
15	Institutes of Hygiene	---	---	1	1	---	---	---
16	School of Tropical Medicine	---	---	---	---	---	1	1
17	Nurses Training Institutes	5	9	21	25	1	1	35
18	L.H.V. Training Schools	3	5	5	5	---	---	10
19	Midwives Training schools	---	---	36	41	---	---	5
20	Premedical Institutes	1	8	4	8	---	---	16
21	T.B. Training institute	1	---	---	---	---	---	---

Source: *4th Five Year Plan*

(1970 figures show the current position in the country and 1975 shows the targets.)

During the 4th five year plan remarkable progress was made in the health sector. Health expenditure as percentage of GDP rose from 0.47% in 1970 to

0.72% in 1978. Malaria program was given special importance. The number of medical colleges was increased from 6 to 15 and medical student's enrollment increased from 900 to 4000 annually. Nurses increased from 5400 to 9711 and leady health visitors from 1881 to 3250. Drug Act was introduced in 1976 also.

5.4.1.3. Physical Achievements of 4th Plan

Following are the some physical achievements in the health sector during 1970-78,

Table # 5.4
Physical Achievements in Health Sector during 1970-78

S.No	Sub-Sector	Benchmark 1969-70	Estimated achievement during 1970-78
1	Doctors	13400	9362
2	Nurses	5400	4311
3	Nurses Training Centers	21	7
4	Lady Health Vistors	1881	1369
5	Hospital Beds	32063	14029
6	Rural Health Centers	86	203
7	Sub-Centers of RHCs.	250	491
8	Medical Colleges	6	9
9	Training Schools for Auxiliaries	---	4

Source: *4th Five Year Plan*

5.4.2. The 5th Five Year Plan (1978-83)

In 1978 health and demographic situation in Pakistan was characterized by a high birth rate and the comparative low death rate and high growth in population. By 1977-78 health expenditure as percentage of GNP rose to 1% and also estimated that 50% of the population would be in the 2-mile distance of the outlets of the modern health services of public and semi-public sector.

5.4.2.1. Objectives and Targets of the 5th Plan

Following are the objective and targets of the 5th plan,

i) To make available the modern health cover within 2-4 mile distance to the entire population.

ii) To reduce the crude death rate from the present 14 per thousand to 10.2 per thousand.

iii) To reduce the infant mortality rate from 105 per thousand live births to 79 per thousand.

iv) To increase the life expectancy from 54 years for men to 60 years with corresponding increases for women from 53 to 59 years.

5.4.2.2. The Main Strategy during the 5th plan

i) There will be a shift from doctor-oriented strategy for health services to a three tier system consisting of doctors, paramedical and community health workers.

ii) A better balance will be achieved between facilities available in the urban areas and those provided in the rural areas.

iii) Substantial progress will be made with the integration of special programs with the health services in a manner which does not jeopardize the fulfillment of objectives of special programs,

iv) There will be a shift from curative to preventive measures,

v) And also there would be a rapid acceleration in output of paramedical and auxiliary staff.

5.4.2.3. The Specific Quantitative Targets

The specific quantitative targets of the plan are as under,

i) To provide at least minimal health care to the entire population,

ii) With an additional 5221 units of basic health units and rural health centers the ratio of population served per health unit would be improved from 12494 or population per unit in 1978 to 7660 of population per unit in 1982-83,

iii) Existing facilities in urban areas would be improved and modernized,

iv) All tehsils and district hospitals would be provided with modern equipment and specialists to provide proper medical care to city dwellers.

v) Incidence of malaria would be reduced to a level when it would be no longer a public health problem.

vi) Zero level of smallpox would be maintained.

5.4.2.4. Physical Targets of 5th Plan

There were also some Physical Targets of the plan they are as follow,

Table # 5.5
Physical Targets of the Plan

S.No	Item	Benchmark	Target	End Position
Physical Facilities				
1	Basic Health units	5850	4596	10446
2	Rural Health Centers	289	625	914
3	Hospital Beds	46092	25820	71912
Health Manpower				
1	Doctors	12924	12917	25841
2	Dentists	1047	595	1642
3	Nurses	4300	4780	9080
4	Paramedical	15428	24886	40314
5	Dispensers	9000	----	9000
6	Community Health Worker	1621	50371	51992

Source: 5th Five Year Plan

For all these activities 6600 million was allocated, and this represented an increase of 160% over the previous plan. The recurring expenditure on health was estimated to increase from Rs.558 million in 1977-78 to 13895 million in 1982-83.

The detail of allocation for different programmes of the 5th plan is as below,

Table # 5.6
Allocation for the 5th Plan

S.No	Programs	Million Rs.
1	Rural Health Programs	2900
2	Preventive Programs	1400
3	Hospital facilities	2030
4	Health Manpower development	900
5	Medical Research	74
6	Miscellaneous	60
	Total	7304

Source: *5th Five Year Plan*

5.4.2.5. Physical Achievement of the 5th Plan

During the plan period 625 regional health units and 4596 basic health units were planned but at the end of plan only 206 regional health centers and 1617 basic health units were built., the target for infant mortality rate was set 105 per

1000 to 79 per 1000, but it could be reduced to only 100. Life expectancy at birth was 54 for male and 53 for women and was targeted to increase it to the level of 60 for male and 59 for women, but the plan failed to do so. In some other fields the plan also showed some improvement the target for doctors was 13512 and importantly got the figure of 10203 which is 75% of the target, same the was the case with nurses the plan got 89% of the target.

5.4.3. The 6th Five Year Plan (1983-88)

In order to improve the quality of life, there is crying need to remove the general scarcity of adequate health services. It was considered necessary to establish a nationwide integrated system of health care. This would involve a nationwide consolidation and expansion in terms of physical infrastructure properly equipped and staffed by adequately trained and motivated persons. The traditional medicine would be given its due place in the national plan. Obviously the allocation both for capital and revenue budget would be increased manifold.

To find a fundamental solution to the nationwide scarcity of good health services, the allocation of capital outlay and revenue budget for health sector were increased considerably for the 6th plan. The total outlay for 6th plan was Rs. 13 billion.

5.4.3.1. Objectives of the 6th Plan

Following are the objectives of 6th plan, they are as,

i) To reduce the crude death rate from the present 12 per thousand to about 10 per thousand.
ii) To reduce infant mortality rate from 100 per 1000 to 60 per 1000.
iii) To increase the life expectancy from 54-55 years to 60 years.
iv) To reduce the communicable diseases from the present 30% to a negligible level.
v) To protect all children and newborn against six preventable diseases of children on a regular basis.

vi) To eliminate third degree malnutrition among children.

vii) To provide assistance during child birth to every mother by trained birth attendants.

viii) To prevent as far as possible occurrence of disabilities and care of the disabled for better prospects of life.

5.4.3.2. Policy Shifts

i) Emphasis on preventive care by protecting all children by poly-immunization against the six preventable diseases of childhood.

ii) Consolidating of existing facilities in contrast to the expansion and development of rural health infrastructure.

iii) Each rural health facility to be manned by a qualified doctor.

iv) Double shifts in the outpatient departments of all teaching district and Tehsile headquarter hospitals.

v) Involvement of community in primary health.

vi) Proper management training to health functionaries.

vii) Introduction of users charges to reduce subsidies.

5.4.3.3. Targets of 6th Plan

Physical infrastructure, the physical infrastructure needed to meet the requirements of a nationwide network would be as follows,

i) Conversation of 2620 existing facilities in basic health units with doctor residences.

ii) Construction of 2600 new basic health units with attached residence for the doctors and staff.

iii) Construction of 355 new rural health centers.

iv) Construction of 1715 doctor's residence at the existing basic health units.

v) Provision of 3500 teaching beds in existing medical colleges and another 3500 in district hospitals and 1220 beds in the tehsile hospital for referring care.

vi) Hotel accommodation for house surgeons, physicians and trainee registrars.

Table # 5.7
The Physical and Health Manpower at the end of 6th Plan,

	Facility		Targets	Cumulative Total June, 1988
A	Infrastructure			
	i)	Hospital beds	11770	63170
	ii)	Rural health centers	355	729
	iii)	Basic health units	2600	4315
	iv)	Sub-center, dispensaries	2600	2600 (1)
B	Manpower Development			
	i)	Doctors	21000	36000
	ii)	Dentists	600	1700
	iii)	Nurses	5000	10000
	iv)	Paramedics	38000	75000
	v)	Community health workers	30000	45000

(1) These sub-centers would be upgraded to basic health units.

Source: *6th Five Year Plan*

For all these objective and targets 13 billion was allocated during the 6th plan, the details are as under,

Table # 5.8
Capital Outlay for Health during the 6th Plan

S.No.	Sub-sector	Million Rs.	%
1	Medical education	975	7.5
2	Hospital Beds	3295	25.35
3	Preventive Programs	1490	11.46
4	Rural Health Program	5660	43.54
5	Dental care etc.	250	1.92
6	Medical Research	85	0.65
7	Traditional Medicine	375	2.89
8	Disabilities	500	3.85
9	Nutrition programs	250	1.92
10	Miscellaneous	120	0.62
Total		13000	100

Source: *6th Five Year Plan*

5.4.3.4. Physical Targets Achieved during the 6th Plan

i) During the 6th plan the child death ratio decreased from 12% to 11% per 1000.
ii) The Infant mortality rate reduces from 98.5 per 1000 to 80 per 1000.
iii) Life expectancy increased to 61 years.
iv) 85% of union councils were provided with basic health units or rural health centers.
v) Nearly 100% of children up to 5 years were fully immunized. This immunization saved 100,000 children from dying and another 45000 from getting disabled.
vi) The number of traditional birth attendant was rising to 30,000.
vii) Treatment of diarrhea by oral rehydration salts made satisfactory progress.

5.4.4. The 7th Five Year Plan (1988-93)

Although there has been a steady improvement in overall health in the past few years, much remains to be done. Malaria still remains a potential threat. The 7th plan aimed at improving the quality of care removing urban-rural imbalances, minimizing drug abuse treating persons suffering from TB and establishing a national school health services and effective accident and emergency services. Imbalance in health manpower would be removed.

5.4.4.1. Objectives of the 7th Plan

i) "To reduce infant mortality rate from 80 to 60 per thousand".
ii) "To increase the life expectancy from 61 to 63 years".
iii) "To protect all newborns from neo-natal tetanus".
iv) "To prevent occurrence of first degree malnutrition".
v) "To prevent occurrence of new cases of goiter in areas where it is pandemic".
vi) "To reduce the occurrence the communicable diseases further".

5.4.4.2. Major Policy Directions

i) "Emphasis will be placed on improving the quality of care at all levels".

ii) "Outreach services would be provided by properly trained health auxiliaries".

iii) "A nationwide school health services would be introduced".

iv) "Emergency and allied services would be further improved".

v) "Nutritional status will be improved".

vi) "Fertility regulation will be a focal point of primary health".

vii) "Existing imbalance in health manpower development would be removed".

viii) "Health insurance at least for critical illness would be introduced,

ix) Prevention of occurrence of disabilities and the care of the disabled would be continued".

x) "Establishment of private clinics and hospitals will be encouraged by the provision of appropriate incentives".

5.4.4.3. New Initiatives

There were some New Initiatives in the 7th Plan they are as follows;

i) "Provision of health auxiliary in each census village to facilitate access to basic health units/ rural health centers".

ii) "To reduce the congestion in hospitals and to improve the specialize care, primary health care centers would be provided in urban areas".

iii) "Management of Public Health system would be improved".

iv) "Child spacing to be an integral part of the nationwide health programs".

5.4.4.4. Strategy for Nationwide Health Care System

Following are the strategies which adopted during the 7th plan for the nationwide health care system;

i) Primary Health Care in Rural Areas

For the improvement of maternity and child health care system, all the basic health units and rural health centers would be improved. These centers would be provided with special beds and a labor room space for monitoring growth of children and immunization facilities.

ii) Primary Health Care in Urban areas

Primary health centers would be established in all major urban areas on the basis of one such center for a population 25000 persons.

iii) Preventive Aspects

Along with the focus on curative aspects emphasis would be remain on prevention of disease.

For all these activities 13350 million budgets were allocated, the budget detail for the 7th plan is as under,

Table # 5.9
Health Sector Allocation for 7th Plan year wise

Program	1988-89	19989-90	1990-91	1991-92	1992-93	Total (Rs. Million)
Preventive programs	257	210	194	183	180	1024
Rural Health	1367	1330	1046	960	952	5655
Hospital Beds	502	574	626	697	718	3117
Urban Health Centers	42	45	189	201	215	692
Health Manpower Development	476	394	421	455	412	2158
Nutrition programs	10	35	49	58	60	212
Medical Rehabilitation	2	22	32	42	62	160
Traditional Medicine	8	37	47	45	51	188
Miscellaneous	23	24	22	35	40	144
Total	2687	2671	2626	2676	2690	13350

Source: *7th Five Year Plan*

5.4.5. The 8th Five Year Plan (1993-98)

In spite of slow improvement in the health sector over the years, the position is not yet satisfactory. The health status is characterized by a high rate of population growth rate (3% per annum) an infant mortality rate of 86/1000. The major killers are diarrhea and pneumonia in children, complication in pregnancy in women, accidents in adults and cardiovascular disease and cancer in elderly. Drug abuse has emerged as a public health problem.

At present (1993) there is one doctor for 2330 persons, one dentist for 49600 persons one primary health care facility for 14900 persons (rural). There are some other problems with the health sector as inadequate primary health care, high rate of population growth rate, prevalence of communicable disease etc. (8th plan)

5.4.5.1. Policy Initiatives of the 8th Plan

i) To bring about a balance in the rural-urban health structure and provide services at door step.

ii) To improve the quality of services a balance would be created between primitive, preventive and curative care and removal of inequalities. The weakness of health management would be addressed and the health sector would be decentralized.

iii) During the 8th plan Economic Coordination Council of the cabinet has set up a committee to review the manufacture, import, sale and quality of drugs and medicines in Pakistan.

iv) The status of mental health services would be improved.

v) For the control of cancer the 8th plan proposed the following steps,

Cancer registries would be established and the existing hospital based registries be made permanent and a registry would be established in every major city.

For early detection of cancer the treatment facilities would be improved, and each hospital should have the facility of detection.

And besides , these measures would be taken to educate people about primary and secondary prevention of tumors.

5.4.5.2. Landmarks of the 8th Plan

The main achievements for the 8th plan are as under,

i) Up gradation of basic health units and rural health centers.

ii) At village level 33000 female village health workers would be inducted.

iii) Preventive services would cover 90% of the population.

iv) Decisions "shift to health education".

v) Imbalances in manpower would be removed and specially the shortage of nurses, paramedics and pharmacists.

vi) Up gradation of hospital management.

vii) Rs. One billion would be allocated to narcotics.

5.4.5.3. Physical Targets for 8th Plan

Following are the physical targets for the 8th plan.

Table # 5.10
8th Plan Physical Targets

S.No.	Sub-sector	Targets
1	Immunization (Million Children)	22.08
2	ORS (Million Packets)	92.5
3	Training of Traditional Birth Attendant	57744
4	Community Health Workers	37811
5	New Basic health Units	252
6	New Rural Health Centers	45
7	Strengthening/Improvement of BHUs	3874
8	Strengthening/improvement of RHCs Civil Hospitals	492
9	Mohall Health Centers	616
10	Dispensaries (New)	494
11	Mobile Dispensaries	40
12	Hospital beds	21500
13	Doctors	17300
14	Dentist	925
15	Nurses	18000
16	Paramedics	48500

Source: *8th Five Year Plan*

For all these objective and strategies an allocation of Rs.9100 million was made, the details of these are, as under,

Table # 5.11
Financial Estimates for the 8th Plan 1993-98

S.No.	Description	Cost (Million Rs.)
Federal		
1	Administrative Organization	284.1
2	Population Welfare Services Islamabad District	59.7
3	Non-Governmental Organizations	300
4	Target Group Institutions	8.8
5	MCH population welfare services in AJK	22.1
6	MCH population welfare services in Northern Areas	12.4
7	Communication Strategy	380
8	Clinical Training through RTIs	200
9	Non-Clinical Training through RTIs	100.3
10	NRIFC	49.8
11	NRIRP	1.3
12	NIPS	108
13	Population Study Center	0.75
14	Monitoring and Research Centers	8
15	Contraceptive Requirement & Distribution	1418
16	Social Marketing of Contraceptive	14
17	Consultancy	5
18	Construction (population houses etc)	149.64
19	Unallocated	90.55
	Sub-Total	3212.640
Provincial		
1	Provisional, Divisional, District and Tehsil Setup	1385.88
2	Family Welfare Centers	1570.573
3	Mobile Service Units	436.593
4	Reproductive Health Services	989.541
5	Involvement of TBAs in population welfare program	93.723
6	Family Planning Workers, supervisor & training centers	975.218
7	Involvement of Health Outlets and Provincial Line Deptt. In population welfare program	71.486
8	Involvement of Registered Medical Practitioners, Hakeem Homeopaths in population welfare program	41.939
9	Communication Strategy	222.403
10	Innovatives	20.004
11	Construction	80
	Sub-Total	5887.360
	Grand Total	9100

Source: *8th Five Year Plan*

After the 8th plan the government of Pakistan stopped the series of the five year plan and instead of these plans, the government adopted for rolling on a plan. Government every year allocated budget for health.

5.4.6. Health Sector Reforms

In Pakistan, national health policies were formulated in 1990, 1997 and 2001. The aim of these health policies was the development of health sector in the country. These policies aimed to strengthen the health care system and bring about the needed reforms in all areas of health. However, due to reasons of improper implementation and gaps in action on the decided agenda of the two successive governments, these policies did not meet their objectives. The problems faced by the health sector were: "Poor management of health services; Poor quality of services; Low utilization of health care facilities at primary health care level; Absenteeism and unprofessional attitude of staff; Shortage of resources, supplies, medicines etc... Lack of basic facilities like transport, communication, safe water, sanitation, electricity, security etc.; Administrative delays; Lack of incentives for staff to improve performance; Lack of career structure for doctors, paramedics, nurses, and other health staff; Lack of accountability of staff to communities; Inefficient use of resources; Unresponsiveness to community needs; over-centralization; corruption; lack of supportive supervision/monitoring and external interference".

To correct these problems Health Sector Reforms (HSR) was introduced in 2003. Basically HSR is the aspirations and initiatives by the government to take-up the task of remodeling and mending the health sector. The aim of these reforms is to provide a better, efficient, and perpetually progressive system of health care.

5.4.6.1. Objective of the HSRs

Following are the objectives of the HSRs,

i) "To address the health problems in the country by providing promotive, preventive, curative, and rehabilitative services and for these facilities the entire population has effective access".

ii) "To implement full and viable decentralization of powers and restructuring of the health management and planning system".

iii) "To bring about community participation through the creation of awareness, change of attitudes, organization and mobilization of support".

iv) "To improve the utilization of health facilities by bridging the gap between the community and the health services".

v) "To expand the delivery of maternal child health services including family planning both in urban and rural areas of Pakistan".

vi) "To expand the delivery of Mother Child Health/Reproductive Health services including family planning both in urban and rural areas of Pakistan".

vii) "To gradually integrate existing health care delivery programs like Expanded Program for Immunization, Malaria Control, Nutrition, and Mother Child Health, within the Primary Health Care based Healthcare system".

viii) "To improve the nutrition status of mothers and children and reduce the prevalence of malnutrition".

ix) "To promote proper inter-sectoral action and coordination at all levels".

x) "To achieve public - private sector partnership for the provision of health care to masses".

5.4.6.2. Guiding Principles

Following are the guiding principles for HSRs,

i) "Decentralization of Powers".

ii) "Training of health human resource in Good Governance".

iii) "Integration of different health programs".

iv) "Community participation and responsibility in its own health promotion".

V) "Inter-sectoral collaboration; Active participation of private sector".

5.5. Summary

The purpose of this chapter was to cover all the health policies and five year plans and other programs presented by the government for the uplift of the health sector in the country.

Although the process of health policy started in 1990, but Pakistan was signatory to Alma Ata 1978 declaration, so the government has designed the health policies in light of the Alma Ata Declaration.

The Alma Ata declaration confirmed that health, is a state of complete physical, mental, and social wellbeing, and not merely the absence of diseases. In 1990 the government for the first time presented its health policy. The main aim of the policy was to provide the whole population with basic health facilities. Public expenditure on health will be increased and additional sources of income will be identified to meet the goal and finance the policy.

The second health policy was presented in 1997 with the aim that all the population will be provided with promotive, preventive, curative and rehabilitative services with easy and effective access. The community would be involved in the health sector through the creation of awareness.

The third health policy was presented in 2001. The policy's vision is based on "Health for All" approach. This policy aims to implement the strategy of protecting people against hazardous diseases. And finally the last health policy presented in 2009.

During 4th plan (1970-78), public expenditure on health rose to Rs. 684.34 million, and a significant progress in the expansion of health facilities was made.

During the 5th plan 206 Rural Health Centers and 1,617 Basic Health Units were built. Life expectancy at birth was set 60 and 59 years for male and female respectively but again failed to do so.

The 6th plan (1983-88) could not meet its goals.

The 7th plan (1988-93) proposed some targets which were to be achieved during the plan. These were reduction in Infant Mortality Rate increasing life expectancy and protecting all newborns from neo-natal tetanus.

The 8th plan (1993-98) concentrated on maternal and child health.

Chapter 6

Results and Discussion

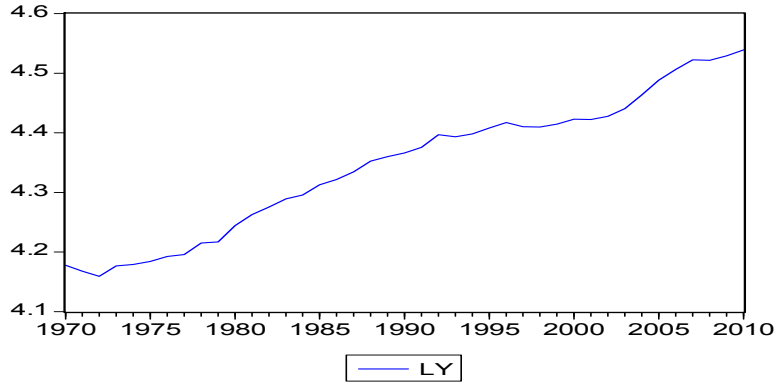
6.1. Introduction

This chapter summarizes the results and different tests operated for analysis of data and also present the results of economic and econometric model designed for the achievement of the objectives. A preliminary analysis of data is conducted. The stationarity of data was analyzed first with the help of graphical analysis and then checked by using ADF and PP tests. The long run relationships between education, health and economic growth was checked first by Engle-Granger two step procedure for cointegration and then by ARDL. The result of linear regression has been given to analyze the relationship between education, health and economic growth. For short run elasticities and to ascertain the existence of short run disequilibrium in the model the ECM is used.

6.2. Graphical Analysis of Variables

In order to analyze the data set, the figures of all variables in separate figures are shown. Figures along with their explanation are given as below. The details are as follows,

Figure 6.1
Trends in Log of GDP Per Capita in Pakistan (1970-2010)

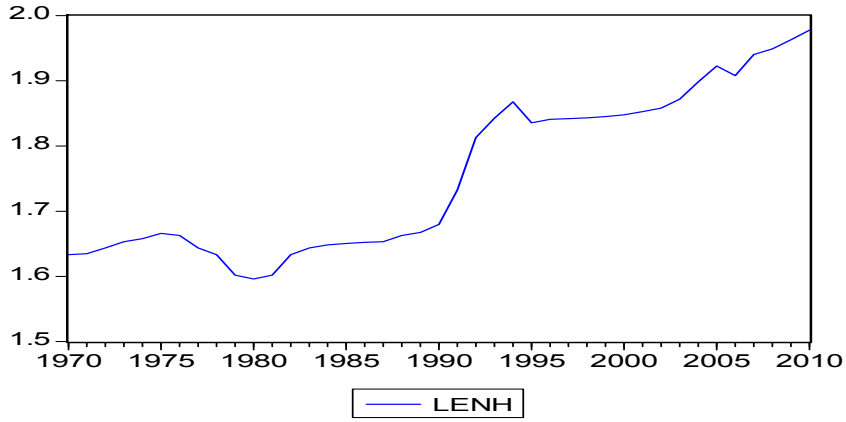


Source: A Hand Book on Pakistan Economy by SBP.

Figure 6.1 is a brief picture of the log GDP per capita (LY) in Pakistan during the sample period. Although there is a little fluctuation and downward trend at

the begging, but after 1973 there upward trends in the log GDP per capita, this shows an overall improvement during (1970-2010). The graph of the GDP per capita shows that there is upward increasing over time which indicates that this series is a unit root.

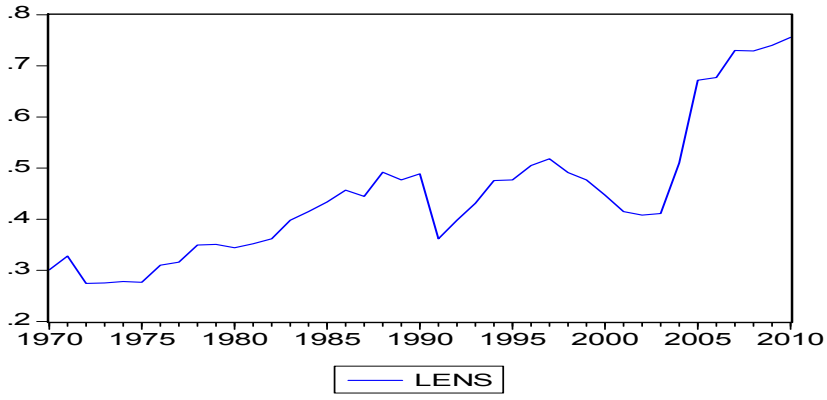
Figure 6.2
Trends in Log of Enrollment at Tertiary Level (1970-2010).



Source: A Hand Book on Pakistan Economy by SBP.

Figure 6.2 shows the fluctuation trend in the log of enrollment at tertiary level (LENH). From 1970 to 1990 there is fluctuation in enrollment at tertiary level, but after 1990 there is an upward trend in the enrollment. This shows the improvement in the enrollment at tertiary level. Log of enrollment at tertiary level shows an upward trend over time, which shows a unit root in the data series.

Figure 6.3
Trends in Log of Enrollment at Secondary Level (1970-2010)

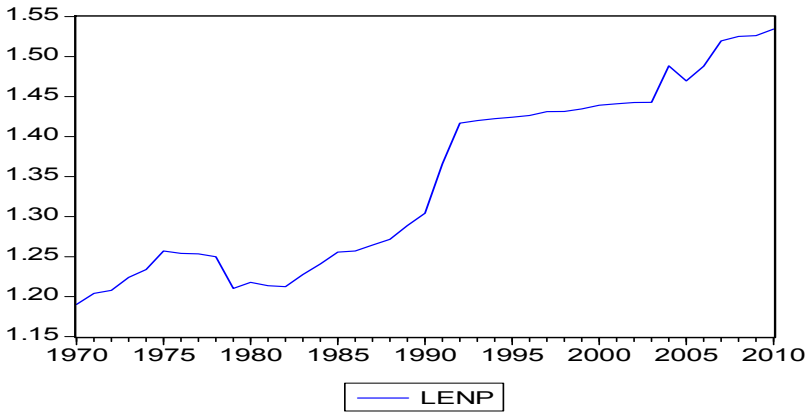


Source: A Hand Book on Pakistan Economy by SBP.

Figure 6.3 shows the picture of the log of secondary enrollment (LENS) for the period (1970-2010). There was a very slow increase in secondary enrollment from 1972 to 1988-89. In the year 1989-90 a sudden decrease in the enrollment. The same situation in the year 2003. After the year 2003 the situation improved considerably.

The log of secondary enrollment shows that there is a slight upward trend which means that the series is a unit root.

Figure 6.4
Trends in Log of Enrollment at Primary Level (1970-2010)

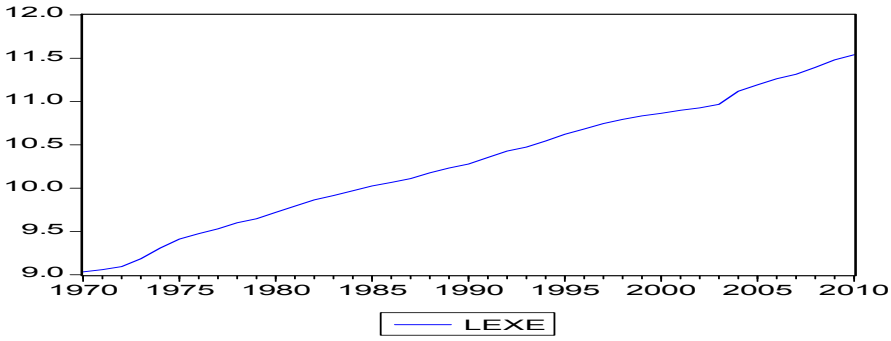


Source: A Hand Book on Pakistan Economy by SBP.

Figure 6.4 shows the Log of Enrollment at Primary (LENP) for the period (1970-2010). From 1970 to 1990, the situation is not very impressive. But after 1990 the situation becomes very impressive and the enrollment at primary goes up to almost 100%.

The series shows a strong trend over time which means a unit root.

Figure 6.5
Trends in Public Expenditure on Education (1970-2010)

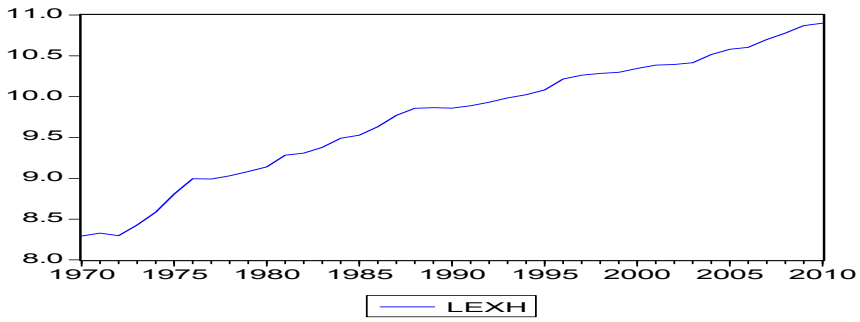


Source: A Hand Book on Pakistan Economy by SBP.

Figure 6.5 shows the log of public expenditure on education (LEXE) during the sample period (1970-2010). This shows an upward improvement but the rate of allocating funds to the education sector is very slow in Pakistan.

The series of expenditure on education shows that there is a strong trend over time which indicates a unit root in the series.

Figure 6.6
Trends in Public Expenditure on Health

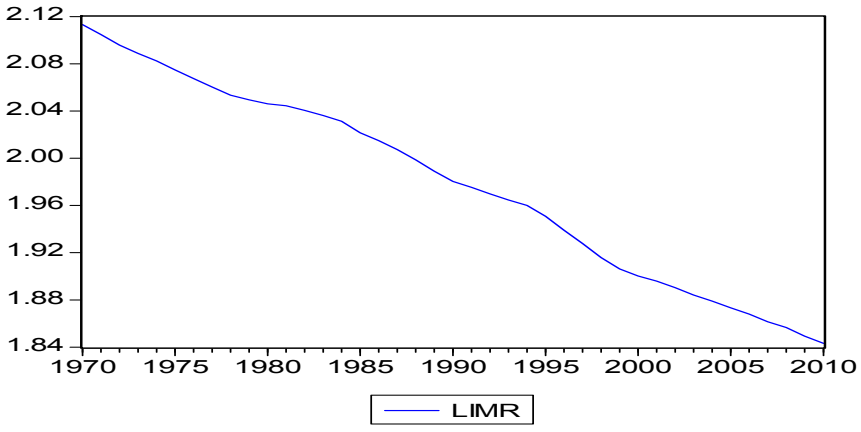


Source: A Hand Book on Pakistan Economy by SBP.

Figure 6.6 shows the history of log of public expenditure on health sector (LEXH) for the period 1970-2010. The health sector is also neglected sector in Pakistan, and a very low allocation is made for this sector which is clear from the figure 6.6.

The expenditure on health also indicates that there is a strong trend in the series which means a unit root in the series.

Figure 6.7
Trends of Log of Infant Mortality Rate

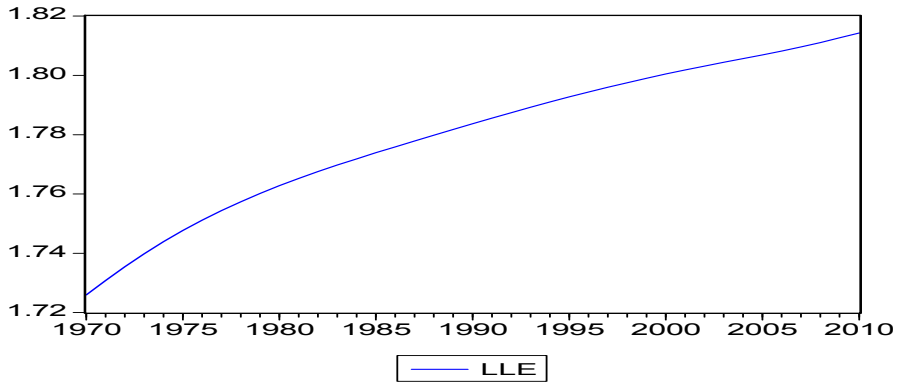


Source: A Hand Book on Pakistan Economy by SBP.

Figure 7.7 shows the log of infant mortality rate (LIMR) for the sample period (1979-2010). From 1970 to 2010 the situation of infant mortality rate has been improved in Pakistan due to better policies and improved services provided by the health sector. In spite of the fact that a very low allocation is made in the health sector.

The series shows that are upward trend in the series which indicates a unit root.

Figure 6.8
Trends in Log of Life Expectancy



Source: A Hand Book on Pakistan Economy by SBP.

Figure 6.8 shows the log of life expectancy (LLE) in Pakistan for the sample period (1970-2010). This also shows an overall improvement in the situation and that is due to better health policies and better services by the health sector in Pakistan.

The series of life expectancy also shows an upward trend which shows that there is a unit root in the series.

6.3. Unit Root Tests

Most of time series variables are not stationary and using non-stationary variables in the model might give misleading results. So, our first step is to examine the data, whether the variables have unit roots or they are stationary. For this purpose, the ADF and PP tests are used.

A variable is stationary if the calculated value of ADF and PP tests is higher than any of the tabulated Mackinnon values. Results of the ADF and PP tests are given in table 6.1 and 6.2. There are three separate tests conducted, once with intercept, once with intercept and trend and once with no intercept and no

trend term. The results exhibited that all the variables are non-stationary at level. For obtaining stationarity the variables are differenced. After taking the first difference, all the variables became stationary.

6.3.1. Augmented Dickey Fuller Test (ADF)

Below are the results of ADF test. The stationary is checked at level, once with no trend and no intercept, once with trend and once with intercept only. At level all the variables are unit root or they are not stationary. Similarly, after making the 1st difference of all the series once again the stationarity was checked once with the trend once with intercept and trend and once with no trend and no intercept. The results are as below,

Table # 6.1
ADF Test Results

Variables	Level			1st difference		
	Intercept	Trend	None	Intercept	Trend	None
LY	-0.2431 (0.9242)	-1.8970 (0.6370)	3.9793 (0.9999)	-5.2562 (0.0001)	-5.1495 (0.0008)	-2.9102 (0.0047)
LEXH	-1.8067 (0.3720)	-1.7671 (0.6983)	7.1139 (1.0000)	-4.2908 (0.0016)	-4.5246 (0.0045)	-1.2122 (0.2019)
LEXE	-0.2058 (0,9294)	-2.3780 (0.3839)	15.457 (1.0000)	-4.5946 (0.007)	-4.5538 (0.0041)	-0.8257 (0.3514)
LENS	0.0432 (0.9570)	-2.0365 (0.5637)	0.0432 (0.9570)	-5.0518 (0.0002)	-5.0371 (0.0011)	-4.3190 (0.0001)
LENS	0.0820 (0.9603)	-2.7012 (0.2418)	1.6563 (0.9743)	-5.2465 (0.0001)	-5.3600 (0.0005)	-5.0336 (0.0000)
LENH	-0.0934 (0.9431)	-2.3261 (0.4197)	1.5990 (0.9710)	-3.8439 (0.0054)	-3.9229 (0.0203)	-3.4210 (0.0011)
LIMR	0.0168 (0.9544)	-2.8212 (0.1987)	-2.5359 (0.1126)	-2.7779 (0.0707)	-2.7453 (0.2252)	-1.0261 (0.2691)
LLE	0.3229 (0.9764)	-3.5499 (0.1503)	-2.5359 (0.9978)	-3.1427 (0.0322)	-2.2353 (0.4591)	-1.6683 (0.089)

Source: Author's own calculation using E-views 5.

The calculated test statistics show that all the variables namely log of public expenditure on education and health, log of enrollment at primary, secondary and tertiary level, log of infant mortality rate, log of life expectancy and log GDP per capita are stationary at 1st difference.

6.3.2. Philips Peron Test (PP)

In this research PP test is also used to check the stationarity of time series data. The same procedure is followed as in case of ADF. First stationarity is checked at level with the trend, with intercept and with no trend and no intercept. Similarly all the variables are checked after making the 1st difference. These are also checked with trend with intercept and with no intercept and no trend. The results are as below,

Table # 6.2
PP Test Results

Variables	Level			1st difference		
	Intercept	Trend	None	Intercept	Trend	None
LY	0.2935 (0.9751)	2.2527 (0.4489)	5.2886 (1.000)	-5.2371 (0.0001)	-5.1205 (0.0009)	-2.8197 (0.006)
LEXH	2.3570 (0.1601)	1.5868 (0.7805)	7.1139 (1.000)	-4.1194 (0.0026)	-4.3540 (0.0070)	-2.4568 (0.0153)
LEXE	-0.20931 (0.9290)	-2.18727 (0.4834)	13.3772 (1.000)	-4.5491 (0.0008)	-4.4790 (0.0050)	-0.8828 (0.327)
LENP	0.13500 (0.9384)	-1.9293 (0.6207)	2.6511 (0.9975)	-5.0603 (0.0002	-5.0432 (0.0011)	-4.4004 (0.0001)
LENS	-0.06636 (0.9462)	-1.7971 (0.6874)	1.4146 (0.9585)	-5.2943 (0.0001)	-5.3771 (0.0004)	-5.0336 (0.0000)
LENH	0.37715 (0.9794)	-1.8229 (0.6748)	2.1146 (0.9906)	-3.8656 (0.0051)	-3.84801 (0.0243)	-3.4768 (0.001)
LIMR	-0.1188 (0.9403)	-1.7847 (0.6933)	-11.6940 (0.000)	-2.8527 (0.0603)	-2.81865 (0.1990)	-1.0261 (0.269)
LLE	-8.9313 (0.8900)	-13.5608 (0.8000)	6.2768 (1.000)	-7.1537 (0.000)	-2.3955 (0.3760)	-4.7477 (0.000)

Source: Author's own calculation using E-views 5.

The calculated test statistics show that all the variables namely log of public expenditure on education and health, log of enrollment at primary, secondary and tertiary level, log of infant mortality rate, log of life expectancy and log GDP per capita are stationary at 1st difference.

6.4. Cointegration

For checking long run or cointegration among GDP per capita, public expenditure on education and health, enrollment at primary, secondary and tertiary level, life expectancy and infant mortality rate. Two methods are used,

First, Engle Granger two step procedure for cointegration and second, Bound Testing for Cointegration or Auto Regressive Distributed Lags (ARDL).

6.4.1. Engle Granger two step procedure for Cointegration

The preliminary condition for Engle and Granger procedure is to check the stationarity of all variables. These variables have been already checked for stationary. (See table 6.1 & 6.2)

This method includes basically two steps, first run the regression of the equation (9), the results are as under,

Table # 6.3
Engle Granger 1st step

LY = 0.62910 + 0.10886*LENH + 0.10647*LENS + 0.02151*LENP +
(2.198008) (0.180771) (0.063117) (0.211976)
0.10009*LEXE + 0.04249*LEXH + 0.4088*LIMR + 0.6722*LLE+ e_i
(0.089578) (0.048892) (0.379796) (1.576177)

Source: Author's own calculation using E-Views.

The values in parenthesis are the standard errors.

Second step, saving equation (10) which is as under,

$$e_i = LY - LEXE - LEXH - LENS - LENH - LENS - LLE - LIMR$$

Then check these residuals for stationarity. We used ADF and PP tests for checking stationarity.

The results are as below.

Table # 6.4
ADF Result for EG 2nd Step

Variable	Level		
	Intercept	Trend	None
e_i	-2.7045 (0.0827)	-2.7562 (0.2275)	-2.7230 (0.0076)

Source: Author's own calculation using E-views

The values in parenthesis are the p-values.

According to ADF test these regression residuals are stationary at level, with intercept at 10% and with no intercept and trend at 1%.

Now checking the stationarity of residuals with PP test, the results are as under,

Table # 6.5
PP Test Results for EG 2nd Step

Variable	Level		
	Intercept	Trend	None
e_i	-2.9134 (0.0527)	-2.8862 (0.1775)	-2.9530 (0.0042)

Source: Author's own calculation using E-views 5.
The values in parenthesis are p-values.

PP test also shows that the regression residuals are stationary at level with intercept at 10% and with no trend and intercept at 1%.

Both the tests confirmed that the regression residuals are stationary at level. So it is concluded that there is a long run relationship between GDP per capita, Public expenditure on education and health, enrollment at primary, secondary and tertiary level, life expectancy and infant mortality rate.

6.4.2. ARDL

Here we check the cointegration with the help of ARDL method. Below are the tables 6.6 and 6.8. Table 6.6 is an over-parameterized model of two lags of difference variables; similarly Table 6.8 is also an over-parameterized model of one lag of difference variables.

Table # 6.6
Over-Parameterized Model of ARDL 2Lags

DLY = 6.83- 0.177*DLY(-1) - 0.76*DLY(-2) + 0.43*DLENH - .341*DLENH(-1)
(8.290) (0.1836) (0.1778) (0.0996) (0.1255)
- 0.294*DLENH(-2) + 0.013*DLENP - 0.0694*DLENP(-1) + 0.0880*DLENP(-2)
(0.06818) (0.0908) (0.114) (0.1586)
+ 0.1549*DLENS - 0.0202*DLENS(-1) - 0.0654*DLENS(-2) - 0.0533*DLEXE +
(0.0729) (0.0412) (0.0405) (0.0726)
0.223*DLEXE(-1) + 0.27*DLEXE(-2) + 0.0075*DLEXH - 0.0693*DLEXH(-1) +
(0.0718) (0.0811) (0.0197) (0.0238)
0.038*DLEXH(-2)- 0.7946*DLIMR + 4.7499*DLIMR(-1) - 0.4013*DLIMR(-2) +
(0.0188) (0.5204) (0.685) (0.477)
12.4763*DLLE + 232.5692*DLLE(-1) - 292.9681*DLLE(-2) - 0.4686*LY(-1) +
(94.099) (91.977) (111.94) (0.2284)
0.4990*LENH(-1) + 0.1496*LENS(-1) - 0.2310*LENP(-1) - 0.2619*LEXE(-1) +
(0.1984) (0.125) (0.1758) (0.0839)
0.0262*LEXH(-1) - 1.2825*LIMR(-1) - 0.1679*LLE(-1)
(0.0431) (0.2985) (5.145)

Source: Author's own calculation using E-views.
The values in parenthesis are standard errors.

Now for checking the joint significance of the variables the partial F-test is used.

The result is as under,

Table # 6.7
Wald Test

Test statistic	Value	Df	Probability
F-statistic	14.27827	(8, 6)	0.0022

Source: Author's own calculation using E-views 5.

(3.65—4.66, 2.79—3.67 and 2.37—3.20 are the lower and upper critical values for Bound testing ARDL for 1%, 5% and 10% significance levels, respectively.)

The results show that the value of calculating the F - statistic is greater than the critical values of 1%, 5% and 10% respectively, so there is a long run relationship or cointegration among the variables of interest.

Table # 6.8
Over-Parameterized Model of ARDL one lag

DLY = -7.88 + 0.272*DLY(-1) + 0.21*DLENH + 0.03*DLENH(-1) + 0.168*DLENP
(6.1557) (0.241) (0.1783) (0.111) (0.1317)
- 0.1129*DLENP(-1) + 0.1311*DLENS + 0.01967*DLENS(-1) - 0.0933*DLEXE+
(0.1432) (0.057) (0.0596) (0.0789)
0.01712*DLEXE(-1) + 0.01697*DLEXH - 0.03011*DLEXH(-1) - 1.3750*DLIMR +
(0.0988) (0.0340) (0.0357) (1.0832)
1.6948*DLIMR(-1) + 166.3861*DLLE - 121.4617*DLLE(-1) - 0.8395*LY(-1) +
(0.7410) (103.38) (106.77) (0.275)
0.0546*LENH(-1) + 0.1030*LENS(-1) - 0.0386*LENP(-1)- 0.0873*LEXE(-1) –
(0.2315) (0.0805) (0.1929) (0.07682)
0.0176*LEXH(-1) - 0.1288*LIMR(-1) + 7.1316*LLE(-1)
(0.052) (0.337) (3.9316)

Source: Author's own calculation using E-views.

The values in parenthesis are standard errors.

For checking the joint significance of variables partial F-test is used.

The result is as under,

Table # 6.9
Wald Test

Test statistic	Value	Df	Probability
F-statistic	2.296247	(8, 15)	0.0786

Source: Author's own calculation using E: views 5

(3.65—4.66, 2.79—3.67 and 2.37—3.20 are the lower and upper critical values for Bound testing ARDL for 1%, 5% and 10% significance levels, respectively.)

The calculated F-statistic is lower than the values of 1% and 5%, so we conclude that there is no long run relationship or cointegration between the GDP per capita, public expenditure on education, public expenditure on health, enrollment at primary, secondary and tertiary level, life expectancy and infant mortality rate.

6.4.2.1. Parsimonious ARDL Model

For making a parsimony model of ARDL, this research follows the methodology of David Hendry from general to specific. First a general model

of ARDL with two lags and one lag is given and then a stepwise omitting those variables which are insignificant.

The general model of ARDL with two lags is given in table 6.7 and with one lag in table 6.8, here the insignificant variables were omitted stepwise and the final parsimonious model is as under,

Table # 6.10
Parsimonious ARDL Model

DLY = -8.5227 + 0.08666*DLENH + 0.1787*DLENS + 0.2260*DLENP –
(3.0154) (0.1300) (0.0337) (0.1001)
0.08788*DLEXE - 0.014436*DLEXH + 34.0055*DLLE - 0.6903*DLIMR +
(0.0604) (0.0222) (15.435) (0.5907)
1.51342*DLIMR(-1) - 0.5409*LY(-1) - 0.004847*LENH(-1) + 0.1546*LENS(-1) –
(0.5922) (0.1308) (0.1155) (0.0511)
0.04774*LENP(-1) - 0.10778*LEXE(-1) - 0.05187*LEXH(-1) + 7.2463*LLE(-1)
(0.1105) (0.0595) (0.0251) (2.0148)
- 0.2340*LIMR(-1)
(0.2310)
$R^2 = 0.803581$ $R^2(adj) = 0.660731$

Source: Author's own calculation.
The values in parenthesis are standard errors.

Here R^2= 0.80358,1 which mean that 80% of the variation in the dependent variable is explained by independent variables, so a good fit to model.

This is the parsimonious ARDL model. In this model all the variables are significant.

Now we check the partial F-test.

The result is as under,

Table # 6.11
Wald Test

Test statistic	Value	Df	Probability
F-statistic	4.805172	(8, 22)	0.0016

Source: Author's own calculation using E-Views

(3.65—4.66, 2.79—3.67 and 2.37—3.20 are the lower and upper critical values for Bound testing ARDL for 1%, 5% and 10% significance levels, respectively.)

The calculated value of the F - statistic is greater than the values of critical values at 1%, so there is a long run relationship or cointegration among the variables of the Parsimonious ARDL model.

6.4.3. Diagnostic Tests for testing the validity of the Parsimonious ARDL model

Some diagnostic tests were also conducted for checking the Serial Autocorrelation, Heteroscedasticity, ARCH and parameter stability of ARDL and ECM model. They are as,

6.4.3.1. Autocorrelation

Breusch-Godfrey or LM test is carried out to test for serial autocorrelation. The result is as under,

Table # 6.12
Results of Breusch-Godfrey Test

F-statistic	0.656615	Probability	0.431317
Obs*R-squared	1.747195	Probability	0.186230

Source: Author's own calculation using E-Views

Here the probability of F-state is greater than 5% i.e. (43%), so it is concluded that there is no auto- correlation between the errors of the parsimonious ARDL model.

6.4.3.2. Heteroscedasticity Test

For checking heteroscedasticity of the residuals the White Heteroscedasticity Test is used the result is as under,

Table # 6.13
Results of white Heteroscedasticity Test

F-statistic	1.986615	Probability	0.175262
Obs*R-squared	35.01954	Probability	0.283028

Source: Author's own calculation using E-views.

The result shows that the probability is greater than 5% i.e. (17%), which confirms that there is no heteroscedasticity.

6.4.3.3. ARCH Test

Auto Regressive Conditional heteroscedasticity test, the result is as under,

Table # 6.14
Results of ARCH Test

F-statistic	1.049559	Probability	0.312444
Obs*R-squared	1.076484	Probability	0.299486

Source: Author's own calculation using E-views.

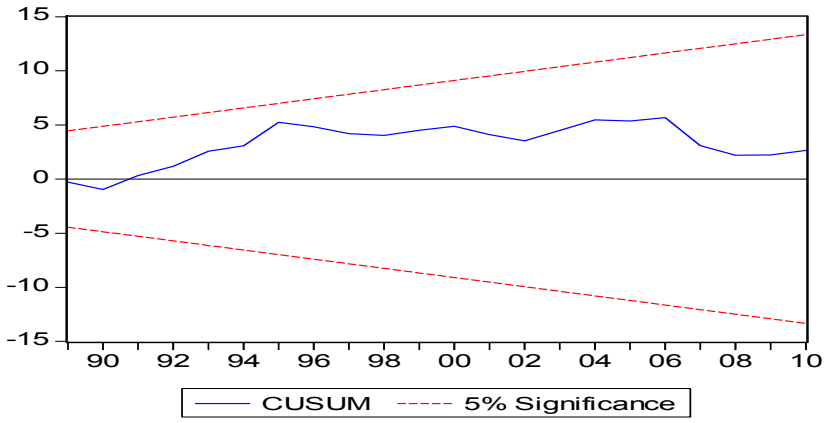
The result shows that the probability is greater than 5% i.e. (31%), which means that there is ARCH.

6.4.4. Stability of the Model

For checking the stability of the parsimonious ARDL model the following tests are used. They are as,

Figure 6.9

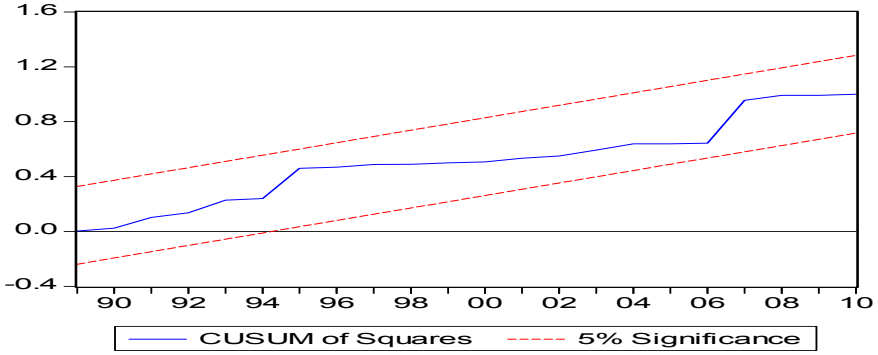
Cumulative Sum of Recursive Residuals (Cusum)



Source: author's own calculation using E-views.

These two straight lines show the 5% significance level and the plotted line is inside these lines. This means that the model is stable.

Figure 6.10
Cusum Square



Source: Author's own calculation using E-views

The two straight lines show the 5% critical lines and the fitted line is inside the two. This means that the model is stable.

6.5. Empirical Result of linear Regression Model

The linear regression model is used to analyze the relationship between GDP per capita, public expenditure on education, public expenditure on health, enrollment at the primary level, secondary level, tertiary level, infant mortality rate and life expectancy. OLS technique is used for estimation.

The results of the linear regression are as under,

Table # 6.15
Result of linear Regression Model

LY = 0.1088*LENH + 0.113*LENS + 0.0215*LENP +				
	(0.1807)	(0.0531)	(0.209)	
0.097255*LEXE + 0.0339*LEXH + 0.6722*LLE + 0.4388*LIMR				
(0.0895)	(0.0358)	(1.5761)	(0.367)	
$R^2 = 0.98$	$R^2(adj) = 0.98$			

Source: Author's own calculation using E-views 5

The values in parenthesis are standard error.

The results of linear regression show that public expenditure on education and health, enrollment at primary, secondary and tertiary level, infant mortality rate and life expectancy are all statistically significant. The positive sign of all explanatory variables shows that these have a strong and positive impact on

GDP per capita. The value of R^2 and adjusted R^2 is 98%, which shows a good fit.

A rational for this is that, whenever there is an increase in public expenditure on education and health by the government, education and health become accessible for the general people and especially for the poor. This leads to more educated and healthy people, and in turn increases in people's income. The elasticities of expenditure on education and health are 0.09 and 0.0324, in other words, holding all other variables constant a 1% increase in public spending on education and health leads to 9% and 3% increase in GDP per capita respectively. The elasticities of enrollment at primary, secondary and tertiary level are 0.0215, 0.1064, and 0.1088 respectively, which means that holding all other variables constant a 1% increase in enrollment at the primary level, secondary level and tertiary level will bring about a 2% a 10% and a 10% increase in GDP per capita respectively. Similarly the elasticities of life expectancy and infant mortality rate are 0.6722 and 0.4088 respectively. This means that holding all other variables constant a 1% increase in life expectancy and infant mortality will bring about a 62% and 48% increase respectively. It is clear from this regression results that public expenditure on education and health, enrollment at primary, secondary and tertiary level, infant mortality rate and life expectancy have a positive and stronger impact on GDP per capita.

6.6. Error Correction Model (ECM)

A General ECM model is given as under,

Table # 6.16
General ECM model

DLY = 0.008 + 0.25*DLY(-1)+ 0.09*DLENH - 0.045*DLENH(-1)+0.100*DLENS –					
	(0.1552)	(0.119)	(0.0792)	(0.034)	(0.0386)
0.01848*DLENS(-1) + 0.2125*DLENP –0.13602*DLENP(-1) -					
	(0.1015)	(0.1120)	(0.0615)		
0.01208*DLEXE+0.0072*DLEXE(-1) + 0.01277*DLEXH - 0.055*DLEXH(-1) +					
(0.0737)	(0.0271)	(0.0251)	(0.0980)		
17.66*DLLE - 15.26*DLLE(-1) – 0.487*DLIMR + 1.16*DLIMR(-1) - .391*R(-1)					
(24.532)	(22.527)	(0.7747)	(0.6446)	(.15269)	

Source: Author's own calculation using E-views

The values in pretenses are standard errors.

The ECM indicates that the first difference of GDP per capita (DLY) depends on the first difference of public expenditure on education (DLEXE), the first difference in public expenditure on health (DLEXH), the first difference on enrollment in primary (DLENP), the first difference of enrollment at the secondary level (DLENS), the first difference of enrollment in tertiary level (DLENH), the first difference in life expectancy (DLLE) and first difference of infant mortality rate (DLIMR). The regression results indicate that short run changes in GDP per capita.

6.6.1. A Parsimonious ECM Model

For making a parsimonious ECM model, the methodology of David Hendry is followed from general to specific i.e. omitting the insignificant variables stepwise.

Table # 6.17
Regression Result of Parsimonious ECM

DLY = 0.417*DLY(-1) + 0.205*DLENH + 0.0895*DLENS – 0.00803*DLENS(-1)
(0.1485) (0.1122) (0.0334) (0.0353)
+ 0.1665*DLENP- 0.1829*DLENP(-1) + 0.01189*DLEXE - 0.0056*DLEXE(-1) +
(0.0996) (0.0967) (0.0579) (0.0712)
0.01750*DLEXH – 0.0688*DLEXH(-1) + 2.01908*DLLE - 1.32040*DLIMR +
(0.0252) (0.0242) (1.3099) (0.7045)
1.08675*DLIMR(-1) – 0.3674*ECM(-1)
(0.6322) (0.1425)

$R^2 = 0.66 \quad R^2(adj) = 0.52$

Source: Author's own calculation using E-views

The values in parenthesis are standard values.

The results show that estimated ECM term is negative and significant suggesting error correction is happening in the model. The coefficient of ECM is –0.3674, suggesting that approximately 36% of disequilibrium in a previous year is corrected in the current year. Other estimated coefficients show that in the short run only to enrollment at primary, secondary and tertiary, public spending on education and health and life expectancy have significant impact on per capita GDP.

The value of R^2 is 0.66 showing that the explanatory variables explain 66% of changes in the dependent variable. It also means that the variables chosen are strong in explaining economic growth.

6.6.2. Diagnostic Testing for Parsimonious ECM

Following are the diagnostic tests for the checking the serial auto-correlation, heteroscedasticity and Auto Regressive Conditional heteroscedasticity (ARCH) of the parsimonious ECM model.

6.6.2.1. Auto Correlation

For serial auto-correlation the following test is used,

Table # 6.18
Breusch-Godfrey or LM Test

F-statistic	0.501019	Probability	0.611868
Obs*R-squared	1.455384	Probability	0.483023

Source: Author's own calculation using E-views

The result of the test shows that the probability is greater than 5% (i.e. 60%) so there is no serial correlation in the model.

6.6.2.2. Heteroscedasticity Test

For checking heteroscedasticity of the residuals the White Heteroscedasticity Test is used the result is as under,

Table # 6.19
Results of White Heteroscedasticity Test

F-statistic	1.148332	Probability	0.403989
Obs*R-squared	25.86236	Probability	0.360186

Source: Author's own calculation using E-views

The result shows that the probability is greater than 5% so there is no heteroscedasticity in the model.

6.6.2.3. ARCH Test

Auto Regressive Conditional heteroscedasticity test, the result is as under,

Table # 6.20
Results of ARCH Test

F-statistic	0.532886	Probability	0.591730
Obs*R-squared	1.124561	Probability	0.569908

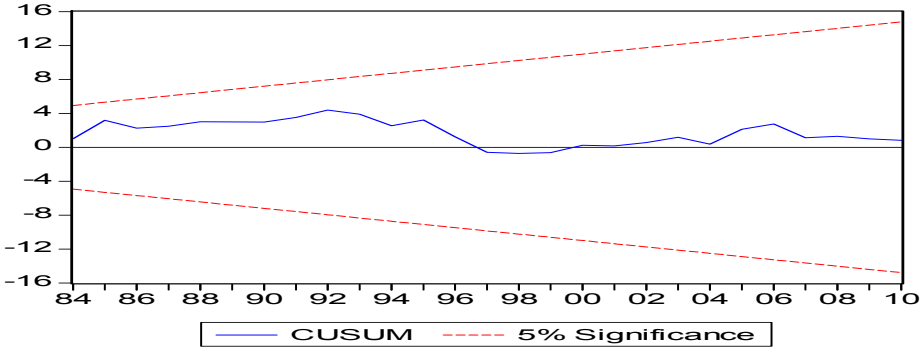
Source: Author's own calculation using E-views.

The result shows that the probability is greater than 5% i.e. (59%) so there is no Auto regressive conditional heteroscedasticity in the model.

6.6.3. Stability of the Model

Stability of Parsimonious Model is checked by Cusum and Cusum Square. They are as under,

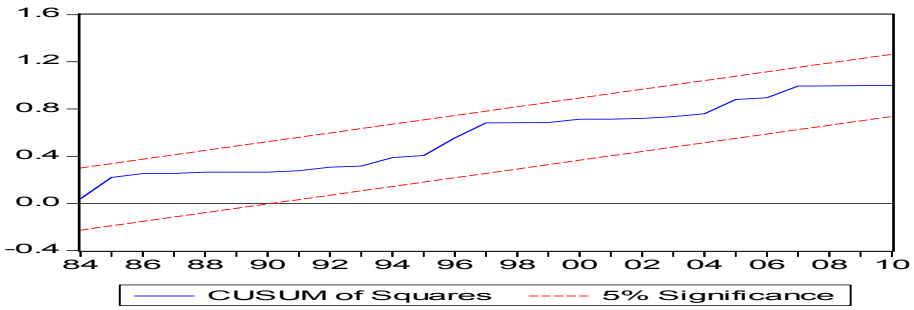
Figure # 6.11
Cusum



Source: Author's own calculation using E-views.

These two straight lines are 5% significance level and the plotted line is inside these lines. This means that the model is stable.

Figure # 6.12
Cusum Square



Source: Author's own calculation using E-views.

These two straight lines are 5% significance level and the plotted line is inside these lines. This means that the model is stable.

6.7. Summary

This chapter comprehensively described the results of different tests operated for analysis of data and for the achievement of the objectives.

It is clear from the results of ADF and PP tests, that all the eight variables were non-stationary at level whether trend or intercept is included. All the eight variables were stationary at first difference.

It is concluded from the Engle-Granger two step procedures for cointegration that all the variables are co-integrated and they have a long run relationship.

From the results of the ARDL bound testing approach to cointegration all the variables are integrated. The parsimonious ARDL model also confirmed that all the variables are co-integrated and also this model follow all the diagnostic tests.

The ECM model showed that short-run changes in expenditure on education expenditure on health enrollment at primary, secondary and tertiary level, life expectancy and infant mortality rate have great impact on the GDP per capita. The parsimonious ECM also confirmed that the all the variables have a short run relationship and also follow the diagnostic tests.

Chapter 7

Summary, Conclusion and Recommendation

7.1. Introduction

This chapter presents the findings derived from the study. Conclusions based on findings of the study, followed by appropriate suggestions have also been given in this chapter.

7.2. Summary and Findings of the Study

The main purpose of this study was to analyze the relationship between education health and economic growth, and investigates the impact of both on economic growth, and also to find the long run and short run relationship.

The results of the linear regression confirmed that there is a positive relationship between education, health and economic growth in Pakistan. Education and health have a positive and significant impact on economic growth. The elasticities of public expenditure on education and health is 0.09 and 0.03 respectively, this means that holding all other variables constant a 1% increase in public spending on education and health will bring about a 9% and 3% change in GDP per capita respectively. The elasticities of enrollment at primary, secondary and tertiary level are 0.0215, 0.1064, and 0.1088 respectively. Which means that holding all other variables constant a 1% increase in enrollment at the primary, secondary and tertiary level will bring about 2%, 10% and 10% increase in GDP per capita respectively. Similarly the elasticities of life expectancy and infant mortality rate are 0.6722 and 0.4088 respectively. This means that holding all other variables constant a 1% increase in life expectancy and infant mortality will bring about a 62% and 48% increase in GDP per capita respectively.

The value of R^2 and adjusted R^2 is 0.98 or 98%. This means that 98% variation in dependent variable is explained by the independent variables.

It is clear from all these results that if the government increases the budget of education more people will be educated which will result in more educated workers and resultantly lead to more production, research, efficient use of resources and raw materials and sufficient supply in the market. With more education, the income of people will also increase which will lead to more consumption and more demand.

Similarly if the government increases the budget of health in the country, this will have a great impact on the health of the general public. With good education and health, workers will be more educated and healthier. More educated and a healthy worker means more production, good quality and quantity. With good education and health people will earn more income. They will save and invest more and will bring progress in every sector of the economy.

From all these results it is clear that there is a positive and significant impact of education and health on economic growth and also has a positive relationship.

For the analysis of long run relationship. This study has used two techniques of cointegration i.e. Engle Granger two step procedure and ARDL.

The results of Engle and Granger cointegration technique, confirmed that Education, Health and Economic Growth have a long run relationship.

The result of calculated F-state of the over parameterized ARDL model of 2 lags is 14.2782, which shows that the value of the calculated F - statistic is greater than the critical values of 1%, 5% and 10% respectively, so there is a long run relationship or cointegration among the variables of interest.

Similarly the result of calculated F-state of the over parameterized ARDL model of one lag is 2.296247, the shows that the calculated value is lower than the values of 1%, 5% and 10%. This means that there is no cointegration among the variables of interest.

The parsimonious ARDL model was obtained by omitting stepwise elimination of insignificant variables following David Hendry methodology from general to specific. The result of calculated F-state test is 4.805172, this shows that the calculated value is greater that the tabulated value at 1%, so there is a long run relationship between education, health and economic growth.

The parsimonious ARDL model was also checked for heterosdaskcity, auto correlation, and ARCH and parameter stability. The result of white heterosedaskcity is 1.986615 with probability 0.175262 or 17%, this shows that the probability is greater than 5% level so there is no heterosedaskcity. The result of Breusch-Godfrey Test is 0.656615 with probability 0.431317 or 43%, here the probability is greater than 5% so no presence of auto correlation. The result of Auto Regressive Conditional heteroscedasticity is 1.049559 with probability 0.312444 or 31%, here the probability is greater than 5% so no ARCH. The results of CUSUM and CUSUM square indicate that the plotted lines are between 5% line of significance, which shows that the parameter are stable.

The value of R^2 is 0.8035 which mean that 80% of the variation in dependent variable is explained by the independent variables, so a good fit to model.

ECM also confirmed that there is also a short run relationship among education, health and economic growth. The percentage value of ECM is equal to 36.74% showing that 36.74% of disequilibrium will be adjusted in the next period.

Some diagnostic tests were also conducted for the parsimonious ECM model. The result of the white heterosedaskcity test is 1.148332 with probability 0.40398 or 40%, here the probability is greater than 5% so no presence of heterosedaskcity. The result of Breusch-Godfrey or LM Test is 0.501019 with probability 0.611868 or 61%, here the probability is greater than 5% so no auto correlation. The result of ARCH test is 0.532886 with probability 0.591730 or 59%, here the probability is greater than 5% so no ARCH. Parameters stability

was also checked with the help of CUSUM and CUSUM square. In both cases the plotted lines are in between 5% level of significance.

The value of R^2 Is 0.66 showing that the explanatory variables explain 66% of changes in the dependent variable. It also means that the variables chosen are strong in explaining economic growth.

7.3. Conclusion

The literature that studies the impact of Education and Health on economic growth is growing and is an important one. The aim of study was to contribute to this literature. The study examined this relationship using proxies for education and health, making use of recent developments in time series data, such as stationarity test and cointegration tests. Consequently, we were able to unveil the long-run impact of education and health on economic growth.

This study sets out to empirically examine the relationship between education, health and economic growth in Pakistan for the period 1970-2010, using annual time series data. Some statistical techniques have been used to investigate the long run and the short run relationship between education, health and GDP per capita. These techniques include linear regression line, Engle and Granger two step procedures for cointegration and ARDL, and for short run analysis ECM. Different proxies are used for education and health; they are public spending on education, enrollment at primary, secondary and tertiary level, and for health, public spending on health, infant mortality rate and life expectancy. ADF and PP tests were used for checking the stochastic characteristics of each time series.

Both techniques of cointegration confirmed that education, health and GDP per capita are co-integrated or have a long run relationship. Education and health play a very important role in determining the long run economic growth and have a major impact on it.

The study found that human capital is positively related to economic growth in Pakistan in the long run.

7.4. Recommendations

Following are the recommendations for education and health sector based upon the findings of this research,

(1) The standard of education and health should be improved in Pakistan including its availability. Good health not only improves the standard of living but also helps in raising return to investments in education.

(2) Technical change and efficiency are the factors important for growth as it is clear from the experience of developed countries of the world. Due attention should be given to technology and training and training should design in such a way that are according to our local needs. Steps should be taken in creating new opportunities for jobs.

(3) The private sector should be encouraged to improve its share in schools and hospitals.

(4) The government should create an environment of macroeconomic stability to encourage private investment in education and health sectors.

(5) Free education and healthcare programs established by the federal and provincial government should be improve and sustained.

(6) Overhauling of public education system, curriculum and teaching method should be done.

(7) The problem of low participation and high dropout in the education system should be corrected by reshuffling priorities of current education policy. Greater emphasize should be made on the promotion and development of basic education.

(8) Human capital embodied labor effects positively and significantly to economic growth, so this should be the main policy that government should increase investment in training programs for labor and technical education.

(9) A careful inspection and evaluation of educational programs by neutral bodies may initiate to avoid implementation delays and gaps.

(10) Communities should be effectively involved in the promotion of basic education and health.

(11) Market oriented approach in education should be emphasized.

(12) Special measures should be taken to reduce unemployment among the educated.

(14) Governments should give priority to developing health infrastructure.

(15) Health Management and Information System should be strengthened.

(16) A higher awareness of about health among the people is necessary.

(17) Government must accord priority to primary and secondary education and basic health care, and social spending must be targeted so as to ensure that the poorer segments of society also have adequate access to public education and health care.

(18) The analytical basis on which to formulate policies should be developed by a core group of researchers and policy analysts. The group should consist of analysts from social sciences and health, including economists' health economists and public health experts.

7.6. Policy Implication

The government needs to consider this aspect of economic development while formulating economic policies as a more educated and healthy workforce is bound to improve and raise the levels of productivity in the economy.

In Pakistan investment in human beings is underrated and neglected. But truly, this investment should be the growth of human capital. A major amount of budget should be allocated to education and health sectors.

Education must be regarded as an important and vital requirement for continuing scientific and technological progress.

To generate a process, to define health targets at the national and state level. The targets should include general health aspects such as food consumption, sanitation, housing and the environment.

To encourage social involvement in which citizens insist on government accountability and promote the accumulation of social capital in order to expand access to health and education services.

The private sector is playing a vital role in the health care service delivery in Pakistan. However, this sector needs to be regulated and monitored.

In view of the study's findings, it is hoped that the government of Pakistan will give continued support and invest in human resources development. This is especially in terms of education, health care and nutritional food supply.

Expenditure on general education and especially in vocational and technical education must continue to increase to produce enough manpower as required by the labor market so as to avoid the problem of a skilled labor shortage that can retard the growth of the economy. Another important issue which needs to be addressed is the impact of research and development on growth.

A comprehensive program to meet high level manpower needs in science and technology for the needs of Pakistan in 21th century.

Inculcate work ethics in the labor force so as to control the cost of production and ensure labor discipline.

References

Abbas, Q. (2000). The Role of Human Capital in Economic Growth: A Comparative Study of Pakistan and India. *The Pakistan Development Review, 39(4) pp. 425-445*

Abbas, Q. (2001). Endogenous Growth and Human Capital: A Comparative Study of Pakistan and Sri Lanka. *The Pakistan Development Review, 40(4), pp. 987-1007*.

Abbas, Q. and J. F. Peck (2007). Human capital and economic growth: Pakistan, 1960-2003. *Retrieved from www.cardiff.ac.uk/carbs/econ/workingpapers/papers/ 2007_22.pdf.*

Abbasi, K. (1999). The World Bank and World Health: Focus on South Asia II-India and Pakistan. *British Medical Journal*. 318, pp. 1132-1135.

Adenuga, A. O. (2002). Educational Expenditure and Performance in Nigeria (1970-2000). *Proceeding of the Annual Conference of the Nigerian Economic Society:* Human Resources Development in Africa, University of Ibadan.

Afzal *et al*. (2010). Relationship between school education and economic growth in Pakistan. ARDL Bounds Testing Approach to Cointegration. *Pakistan Economic and Social Review.* Vol 48 No 1 pp. 39-60.

Aga Khan University (2000). *Family Health Project Assessment Report* (unpublished)

Aghion, P., Howitt, P., (1998). *Endogenous Growth Theory*. MIT Press, Cambridge, Mass.

Ahmad, E., M. F. Arshad and A. Ahmad. (1991). "Learning and Earning Profiles in Pakistan's Informal Sector". *Pakistan Economic and Social Review*. Vol. XXIX, No. 2

Akaike, H. (1978). A Beyesian Analysis of the Minimum AIC Procedure. *Annals of the institute of Statistical Mathematics* 30: pp.9-14

Akram, M. (2008). Health Care Services and Government Spending in Pakistan. *PIDE Working Paper*.

Akram, N., Padda, I, and Khan, M. (2008). The Long Term Impact of Health on Economic Growth in Pakistan. *The Pakistan Development Review* 47:4 (Winter 2008), pp. 487-500

Ansari, M. I., and Singh, S.K. (1997). Public Spending on education and Economic Growth in India: Evidence from VAR Modeling. *Indian Journal of Applied Economics*, 6(2), pp. 43-64.

Appleton, S. and Teal, F. (1998). Human Capital and Economic Development. Economic Research paper, No. 39.

Arora, S. (2001). Health, Human Productivity and Long-Term Economic Growth. *The Journal of Economic History* 61 (3), pp. 669-749.

Asterious, D., and Agiomirgianakis, G.M. (2001). Human capital and economic growth: Time series evidence from Greece, *Journal of Policy Modeling*, 23, pp. 481-489.

Aurangzeb. (2002). Relationship between Health Expenditure and GDP in an Augmented Solow Growth Model for Pakistan: An Application of Cointegration and Error-Correction Modeling. *The Lahore Journal of Economics.* 8(.2)

A. W. Gregory, and B. E. Hansen. (1996). Residual-based tests for cointegration in Models with Regime Shifts. *Journal of Econometrics*, 70, pp. 99-126.

Ayara, N.A. (2002). *The Paradox of Education and Economic Growth in Nigeria*: Empirical Evidence. Human Resource Development in Africa: Selected Papers for the year 2002. Annual Conference, the Nigerian Economic society, Par 5 pp. 371-393.

Babatunde, M. A., & Adefabi, R. A. (2005). Long Run Relationship between Education and Economic Growth in Negeria: Evidence from the Johassen's Cointegration Apporacg. *Constrain and Oppertunities*, (pp. 1-25). Dakar Senegal.

Banerjee, A., Dolado, J., Galbraith, J. W. and Hendry, D. F. (1993). Cointegration, Error Correction and the Econometrics Analysis of Non-stationary Data, *Oxford University Press.*

Barro, R. J. (1991). Economic Growth in a Cross Section of Countries. *The Quarterly Journal of Economics, MIT Press.* 106(2), pp. 407-43.

Barro, R. J. Sala-i-Martin, Xavier (2004). *"Growth Models with Exogenous Saving Rates*". *Economic Growth* (Second ed.). New York: McGraw-Hill. pp. 23–84n

Barro, R. J. (1992). *Human capital and economic growth*. Proceedings, Federal Reserve Bank of Kansas City, pp. 199-230.

Barro, R. J. & Jong-Wha, L. (1994). Sources of economic growth. Carnegie-Rochester Conference Series on Public Policy, *Elsevier*, 40(1), pp. 1-46.

Barro R.J., and Sala-i-Martin, X. (1995). Economic Growth. New York: *McGraw Hill*.

Barro, R. J. (1996). Determinants of Economic Growth: A Cross-Country Empirical Study. NBER Working Papers 5698. *National Bureau of Economic Research, Inc.*

Barro, R. J. (1998). Notes on Growth Accounting. NBER Working Papers 6654, *National Bureau of Economic Research, Inc.*

Barro, R. J. & Jong-Wha L. (2000). International Data on Educational Attainment: Updates and Implications. *CID Working Papers* 42, Center for International Development at Harvard University.

Barro, R. J. (2001). Human Capital and Growth. *American Economic Review,* American Economic Association, 91(2), pp. 12-17.

Barro, R. J. & Jong-Wha L. (2001). International Data on Educational Attainment: Updates and Implications, *Oxford Economic Papers,* Oxford University Press, 53(3), pp. 541-63, July

Barro, R. J. (2003). *Determinants of Economic Growth in a Panel of Countries.* CEMA Working Papers 505, China Economics and Management Academy, Central University of Finance and Economics.

Barro, R. J. & Jong-Wha L. (2010). A New Data Set of Educational Attainment in the World, 1950–2010. NBER Working Papers 15902, *National Bureau of Economic Research, Inc.*

Becker. G. (1962). Investment in Human Capital. *Journal of Political Economy,* 70, pp. S9-S49

Behrman, J.R., Ross D. and Sabot R. (2006). Improving Quality versus Increasing the Quantity of Schooling: Estimates of Rates of Return from Rural Pakistan. *Journal of Development Economics*. xx.

Benhabib, J. and Spiegel, M. (1994). The Role of Human Capital in Economic Development, *Journal of Monetary Economics.* 34(2): pp. 143-174

Bhargava, Alok & Jamison, Dean T. & Lau, Lawrence J. & Murray, Christopher J. L., (2001). "Modeling the effects of health on economic growth," *Journal of Health Economics*, Elsevier, vol. 20(3), pages 423-440, May

Bils, M. and P.J. Klenow. (2000). Does Schooling Cause Growth? *The American Economic Review*, 90(5), pp.1160-1183

Bjorkman, J.W. (1986). Health Policies and Human Capital: The Case of Pakistan. *The Pakistan Development Review*. XXX (3). pp. 281-337.

Case, Anne, Angela Fertig, and Christina Paxson.2005. "The Lasting Impact of Childhood Health and Circumstance." *Journal of Health Economics,* 24(2): 365–89.

Chaudhry, I. S., Malik, A., & Farid, M. Z. (2010). Exploring the Causality Relationship Between Trade Liberalization, Human Capital,and Economic growth: Emprical Evidence from Pakistan. *Jounral of Economics and international finance, 2*(8), 175-82.

Chtterji, M. (1998). Tertiary Education and Economic Growth. *Regional Studies, 32(4). pp.349-354*

Chatterji, M & Colin T. (ND). *The Case For Subsidising Higher Education.* Dundee Discussion Papers in Economics 77, Economic Studies, University of Dundee.

Chatterji, M. (1998). Tertiary Education and Economic Growth, Regional Studies. *Taylor and Francis Journals*. 32(4), pp. 349-354.

Chatterji, M. (2008). *Education and Economic Development in India.* Dundee Discussion Papers in Economics 210, Economic Studies, University of Dundee

Chaudary, A. R., Iqbal, A., and Gillini, S. Y. M. (2009). The Nexus between Higher Education and economic Growth: An Emperical Investigation for Pakistan. *Pakistan Journal of Commerace and Social Science, .3*, pp. 100-110.

Christian, M. (2002). Education and Health Expenditure, and Development: The Cases of Indonesia and Peru. *Development Centre Studies*. (OECD Report 2002.)

Dablin, B.G. (2005). The impact of Education on Economic Growth: Theory, Finding and Policy Implications. *Working Paper Duke University*. USA.

Dauda, L. R. (2009). Role of Human Capital in Economic Development: An Empirical Study of Nigerian Case. Retrieved from *www.gcbe.us/2010_OBEC/data/Risikat%20Oladoyin%20S.%20Dauda.doc*

Davidson, J. E. H., D. F. Hendry, F. Srba & S. Yeo. (1978). "Econometric Modeling of the Aggregate Time Series Relationship Between Consumers' Expenditure and Income in the United Kingdom." *Economic Journal* 88: pp. 661–692.

David E. B., David C. & Jaypee S. (2001). The Effect of Health on Economic Growth: Theory and Evidence. NBER Working Papers 8587, *National Bureau of Economic Research, Inc.*

David N. W. (2005). Accounting for the Effect of Health on Economic Growth, NBER Working Papers 11455. *National Bureau of Economic Research*, *Inc.*

David N. W. (2007). Accounting for the Effect of Health on Economic Growth. *The Quarterly Journal of Economics, MIT Press,* 122(3), pp. 1265-1306.

Dickey, D.A. and Fuller, W. A. (1979). Distribution of the Estimators for Autoregressive Time Series with a Unit Root. *Journal of the American Statistical Association*, 74(366), pp. 427-431.

Dickey, D.A. and Fuller, W.A. (1981). Likelihood Ratio Statistics for Autoregressive Time Series with a unit root. *Econmetrica*, 49(4), pp. 1057-1072.

Dickey, D. A., D. P. Hasza, and W. A. Fuller. (1992). *Testing for Unit Roots in Seasonal Time Series, Advanced Text in Econometrics*. Oxford, New York, Toronto and Melbourne, Oxford University Press, 399-423.

Dreze, J. and Murthi, M. (2001). Fertility, Education and Development: Evidence from India, *Population and Development Review*, 27(1), pp33-63

Duma, N. (2007). *Sri Lanka's Sources of Growt*h. IMF working paper No. 07/225 source

Dutta, P.V. (2006). Returns to Education: New Evidence for India, *Education Economics*, 14(4), pp. 431-451.

Engle, R. (1982). Autoregressive Conditional Heteroskedasticity with Estimates of the Variance of UK Inflation. *Econometrica* 50: pp.987–1008.

Engel, R. and C. Granger. (1987). Cointegration and error correction: Representation, estimation and testing. *Econometrica*, 55, pp. 251-276.

ESCAP. (2003). The Role of Public Expenditure in the Provision of Education and Health. Economic and Social Survey of Asia and the Pacific (ESCAP). Retrieved form *http://www.un.org/esa/ffd/regionalcommissions/escap_Survey03-12.pdf*

F. Castro-Leal, J. Demery, and K. Mehra. (2000). Public Spending on Health Care in Africa: Do the Poor Benefit? *Bulletin of the World health Organization* 78:1. *http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2560601/*

Fogel, R.W. (1994). Economic Growth, Population Health and Physiology: the Bearing of Long-Term Processes on the Making of Economic Policy. *American Economic Review* 84, pp. 369-395

Finlay, J. (2005). Endogenous longevity and economic growth. Harvard School of Public Health Program on the Global Demography of Aging Working Paper No. 7.

Finlay, J. (2006). Health, Mortality, and Economic Development. *School of Economics. Natioanl University Austrila*.

Francis, B. and Iyare, S. (2006). Education and Development in the Caribbean: A Cointegration and Causality Approach. *Economics Bulletin*, 15 (2), pp. 1-13.

Gemmell, N. (1996). Evaluating the Impacts of Human Capital Stocks and Accumulation on Economic Growth; Some New Evidence. *Oxford Bulletin of Economics and Statistics* 58(1), pp.9-29

Gerdtham, *et. al*. (1992). An Econometric Analysis of Health Care Expenditure: A Cross-Section Study of the OECD Countries. *Journal of Health Economics* 11(1), pp. 63-84.

Goode, R. B. (1959). Adding to the stock of physical and human capital. *American Economic Review*, *49*(2), 147-155.

Granger,C.W.J. (1969). Investingating causal relations by econometric models and cross spectral methods, *Econometrica* , 37: pp. 428-438.

Granger, C.W.J. and Newbold, P. (1974). Spurious regression in econometrics. *Journal of Econometrics.*

Granger, C.W.J. (1988). Some recent development in the concept of causality, *Journal of Econometrics*, 39, pp. 199-211.

Greene, W. (2003). *Econometric Analysis*. New Jersey: Prentice Hall.

Green, A., Rana, M., Ross, D., & Thunhurst, C. (1997). Health planning in Pakistan: A case study. *International Journal of Health Planning and Management.* 12(3). pp.187-205.

Green, L.W., & Kreuter, M.W. (1999). *Health Promotion Planning: An Educational and Ecological Approach*. Mountain View. Mayfield Publishing Company.

Guajarati, D.N. (1988). *Basic Econometrics.* (2nd edition). New York: McGraw-Hill, Inc.

Gujarrati, D.N. (2003). *Basic Econamatrics* (4th edition) , United Stat Militry Academy, McGraw Hill New York.

Gundlach, E. (1996). Human Capital and Economic Development: A Macroeconomic Assessment. *Kiel Institute of World Economics, Working paper No.778.*

Gupta, S., V. Marijn, and R. T. Erwin. (2002). The Effectiveness of Government Spending on Education and Health Care in Developing and Transition Economies. *European Journal of Political Economy* 18.

Gupta, M.R. and B. Chkarborty. (2004). *Human Captail Accumulation and Endogenous Growth in a Dual Economy.* Economic Research Unit, Indian Statistical Institute, Kolkata 700108. Weat Bengal, India

Gutema P. and Mekonnen B. (2004). Does Schooling Promote Economic Growth? *African Development Review,* pp. 385-398.

Gylfason T. and G. Zoega. (2003). Education, Social Equality and Economic Growth: A View of the Landscape, *CESifo Economic Studies*, 49(4), pp. 557–579.

Hamoudi, A. A. and Sachs, D.J. (1999). *Economic Consequences of Health Status: A Review of Evidence.* Paper Presented at the Center for International Development, Harvard University.

Hassan, S. and H. Ahmed. (2008). Education's contribution to the economic growth of Sub-Saharan Africa. *Southwestern Economic Review*, 1(32), pp. 175-190.

Harbison, F.H. (1973). *Human Resources as the Wealth of Nations.* New York: Oxford University Press

Hendry, D. (1995). *Dynamic Econometrics: Advance Texts in Econometrics,* Oxford University Press.

Horii, R., A. Kitagawa, and F. Koichi. (2007). Availability of Higher Education and Long-Term Economic Growth, *The Japanese Economic Review* (Online Early Articles). Published article online: 10-Dec-2007.

Husain F. Qasim M. A. Sheikh K. H. (2003). An Analysis of Public Expenditure on Education in Pakistan. *The Pakistan Development Review* 42(4 ii), winter, pp. 771-780

Hitiris, T. and P. John, (1992). "The Determinants and Effects of Health Expenditure in Developed Countries", *Journal of Health Economics* 11, pp.173-181.

Paul, H. and A. King. (1996). "The Determinants of Health Care Expenditure: a cointegration approach", *Journal of Health Economics* 15, pp. 127-137

Igun, S. E. (2006). Human capital for Nigerian Libraries in the 21st Century', *Library of Philosophy and Practice* (e-Journal) 8(2).

Islam, T. S., Wadud, M.A., and Islam, Q. B. T. (2007). Relationship between Education and GDP Growth: A multivariate causality analysis for Bangladesh. *Economics Bulletin*, Volume 3(35), pp. 1-7.

Jamal. H. Ashraf I., and Sami, F. (2003). Privates Returns to Education: Evidence from Pakistan. *State Bank of Pakistan, Research Report No. 50*.

Jamison L. and Wang. (2003). Health's Contribution to Economic Growth in an Environment of Practically Endogenous Retrieved from *www.dcp2.org/file/25/wp10.pdf health*

Johansen, S. & Juselius, K.(1990). Maximum Likelihood Estimation and Inference on Cointegration with applications to the demand for Money. *Oxford Bulletin of Economics and Statistics*, *52*, 169-210.

Johansen, S. (1988). Statistical analysis of cointegration vectors. *Journal of Economic Dynamics and Control*, *12*, 231-254.

Johansen, S. (1991). Estimation and hypothesis testing of cointegration vectors in Gaussian vector autoregressive models. *Econometrica*, *59*, 1551-1580.

Jeffrey,C., Jeffrey,R., and Jeffrey, P. (2004). Degrees Without Freedom: The impact of formal education on Dalit young men in North India, *Development and Change*, 35(5), pp. 963-986.

Jhingan M. L. (2005). The Economics of Development and Planning (38th Edition), *Delhi, India:* Vrinda *Publications (P) Ltd.*

Johnston, J. & John D. (1997.) *Econometric Methods*. New York: McGraw Hill Companies, Inc.

Karagiannis, N. B. (2009). *Differential Impact of Education and Health on Growth: the Greek Evidence.* Center of Planning and Economic Research Amerikis Str, 106 72 Athens Greece.

Khorasgani, M. F. (2008). Higher education development and economic growth in Iran. *Education, Business and Society: Contemporary Middle Eastern Issues*, 1, pp. 162-174.

Khan, A. H. (winter 1997). Education in Pakistan: Fifty years of neglect. *The Pakistan Development Reveiw, 36*(4), pp. 647-667.

Khattah, F. H. (2001). *Economics of Health Sector Reforms in Pakistan* (1st ed.). Islamabad: Ad Rays.

Khattak, F. H. (1996). *Health Economics and Planning in Pakistan.* Islamabad: Ad Rays.

Khan, A. (1996). Policy Making in Pakistan's Population Program. *Health Policy and Planning.*11: pp.30-51.

Khan, A.L. (2005). *Pakistan: Debating Islam and Family Planning.* Conference Paper of the "International Ulama Conference on Population and Development, Islamabad, 4-6 May 2005."

Khan, M.M., Van Dijk, J.P., & Van den Heuvel, W. (2005). The Impact of Economic and Socio-cultural Context upon Health Policy Outcome in Pakistan. *Eastern Mediterranean Health Journal, accepted pending revisions.*

Khan, M. M., & Van den Heuvel, W. (2005). Description and Content Analysis of the National Health Policy of Pakistan. *Asia Pacific Journal of Public Health, accepted pending revisions.*

Khalid, S.M and Khan, M. F. (2006). Pakistan: The State of Education, *The Muslim World,* vol. 96.

Khilji, B. A. (2005). Population Profiles, Human Capital Formation and Economic Development of Pakistan (1951-1998). *Journal of Agriculture and Social Science, 1*(2), pp. 180-186.

Komijani and Memernejad. (2004). Impotence of human capital and R&D in Economic Growth of Iran. *Journal of Research in Economics*, 31.

Klenow, J. J. (1997). *Human Capital Policy.* Chicago University of Chicago.

Lashari, D. T. (2004). *Pakistan's National Health Policy: Quest for a Vision.* Islamabad: The Network Publication.

Lau, L., Jamison, D., Liu, S., and Rivkin, S. (1993). Education and economic Growth: Some cross-sectional evidence from Brazil. *Journal of Development Economics.* 41, pp. 45-70.

Leeuwen B. V. (2007). *Human Capital and Economic Growth in India, Indonesia, and Japan. A Qualitative Analysis* 1890-2000, Doctoral Thesis, Utrecht University. Netherlands.

Lee, M., Liu, B., and Wang, P. (1994). Education, human capital enhancement and economic development: Comparison between Korea and Taiwan. *Economics of Education Review*, 13(4), pp. 275-288.

Loening, J. L. (2005). *Effects of Primary, Secondary and Tertiary Education:* Evidence from Guatemala. Policy Research Working Paper (3610)

Liu, C. and M. Armer. (1993). Education's effect on economic growth in Taiwan. *Comparative Education Review*, Volume 37(3), pp. 304-321.

Lucas, R. (1988). On the Mechanics of Economic Development. *Journal of MonetaryEconomics*, p. 22.

Madsen, j. B., Saxena, Shishir, and Ang James B. (2008). *The Indian Growth Miracle and Endogenous Growth*, Department of Economics Discussion Paper No.17/08, Monish University of Business and Economics.

Maddala, G.S., and Wu, S. (1999). A comparative study of unit root tests with panel data and a new simple test, *Oxford Bulletin of Economics and Statistics*, 61, pp. 631-52.

Malik, G. (2005). An Examination of the Relationship between Health and Economic Growth. *ICRIER working paper no. 185*

Farid. M. F. (2010). *Education and Human Capital Formation in Pakistan.* Retrieved on 10th April 2011. *www.iqraisb.edu.pk/icbte/Proceeding_ICBTE_2010/.../115.pdf*

Khan, M. S. (2005). Human Capital and Economic Growth in Pakistan. *The Pakistan development review 44 part 1 pp. 455-478*

Mustafa, U. Abbas, K., & Saeed, A. (2005). Enhancing Vocational Training for Economic Growth in Pakistan. *The Pakistan Development Review.* 44(4) part ii pp. 567-584

Mankiw, G., D. Romer and D. Weil (1992). "A Contribution to the Empirics of Economic Growth": *Quarterly Journal of Economics* 107, pp 407-37

Mahmood, N. (1999). *Educational Development in Pakistan: Trends, Issues, and Policy Concerns*. Pakistan Institute of Development Economics, Islamabad. (Research Report No. 172.)

Mohamadi, A. (2006). Role of Education in Iran Economic Growth: Fars Province. *Education*, 22(4), pp. 57-84.

MacKinnon. (1991). Critical values for cointegration tests. In: Engle, R., Granger, C. (Eds.), *Long Run Economic Relationships.* Oxford University Press

McMahon, W. (1998). Education and growth in East Asia. *Economics of Education Review.* 17(2), pp. 159-172.

Meer, J., D. Miller and H. Rosen. (2003). Exploring the Health-Wealth Nexus. Working paper no. 9554, National Bureau of Economic Research.

Nazir Z. M, and Nazli H. (2000). Education and Earnings in Pakistan. *Pakistan Institute of Development Economics* Research Report No. 177, Islamabad.

Nakamura J.I. (1981). Human Capital Accumulation in Pre-Modern Rural Japan. *The Journal of Economic History*.14, pp. 263-281

Nishter, S. (2006). *Health System in Pakistan- A Way Forward.* Islamabad Pakistan: Pakistan's Health policy Fourm and heart file.

Nili, M. and S. H. Nafisi. (2003). Relationship between human capital and economic growth. *Quarterly Journal of Economic Researches of Iran*, pp. 17.

Okojie, C.E.E. (1995). Human Capital Formation for Productivity Growth in Nigeria. *Nigerian Economic and Financial Review* 3: December, pp, 71-102.

Ogujiba K. K. and Adeniyi A. O. (2005). 'Economic Growth and Human Capital development; The Case of Nigeria', *Research Paper*.

Olukemi, L. (2009). Human Capital Investment and Economic Development in Nigeria: the Role of Education and Health. Presented at Oxford Business and Economics Conference Program, St, Hugh's College Oxford University, Oxford, UK.

Osipain, A. (2007). *Human capital- Economic Growth nexus in the former Soviet Bloc*. MRPA Paper No.8463

Oyinlola, O.O. and J.A. Adam. (2003). Public Expenditure and Human Development in Nigeria. In.: *Human Resource Development in Africa.* Selected Papers for 2002 NES Annual Conference, Nigerian Economic Society, Ibadan, pp. 53-78

Pakistan, G. o. (2004-05). Pakistan Social and Living Standards Measurement Survey (Round–1), 2004-05. Federal Bureau of Statistics.

Pakistan G. o. (2010). *Pakistan Economic Survey* 2009-2010. Islamabad: *Finance Division, Economic Advisory Wing.*

Pakistan, G. o. (2001–06). *PRSP, Annual Progress Report FY 2001–02, 2002–03, 2003–04, 2004–05, and 2005-06*. Islamabad: PRSP Secretariat, Ministry of Finance.

Pakistan, G. o. (2004-05). Pakistan Social and Living Standards Measurement Survey (Round–1), 2004-05. Federal Bureau of Statistics.

Pakistan, G. o. (2005-06). *Economic Survey of Pakistan (2005–06).*Islamabad: Finance Division, Economic Adviser's Wing.

Planning Commission–UNDP. (2005). *Pakistan Millennium Development Goals Report (PMDGR)*. Islamabad: Centre for Poverty Reduction and Income Distribution (CRPRID).

Pakistan, G. o. (1997). *50 years of Pakistan in Statistics* (Vol. IV). Federal Bureau of Statistics.

Pakistan, G. o. (2008). *Economic Survey* **.** Islamabad: Finance Division Advisiors Wing.

Pakistan, G. o. (1998). *5o Years of Pakistan in Statistics* (Vol. i). Federal Bureau of Statistics.

Pakistan, G. o. (1970). *New Education Policy 1970.* Islamabd: Minstry of Education.

Pakistan, G. o. (2008). *Economic Survey* **.** Islamabad: Finance Division Advisiors Wing.

Pakistan, G. o. (1970-78). *4th Five Year Plan.* Planning Commision.

Pakistan, G. o. (1978-83). *5th Five Year Plan.* Planning Commision .

Pakistan, G. o. (1983-88). *6th Five Year Plan.* Islamabad: Planning Commision.

Pakistan, G. o. (1990). *National Health Policy 1990.* Government of Pakistan.

Pakistan, G. o. (1993-98). *8th Five Year Plan.* Islamabad: Planning Commision.

Pakistan, G. o. (1997). *National Health Policy 1997.* Government of Pakistan.

Pakistan, G. o. (1998-93). *7th Five Year Plan.* Islamabad: Planning Commision

Pakistan, G. o. (2001). *National Health Policy 2001.* Government of Pakistan.

Pakistan, G. o. (2001). *Pakistan Interim Poverty Reduction Strategy Paper (1-PRSP)* **.** Government of Pakistan.

Pakistan, G. o. (2003). *Progress on Agenda for Health Sector Reform.* Government of Pakistan.

Pakistan, G. o. (2009). *National Healht Policy 2009.* Government of Pakistan.

Pakistan G.O. *New Education Policy 1970*. Ministry of Education. Islamabad.

Pakistan G.O. *Education Policy 1972*. Ministry of Education. Islamabad.

Pakistan G. O. *Education Policy 1979*. Ministry of Education. Islamabad.

Pakistan G. O. *Education Policy 1992*. Ministry of Education. Islamabad.

Pakistan G. O. *Education Policy 1998*. Ministry of Education. Islamabad.

Pakistan G. O. *Education Policy 2009*. Ministry of Education. Islamabad.

Pesaran, M. H. & Shin, Y. (1995). An autoregressive distributed lag modeling approach to cointegration analysis. *In Centennial Volume of Ranger Frisch edited by S. Storm, A. Holly and P. Diamond. Cambridge: Cambridge University Press*.

Pesaran, M. H. & Pesaran, B. (1997).*Working with Microfit 4.0*: *Interactive Econometric Analysis*. Oxford: Oxford University Press.

Pesaran, H. M. and Shin, Y. (1999). An Autoregressive Distributed Lag modeling approach to cointegration analysis. In Strom, S. (ed.), *Econometrics and Economic Theory in the 20th Century*: *The Ragnar Frisch Centennial Symposium*. Cambridge: Cambridge University Press.

Pesaran, H. M., Shin, Y and R. J. Smith. (2001). Bounds testing approaches to the analysis of long-run relationships. *Journal of Applied Econometrics*, volume 16, pp. 289-326.

Perron, P.P. (1988) "Trends and Random Walk in Macroeconomic Time Series: Further Evidence and Implications" *Journal of Economic Dynamics and Control,* 12, 297-332.

Philips, P.C.B and Perron, P. (1988). Testing for a unit Root in Time Series Regression, *Bio-Metrika*, 75 pp.335-346

Robert J. Barro and Xavier, Sala-i-Martin (1995). *Economic Growth:* McGraw-Hill

Robert M. S. (1956). A Contribution to the Theory of Economic Growth. *The Quarterly Journal of Economics*, 70, (1). pp. 65-94.

Romer, P. (1986). Increasing Returns and Long-run Growth, *Journal of Political Economy*. 94(5), pp. 1002-37.

Romer, P. (1987). Endogenous technical change. *Journal of Political Economy*, 89, pp. 71-102.

Romer, David (2011). "*The Solow Growth Model*". *Advanced Macroeconomics* (Fourth ed.). New York: McGraw-Hill. pp. 6–48

Renelt, D. and R. Levine. (1992). A sensitivity analysis of cross country growth regressions. *American Economic Review*, 82, pp. 942-963.

Sachs, J.D., & Warner, A.M. (1997). Fundamental Sources of Long Run Growth. *The American Economic Review.* pp. 183-188. Retrieved from *www.uvm.edu/~wgibson/PDF%2520Library on January 30th 2011.*

Saharan, U. (1993). *Research Methods for Business.* New Delhi: Acharia Books.

Saint, W. (2009). *Tertiary education and economic growth in sub-Saharan Africa. The World Bank Report.* Retrieved April 29, 2011, from *www.bc.edu/bc_org/avp/soe/cihe/newsletter/Number 54/p14_saint.htm.*

Sarmad, K. (1989). *The Education Sector of Pakistan.* (Research Report No, 156). Islamabad: PIDE.

Sathar, Z.A. (1997). *Possible Reasons for Retardation in fertility Change in South Asia.* Islamabad: PIDE.

Schultz T. (1961). Investment in Human Capital, *American Economic Review (March), 45(57).*

Schultz, T.W. (1971). *Investment in human capital: The role of education and research.* New York: The Free Press.

Schultz, T.W. (1962). Reflections on Investment in Man. *Journal of Political Economy*, 70, pp. S2-S3.

Schultz, T. Paul (2005). "Productive Benefits of Health: Evidence from Low-Income Countries," Working Papers 903, Economic Growth Center, Yale University

Schultz, T. Paul, 2005. "Productive Benefits of Health: Evidence from Low-Income Countries," IZA Discussion Papers 1482, Institute for the Study of Labor (IZA).

SDIP. (2003). *Social Development in Pakistan: state of Education.* Oxford University Press. Social Policy and Development Center, Karachi.

Seebens, H. and P. Wobst. (2003). *The Impact of Increased School Enrollment on Economic Growth in Tanzania*. Bonn: Center for Development Research.

Sharma, R. K., Satish-K. M. and Meher, S. (2002). Education,Skills,and the Labor Market in a Globalised World: A Case of India. *Indian Journal of Labor Economics*, 45(4), pp.1129-1147.

Siddiqui, R., U. Afridi, and R. Haq. (1995). Determinants of Expenditure on Health in Pakistan. *The Pakistan Development Review* 34(4), pp. 959-970

Solow, R. M. (1956). A Contribution to the Theory of Economic Growth. *Quarterly Journal of Economics*, Volume 70, pp. 65-95.

Solow, R. M. (1957). Technical change and the aggregate production function, *Review of Economics and Statistics*, vol. 39, pp. 312–320.

State Bank of Pakistan. (2005). *Handbook of Statistics on Pakistan Economy. Karachi*: State Bank of Pakistan.

Swada, Y. (1997). *Human capital Investment in Pakistan, Implications of Micro-Evidence from rural Pakistan.* Islamabad: PIDE.

Swan, Trevor W. (1956). "Economic Growth and Capital Accumulation". *Economic Record* 32 (2): 334–361.

Tilak, J. B. G. (1994). *Education for Development in Asia*. Sage Publications.

Tilak, J. B. G. (2005). Post-elementary education, poverty and development in India. Post-Basic Education and Training *Working Paper Series No. 6,* Centre of African Studies, University of Edinburgh.

Tilak, J.B.G. (2002). Household Expenditure on Elementary Education in Rural India: A Few stylised Facts. *Indian Journal of Social Development*, 2(2), pp. 231-267.

Todaro M. P. and Smith S. C. (2003). *Economic Development* (8th Editions), *Pearson Education (Singapore) Pte Ltd, Delhi, India.*

Toda, H. Y. & Yamamoto T. (1995). Statistical Inference in vector autoregressive with possible integrated processes. *Journal of Econometrics*, *66*, 225-250.

Toor, I. A., and M. S. Butt. (2005). Determinants of Health Expenditure in Pakistan. *Pakistan Economic and Social Review* 43:1, 133–150.

Uwatt, B. U. (2002). Human Resource Development and Economic Growth in Nigeria, 1960-2000. *Proceeding of the Annual Conference of the Nigerian Economic Society:* Human Resources Development in Africa, University of Ibadan.

Voon, J.P. (2001). Measuring Social Returns to Higher Education Investment in Hong Kong: Production Function Approach, *Economics of Education Review*, 20(5), pp. 503–10.

Waheed, F. S. (January 2001). Human Capital and Economic Growth: Time Series Evidencefrom Pakistan . *Pakistan Business Reveiw*.

Wang, Y. and Yao, Y. (2001). *Sources of China's Economic Growth 1952-1999: incorporating Human Capital Accumulation.* The World Bank, Working paper 2650.

Weale, P. S. (2003). *Education and Economic Growth.* Dean Trench street Londan: National Institute of Economic and Social research.

Weil, D. N. (2005). Accounting for the effect of Health on Economic Growth*. NBER Working Paper No. 11455*

World Bank. (2006). Pakistan: An Assessment of The Medium-Term Development Framework, Higher Education Policy Note, Report No. 37247, Human Development Sector, South Asia Region.

World Bank. (1997). *Pakistan - Towards A Health Sector Strategy*. Washington DC: Health, Nutrition and Population Unit, South Asia Region,

World Development Report. (1995).

World Development Report. (2007).

World Health Organization. (1978). *Declaration of Alma Ata.* Geneva: WHO.

World Health Organization. (1988). The Challenge of Implementation: district health system for primary health care. Geneva: WHO

WHO. (2001). *Macroeconomics and health, Investing in Health for Economic Development.* Geneva Switzerland: WHO.

White, H. (1980). "A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity". *Econometrica* 48 (4): 817–838. JSTOR 1912934. MR 575027.

Xiao, Z. (2001). Testing the null Hypothesis of Stationarity against an Autoregressive Unit Root Alternative. *Journal of Time Series Analysis* 22, 87–105.

Xiao, Z. Phillips, P.C.B. (1998). A CUSUM test for Cointegration Using Regression Residuals. *Working Paper*, University of Illinois.

Yasuyuki, S. (1997). Human Capital Investment in Pakistan: Implications of Micro Evidence from Rural Household. *The Pakistan Development Review,* 36, 4 part (ii) pp. 695-712

Zon, A. v., & Muysken, J. (2001). Health and endogenous growth. *Journal of Health Economics, 169–185.*

http://www.unescap.org/esid/hds/health/Link_health_economic_growth.pdf

Appendix-A

SOCIAL ACTION PROGRAM

Social Action Programme (here after SAP) is a national programme, launched with active participation of the Federal and Provincial Governments, Non-governmental Organizations (NGOs), private sector and communities. It is a response to the realization that the past investments in the social sectors have yielded significantly less than desirable results and that social development did not match the respectable growth of above 6 percent that the country had achieved in the economic field.

SAP enshrines the concern the Government has for the rural/poor, the disadvantaged and marginalized people of the country. It aims at helping reduce poverty, improve well-being of the people and decelerate population growth. It comprises Government effort to strengthen basic social services through primary education, primary health care, family planning, and rural water supply and sanitation. The Government fully realizes that Pakistan's weak social services and higher population growth of about 3% per annum are undermining the country's development efforts and impeding the quality of life. Educational attainments and health indicators, especially for women, fall short of the countries of similar income levels.

SAP focuses on the most vulnerable or marginalized groups of society, such as, the rural poor and women through emphasis on girls' enrolment at the primary level and recruitment of a larger number of women as teachers and learning coordinators. The school enrolment is planned to be increased to bring basic education up to minimum quality standards. It will also strengthen the primary health care system and sharply expand family planning services. Finally, the SAP will increase the area served by rural water supply and sanitation facilities and associate communities in the planning, designing, implementation, monitoring and maintenance of these services.

The concept is not merely to construct new facilities but also to involve communities and people in the system to ensure sustained and improved

service delivery. The SAP strategy to accelerate pace of social development includes:

i) Ensuring adequate financial allocations (development and recurrent).
ii) Improving delivery of social services.
iii) Strengthening institutional mechanisms.
iv) Facilitating NGOs and community participation.

SAP emphasizes implementation through policy dialogue and close coordination among concerned agencies. Disbursements of funds to executing agencies are made after annual assessments by the donors and government authorities responsible for that year's operational plans. The operational plans include development budgets and current budget as well as implementation plans that specify both prior actions and measurable targets for each sector. Donors reimburse a share of the expenditure for agreed programmes i.e. about 25% by foreign donors and 75% through national resources.

4.4.6.1 Selection Criteria

The approved criterion for identification of SAP schemes is as under:

a) Primary Education

Site selection for primary schools should be based on scientific criteria using school mapping and Education Management Information System (EMIS) data. Primary schools will be established in those areas where population of school age (boys or girls) is at least 80, the total population of catchment area is at least 1000 and that a middle/primary school does not exist within a radius of 1.5 KM of the proposed site of a primary school. Wherever possible, two kanal land is to be made available free of cost. He land should be suitably located and technically acceptable. If free land is not available for school within the acceptable vicinity, the government will acquire it.

b) Primary Health Care

Each Provincial Government has its own criteria for selection of sites for Basic Health Units (BHUs) and Rural Health Centers (RHCs). In general, they follow the following conditions: one BHU serves cluster of villages in a Union Council, and a village is selected for location of BHU if it has:

i) road/train access,

ii) Electricity,

iii) Post office,

iv) Availability of water supply source,

v) Population coverage within a radius of 8-10 KM must be at least 5000-10,000 (the minimum population of village of location should not be less than 1000),

vi) Primary education facility for girls, and

vii) Accessibility for population cluster, ideally central location to cover the cluster of villages. For Rural Health Center (RHC), telephone connection is also a pre-requisite condition. Initially, land donation from the community was required. This is no more a condition, as often the land was not in the best location._ Therefore, purchase of land is allowed, provided other conditions are met.

c) Rural Water Supply & Sanitation (RWSS)

The basic criteria for the selection of a rural water supply and sanitation scheme is that the initial proposal for the construction of the facilities should come from the beneficiaries. After the proposals are received from the community, the line departments will carry out a technical and financial feasibility of the proposal on the basis of present facilities, coverage, availability of source and willingness to bear the O&M cost by the beneficiaries. The community would then be provided with options in terms of quantity of water to be supplied, the daily hours of supply, and the type of service. The community has to decide whether they will choose community taps for the service or would like to have house connections. These options would decide the operational cost of the system. The system finally built would be that which is within the financial capability of the community to operate and maintain with their own resources. Effort will be made to replicate cheaper appropriate technology to reduce cost of maintenance to the community. Community management and participation to undertake O&M cost of the completed rural water supply scheme is essential. Besides, a unified policy for

cost recovery, tariff and Operate & Manage costs is to be adopted for rural water supply schemes.

Appendix-B

Medium Term Development Framework for Education

MTDF plans to achieve the targets set under the Millennium Development Goals (MDGs) for Universal Primary Education (UPE), literacy, and promotion of gender equality and empowerment (Gender Parity Index, GPI).

Past experience indicates that programmes must be need based, specific, implementable, target /result oriented, measurable, and time specific. While revision and up-gradation of curricula, and infrastructure in existing institutions will continue to be a key activity at all levels, it is planned to raise the internal and external efficiencies of the entire educational system during MTDF 2005-10.

Schools and Literacy

The Government is fully committed to Universal Primary Education (UPE) by 2010 and the Education for All (EFA) up to 2015 to meet the Dakar Goals and MDGs. To achieve this end, Primary Education will be made compulsory through enactment on the one hand and provision of free text books at primary level. Further, Katchi classes are planned to be introduced in all primary schools in rural areas to enhance participation. The MTDF envisages 30,000 additional primary schools in the country. Other key strategies will include free education up to matriculation (grade 10) / secondary school level, induction of vocational / technical streams in 2000 secondary schools, and provision of science laboratories and computer education in every school. Shifting of classes XI-XII from colleges to 2000 secondary schools, and development of counseling system as a pilot project in major cities, to be later implemented in all schools, will also be initiated.

Gender Disparities: Meeting MDGs

All primary schools will be converted to co-educational schools, and all primary schools will, move towards the goal of 100 percent female teachers, as per the policy of the government, which has been found most conducive in girls' enrollment and retention in rural areas. Further reduction of gender gaps in enrollment and retention, will be enabled through financial and nutritional

incentives to girl students, especially in rural areas. Finally, special financial incentives will be provided to attract and retain female teachers in rural areas.

Technical, Vocational, and Scientific Education

A major skill based programme for the potential age group 15-24 years, will be launched which will enable alternative pathways through schools and colleges. This will be done through provision of science laboratories and computer education in every school to help balance the ratio between Arts and Science streams, and introduction of technology education / technical stream as a core subject at secondary level. Finally major focus will be on teacher training for science laboratories and technical streams in schools.

Qualifications and Capacity Building of Teachers

The minimum qualification for all school teachers will be raised to a Bachelor's degree with professional teacher's training and teacher emoluments will be increased. Teacher training institutes will be decentralized up to the district level to meet local requirements and institution based recruitment policy, and Provincial Councils of Teachers Licensing and Accreditation to register professional teaches will be put in place to monitor and help prepare their lifelong professional development.

Madrassa Education

It is proposed to mainstream 8000 Madrassas with a view to bring them in line with national standards and accreditation, especially as regards technical and vocational skills. Several actions are proposed such as introduction of Mathematics, Social / Pakistan Studies, Computer Science and English language in all Madaris, and induction of teachers for these subjects. Emoluments to Madrassa teachers will be increased, and policies for provision of alternative pathways for Madrassa students to join the educational mainstream at the post school levels will be adopted.

College Education

Higher education reforms will not be complete without reforms in college education, It is necessary first to separate the Intermediate stream from degree colleges, because it reduces the efficacy of Bachelor's level education, and

secondly, introduce the 4 year stream in degree colleges. Initially 300 existing degree colleges will be upgraded by providing major inputs in the form of funds for infrastructure enhancement, teaching tools, libraries, and capacity building of teachers.

It is proposed to establish 100 new degree colleges, with 4 year stream, and expand the programmes offered to include economically relevant courses, especially for professional courses which are of short / medium term duration (6 – 12 months). Finally it is planned to provide autonomy to colleges, with Board of Governors / Trustees drawn from local community, academia and business.

Data Collection and Analysis

Administrative data and statistics on Education Management Information System (EMIS) needs to be supplemented by data from other independent surveys such as Pakistan Integrated Household Surveys (PIHS), to increase its credibility and validity. The issue of differing definitions, dis-aggregation and analysis, more frequent updates and publication, and quality of collection, will be streamlined during the period 2005-10 to bring the activity in line with international standards. Administrative entities such as the Federal Bureau of Statistics (FBS) or EMIS at provincial and federal levels will be strengthened through capacity enhancement.

Because of devolution, the quality of data will ultimately be the responsibility of District Governments. A concerted effort will be made to substantially expand capacity of district governments in this regard. One important tool could be greater use of Urdu in IT at the District level. Work is underway towards English-Urdu online translator, Urdu e-mails, and Urdu Web pages.

Medium Term Development Framework for Health

The first Medium Term Development Framework (MTDF), 2005-10 provides guidelines to ensure equitable development in all the regions of Pakistan, having fully integrated economy with a sense of common and shared destiny.

The MTDF acknowledges the MDG targets and puts emphasis to continue and strengthen the shift from curative services to preventive, promotive and primary health care. Moreover, MTDF also addresses the issues of health care financing, health insurance and employees' social security, and public private partnerships in the health sector.

The MTDF also presents the health system in Pakistan at federal, provincial and district levels (under public health services) and private health services. Ministry of health at the federal level and health departments at the provincial levels are responsible for public health service delivery in Pakistan. The public provision of medical and health services compromises of primary, secondary and tertiary health care facilities. Primary health care facilities mainly look after out-door patients. These facilities include: rural health centers, basic health units, primary health care centers, dispensaries, first aid posts, mother and child health centers, and lady health workers. Secondary health care services look after out-door patients as well as indoor patients. District and tehsil headquarter hospitals are the secondary health care establishments; each district and tehsil must have this facility. Tertiary health care facilities are mainly present in major cities only. These facilities are affiliated with research and teaching organizations. Both the secondary and tertiary health care services are 24 hours operation. MTDF also gives the recent figures underlining health workers and facilities in Pakistan. Table 1 shows the national medical and health establishments between 1990-91 and 2005-06. It shows that numbers under each health establishment are increasing, however, due to increasing population growth the number of persons per bed is also increasing.

Table # 1 National Medical and Health Establishments

Year	Hospitals	Dispensaries	BHUs	MCHCs	RHCs	TB Centers	Total Beds	Population per Bed
1991	776	3993	4414	1057	465	219	75805	1461
2000	876	4635	5171	856	531	274	93907	1495
2001	907	4625	5230	879	541	272	97945	1490
2002	906	4590	5308	862	550	285	98264	1517
2003	906	4554	5290	907	552	289	98684	1536
2004	916	4582	5301	906	552	289	99908	1540
2005	919	4632	5334	907	556	289	101490	1530

Source: Economic Survey of Pakistan (2005-06).

MTDF highlights following major issues in the health service provision, facing Pakistan:

1. Organizational Issues

(a) In-adequacies in Primary/Secondary Health care Services

(b) Urban/rural imbalances

(c) Professional and Managerial deficiencies in District Health System

(d) Gender equity

(e) Unregulated Private Sector

2. Burden of Disease (BOD)

(a) Widespread prevalence of communicable diseases

(b) Basic nutrition gaps in the target population

(c) Addiction and Mental Health

3. Deficient Health Education System

Realizing these challenges and limitations, the MTDF envisages a sound health care system practicing a healthy lifestyle, in partnership with the private sector including civil society, which is effective, efficient and responsive to the health, needs of lower socioeconomic groups especially women in the reproductive age. The MTDF Health sector strategy focuses on: primary health care in rural areas and urban slums; vertical programmes, training and re-

training of medical staff; subsidization of health services for the poor segments; regulation of private sector; and health education through skill development of health staff in communication techniques at all levels. Parallel to the MTDF, a project on Medium Term Budgetary Framework (MTBF) has also been started with the ministry of finance in collaboration with the UK—Department for International Development (DFID). MTBF will provide budgetary guidelines to the finance departments.

Appendix-C

Millennium Development Goals (MDGs)

Social Action Program was followed by a huge program launched by the UN and other international agencies in 2000, was the Millennium Development Goals (henceforth MDG). MDGs are designed for a measurable reduction in poverty and marked improvement in the health of the poor. Basically the agenda of MDG is a development agenda, which includes quantitative goals; time bound targets and numerical indicators.

189 world leaders agreed upon these eight MDG goals at the Millennium Summit 2000, these goals are as under,

i) Eradicate extreme poverty and hunger,
ii) Achieve Universal Primary Education,
iii) Promote gender equality and empower women,
iv) Reduce Child Mortality,
v) Improve Maternal Health,
vi) Combat HIV/AIDS, malaria and other diseases,
vii) Ensure environmental sustainability,
viii) Develop a global partnership for development.

In order to achieve these goals, the year 2015 has been fixed as a target meeting year. While 1990 has been set as baseline. To meet the MDGs, 18 targets and 48 indicators have been set.

Pakistan is a signatory to the MDGs. Of eight stated goals and 18 targets to be achieved by the year 2015, of these six are related to health. MDGs have very important policy implications as Pakistan will have to enhance financial as well as implementation capacities to meet the targets.

Table # 1

MDGs Health Targets in Pakistan

Indicators	1990	MDGs targets up to 2015
Reduce Child Mortality		
Under five mortality rate (/1000 live births)	140	47
Infant mortality rate (/1000 live births)	120	40
Proportion of fully immunized children (12-23 months) (%)	25	>90
Improved Maternal Health		
Maternal Mortality Ratio (/100,000 live births)	550	140
Births attended by skilled birth attendant (%)	N/A	90
Contraceptive Prevalence (%)	12	55

Source: *Progress on Agenda for Health Sector Reforms May 2003 Ministry Of Health*

(> means more than)

Primary school targets for Pakistan

Table # 2

MDG targets for Universal Primary Education

Indicators	1990	MDG Targets 2015
Net Primary Enrollment ratio (%)	46	100
Completion survival rate 1 grade to5 (%)	50	100
Literacy rate (%)	35	88

Source: *Ministry of Education 2003*

(Definition of variables:
Net Primary Enrollment ratio: Number of children aged 5-9 years attending primary level i.e. 1-5 grade, divided by the total number of children aged 5-9 years multiplied by 100.
Complete survival rate: proportion of students who complete their studies from 1 to grade 5.
Literacy rate: proportion of people aged 10 years, who can read and write with understanding.)