Chapter: 5

Planning for Human Development

Is the objective of development just to produce more "stuff", more goods and more services, irrespective of who have the access to these goods and services and who do not have? Or, are these goods and services produced ignoring the quality of human life?

People are the real wealth of nations. Hence, human development is about much more than economic growth, which is only an important means of enlarging people's choices. It is thus about expanding the choices of people and creating an environment in which people can develop their full potential and lead productive, creative lives in accord with their needs and interests [HDR, 2001].

Human development or human capital formation is regarded as the precondition for economic growth. It is a process of increasing skills, knowledge and capabilities of the population of a country [Harbison and Myres, 1970], which involves investment in human beings in the form of formal and non formal education, training, health and sanitation programs, etc. [Schultz, 1970].

Thus, the objective of development should be to enrich human lives by increasing the capabilities of people to lead full, productive, satisfying lives. Perhaps, this does not mean to ignore or neglect the significant role of increased production in development or in increasing the capabilities of people, but what it implies is that increased output should be seen as an intermediate product, which under appropriate circumstances would enhance human well being.

"Human development and improvement in quality of life are the ultimate objectives of all planning. This is to be achieved through policies and programs aimed at promotion of both equity and excellence, taking into account the resources required for human development and human resources available for carrying out the plan" [HDR, 1999].

Human development cannot be achieved overnight, but it needs a continuous planned efforts and resources to be achieved. In Chapter: 2 of this research work, we have studied the status of human resources in Eritrea from all its aspects and have seen the alarming conditions as indicated by the poor quality of health, high child mortality rates, short span of life expectancy at birth and the low rates of adult literacy and school enrolment ratios. In Chapter: 3, we have analyzed the growth in the Eritrean economy and its sectors and revealed the poor economic situation with its low growth rates

In continuation to these chapters, the present Chapter attempts to address the problems of human development in Eritrea in relation to economic development, with the universal approach introduced by the United Nations Development Program [UNDP]. It also takes this issue a step further by estimating the future HDI targets for Eritrea, linking human development to government expenditure in the social sector; and by analyzing the causal relation between economic growth and human development. The present Chapter covers the following important points:

5.1 Human Development

5.2 Social Expenditures and Human Development

5.3 Interrelationship Between Economic Growth and Human Development

5.1 Human Development

Human resource is the most important factor in the economy because human beings are not instruments of production or consumption but ends in themselves. The Human Development Report [1996], published by the UNDP states, "Human Development is the end, economic growth a means" [HDR, 1996].

Human development is defined as a process of enlarging people's choice. Though, in reality, human choices are infinite and ever changing. The three important choices for people at all levels of development are: [i] to lead a long and healthy life, [ii] to acquire knowledge, and [iii] to have access to the resources needed for a decent standard of living. The availability of these essential choices is regarded as the key to access to many other opportunities [HDR, 1995].

The concepts of GDP and GNP per capita were, up to the end of the 1980s, virtually unchallenged as practical measures of the level of economic well being, economic progress and the development of a country and its people. The GDP and GNP exclusively rely on monetary and market transactions as their basis for measuring national material wealth and income. It later became evident that GDP and GNP measures basically ignored the roles of *social structure and habitat* [environment and natural resources] in producing economic well being and development in a society. This occurs because for different reasons neither of these two fundamental dimensions of society is "valued" in the market place.

To overcome the limitations of GDP and GNP and to monitor progress in human development, a simple measure of development was needed. Accordingly, in this effort, the United Nations Development Programme [UNDP] introduced the concept of *human development* in its first Human Development Report. This concept stressed that the purpose of economic development was to create an environment where people's choices are enlarged and where they can exercise these to enjoy long, healthy and creative lives [HDR, 1990].

The concept of human development is much deeper and richer than what can be captured in any composite index or even by a detailed set of statistical indicators. Yet, in order to

quantify this idea of economic progress, the UNDP introduced the Human Development Index [HDI] as a superior measure of economic progress than either the GDP or GNP per capita. The HDI was introduced as a measure for human development on the reasoning that the real wealth of a nation is its people and therefore one must link people and development [Chelliah and Shanmugam, 2002].

The HDI seeks to measure the uses of wealth and for these purposes combines three sets of indicators:

1. Life expectancy at birth – representing a long and healthy life,
2. Educational attainment – representing knowledge which constitutes adult literacy and gross enrolment ratio,
3. Real per capita income in purchasing power parity dollars – representing a decent standard of living

In subsequent Human Development Reports, both; the concept of human development and the measurement of the HDI have been further developed. However, in 1999, the methodologies as well as concepts of the human development index were significantly refined. Presently, the HDI is considered as an advanced and composite tool which measures the average achievements in the most basic human capabilities, relating to the above three factors.

Since 1990, the UNDP has been publishing the HDI for the countries of the world who have available data. Moreover, since the introduction of HDI, the UNDP has introduced a series of other human development indices namely, the Gender-related Development Index [GDI], the Gender Empowerment Measure [GEM], the Human Poverty Index [HPI] and the Technology Achievement Index [TAI].

The human development approach does not replace one aggregate statistics i.e. GNP by another aggregate statistics i.e. HDI and then seek to maximize the numerical value of the replacement. Rather, it views the objective of development as inherently multi-dimensional. There are numerous constituents of a person's [or a society's] well being and in assessing progress towards development it is necessary to assess the constituent elements. This approach puts *new and heavy* demands on the statistical services – *new,* because most statistical bureaus have concentrated their efforts on collecting production,

expenditure and income data for the conventional national accounting framework and *heavy,* because the desired degree of disaggregating implied by the alternative framework is high [Griffen and McKinley, 1992].

Putting people first implies making their status a measure of development. The assessment of growth from the point of view of human development and well-being is reflected in the ability of people to lead a long life, to enjoy good health, to have access to the stock of the accumulated knowledge, to have sufficient income to buy food, clothing and shelter, to participate in the decisions that directly affect their lives and their community and so on.

a. Objectives

The objective of this study is to estimate Eritrea's HDI for all the years of post-independence era and then evaluate the human development performance. There are two reasons to carry out this exercise. First, the UNDP report on Human Development has not given the estimation for Eritrea on a regular basis, perhaps due to the lack of data availability. Second, as has been mentioned earlier, the methodologies as well as concepts of the human development index were significantly refined in 1999. Prior to that, all the HDI reports were constructed on the basis of the old concepts. Hence, they neither permit inter-country comparison, nor a comparison within the same country at different points of time.

The main objectives of this study are:

1. Estimation of human development index for Eritrea for the post independence period [1992 – 2000], using the modified methodologies and concepts of the human development index,
2. Assessment of human development status in the post independence period,
3. HDI comparison of Eritrea with specified regions and group nations,
4. Future target estimations of Eritrea's HDI.

b. Methodology

The study has been carried in two parts as given below:

b.1 The estimation and assessment of HDI

This includes the following steps:

i. Identification of human development *indicators and goal posts,*
ii. Estimation of human development *dimension indices,*
iii. The estimation of *human development index,*

b.2 The estimation of future HDI Targets

This includes the following steps:

i. Estimation of expected growth in human development indicators,
ii. Estimation of future human development indicators,
iii. Estimation of future human development dimension indices,
iv. Estimation of future human development index [HDI].

i. Identification of Human Development Indicators and Goal Posts

The HDI is based on four indicators related to health, education and economy. These indicators are: life expectancy at birth, adult literacy rate, gross enrolment ratio and real GDP per capita measured in PPP US $.

For the construction of the HDI, the UNDP has assigned specific fixed minimum and maximum values [goalposts] for each of the underlying indicators [HDR, 2000]. Table: 1 below illustrates the goalposts for calculating the HDI.

Table: 1 Goalposts for Calculating the HDI		
Indicators	Maximum Values	Minimum Values
Life expectancy at birth [years]	85	25
Adult literacy rate [%]	100	0
Combined gross enrolment ratio [%]	100	0
GDP per capita [PPP US$]	40,000	100

ii. Estimation of dimension indices

Before the HDI itself is calculated, on the basis of the goal post values, a dimension index is computed for each of the three dimensions – life expectancy, educational attainment and per capita income. The dimension index for a component of the HDI individual indices is computed as the difference between the actual and minimum goal post values of the variable divided by the difference between the maximum and minimum goal post values. The performance in each dimension is expressed as a value between 0 and 1.

$$\textit{Dimension Index} = \frac{\textit{[actual value of the variable - minimum goal post value]}}{\textit{[maximum goal post value – minimum goal post value]}}$$

Using the assigned goalposts for each of the underlying indicators from Table: 1, the dimension indices for each of the human development indicators are estimated using the following method:

Life Expectancy Index: The life expectancy index measures the relative achievement of a country in life expectancy at birth. It is calculated by dividing the difference between actual and minimum life expectancy values over the difference between maximum and minimum life expectancy values.

$$\textit{Life Expectancy Index} = \frac{\textit{actual value of life expectancy} - 25}{85 - 25}$$

Educational Index: The educational index measures the relative achievement of a country in both adult literacy and combined primary, secondary and tertiary gross enrolment. First, an index for adult literacy and another for combined gross enrolment are computed. Then the educational attainment index is computed by a combination of two-thirds of adult literacy index and one-third of combined gross enrolment index.

$$\textit{Education Index} = \textit{2/3 [Adult literacy index]} + \textit{1/3 [Gross enrolment index]}$$

Where:

$$\textit{Adult literacy Index} = \frac{\textit{actual value of adult literacy} - 0}{100 - 0}$$

$$\textit{Gross Enrolment Index} = \frac{\textit{actual value of Gross enrolment} - 0}{100 - 0}$$

GDP Index: The GDP index is calculated using adjusted GDP per capita [PPP US$]. In the HDI, income acts as a surrogate measure for all the dimensions of human development not reflected in a long and healthy life and in knowledge. Income is adjusted because achieving a respectable level of human development does not require unlimited income. The GDP index is computed on the basis of Anand and Sen [1999] study which uses the following formula:

$$\textit{GDP Index} = \frac{\log[\textit{actual value of GDP}] - \log[100]}{\log[40{,}000] - \log[100]}$$

iii. The Estimation of Human Development Index [HDI]

Having constructed all the dimension indices required, the human development index can be computed as a simple average of all the three component indices. That is; the total sum of the three indices divided by three.

$$\textit{HDI} = \frac{[\textit{life expectancy index}] + [\textit{education index}] + [\textit{GDP index}]}{3}$$

In terms of human development, the UNDP classifies all countries into three clusters by achievement in human development:

- High human development [*HDI value 0.800 or above*],
- Medium human development [*HDI value 0.500 – 0.799*],
- Low human development [*HDI value less than 0.500*].

c. Data Source and Time Period

In order to accomplish this task, we need to know all the necessary indices and components required to measure human development i.e. the components of HDI, such as: life expectancy at birth, adult literacy rate, and gross enrolment ratio. We have already discussed behavior of these variables in Eritrea in Chapter: 2 of this study.

The estimation of HDI and all the required dimension indices is carried out for the post independence era [1992 –2000]. Further, on the basies of these estimates, the HDI and its dimension indices have been forecasted for three phases covering the period 2001 to 2015.

d. Empirical Results and Analysis

i. Empirical Results

Table: 2 shows the data on human development indicators in Eritrea for the period 1992 to 2000. On the basis of these indicators the dimension index has been calculated for each indicator. The result of the estimated dimension indices for Eritrea for the period 1992 – 2000 is given in Table: 3.

Further, using the dimension indices from Table: 3, the estimated of human development index for Eritrea has been estimated for the post independence period [1992-2000]. The HDI trends and values are presented in Table: 4 and Chart: 1.

ii. Analysis

1. Health, education and income levels influence the human development level. The assessment of the pattern of human development in Eritrea from 1992 to 2000 shows a very poor performance in terms of human development index [HDI]. This poor performance reflects the poor status of life expectancy, adult literacy rate, gross enrolment ratio and per capita GDP in Eritrea.

2. As it is evident from Chart: 1, there has been a meager improvement in Eritrea's HDI value from 0.383 in 1992 to 0.421 in 2000. In terms of human development Eritrea ranks among the lowest countries of the world. In fact, in terms of HDI rank, Eritrea occupied the 157^{th} position out of 173 countries in the year 2000.

3. The values of the individual HDI indicators reflect the poor status of health, education and economy in the country. As can be seen from Table: 2, though the life expectancy at birth in Eritrea has improved from 49.8 years in 1992 to 52 years in 2000, still the value of the life expectancy index has been very low at 0.45 in the year 2000.

4. Adult literacy rate improved significantly from 48.3 percent in 1992 to 55.7 percent in 2000. However, the performance of gross enrolment ratio has been extremely poor. It has increased from 25 percent in 1992 to 29 percent in 1995 and ended up declining to 26 percent in the year 2000. Perhaps this resulted in the poor value of education index throughout 1992 to 2000.

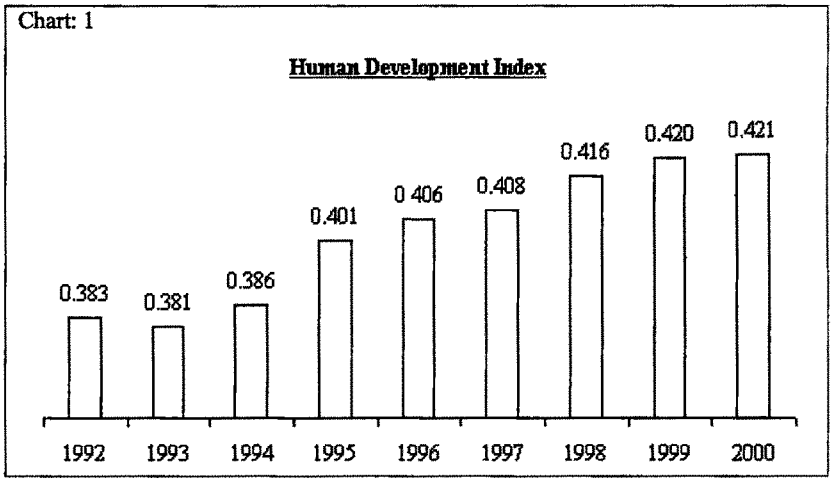
5. The per capita GDP reflects the standard of living in Eritrea. Though the per capita GDP has increased from US $ PPP 726 in 1992 to US $ PPP 837 in 2000, still in terms of standard of living, Eritrea is among the poorest nations. In terms of GDP index value, Eritrea remained almost stagnant in the range 0.32 to 0.35 throughout the period of study from 1992 to 2000.

Table: 2 Human Development Indicators				
Years	Life expectancy [Years]	Adult literacy rate	Gross enrolment ratio	GDP Per Capita [PPP $]
1992	49.8	48.3	25	726.0
1993	49.9	49.2	24	682.0
1994	50.1	50.1	24	702.0
1995	50.2	51.1	29	789.0
1996	50.5	52.0	28	826.0
1997	50.8	52.9	27	821.0
1998	51.1	54.0	27	883.0
1999	51.8	54.8	26	874.0
2000	52.0	55.7	26	837.0

Table: 3 Human Development Dimension Indices			
Years	Life expectancy Index	Educational Index	GDP Index
1992	0.41	0.41	0.33
1993	0.42	0.41	0.32
1994	0.42	0.41	0.33
1995	0.42	0.44	0.35
1996	0.43	0.44	0.35
1997	0.43	0.44	0.35
1998	0.44	0.45	0.36
1999	0.45	0.45	0.36
2000	0.45	0.46	0.35

Table: 4	Human Development Index								
Years	1992	1993	1994	1995	1996	1997	1998	1999	2000
HDI Values	0.383	0.381	0.386	0.401	0.406	0.408	0.416	0.420	0.421

Chart: 1



e. HDI Comparison of Eritrea with Specified Regions and Groups

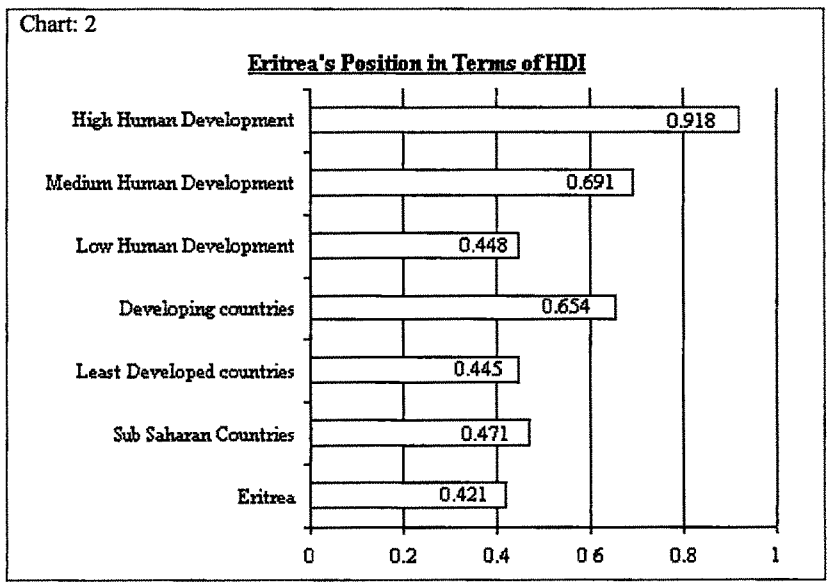
The assessment of Eritrea's HDI would not be complete unless it is evaluated with respect to the region where Eritrea lies, with respect to the groups to whom Eritrea economically belongs and also, with respect to the nations with high levels of human development.

Table: 5 below shows the figures of HDI and its components for Eritrea and the mentioned regions and groups for the year 2000. Further, Chart: 2 illustrate graphically the gap in HDI values between Eritrea and respective regions and nation groups.

As it is clear from Chart: 2, Eritrea's HDI value of 0.421 lies slightly below the HDI value in least developed countries, which is 0.445. It is far below the HDI values in Sub-Saharan countries, developing countries and medium human development countries, which have HDI values of 0.471, 0.654 and 0.691 respectively.

Table: 5 HDI Comparison of Eritrea with Specified Regions and Groups				
	HDI Index	Life expectancy index	Education Index	GDP Index
Eritrea	**0.421**	**0.45**	**0.46**	**0.35**
Sub Saharan Countries	0.471	0.40	0.55	0.47
Least Developed countries	0.445	0.45	0.48	0.41
Developing countries	0.654	0.66	0.69	0.61
UNDP Classification				
Low Human Development	0.448	0.46	0.46	0.42
Medium Human Development	0.691	0.70	0.75	0.62
High Human Development	0.918	0.87	0.96	0.92

Chart: 2



f. Estimation of Future HDI Targets

The improvement of human development is a long process, which cannot be achieved overnight. The UNDP, in its millennium agenda for human development, indicated certain targets to be achieved by all developing countries by the year 2015 [See Box: 1].

On the basis of Eritrea's past performance in human development and considering its potentiality and limitations, the important questions raised are: *What level of human development Eritrea would be able to achieve by the year 2015? Will Eritrea be able to match the UNDP millennium targets for life expectancy, adult literacy rate and gross enrolment ratio? Will Eritrea be able to catch up with the standard of developing countries in terms of human development index?* This topic attempts to address all these important questions.

i. Estimation of Expected Growth in Human Development Indicators

From the assessment of human development indicators, it has been observed that the performance of Eritrea in HDI has been dismal. This dismal performance reflects the poor status of the HDI indicators. Therefore, to estimate the expected growth in the HDI indicators, we applied a realistic minor shock to each indicator on the basis of its past performance.

Life expectancy at birth in Eritrea in the last eight years has improved by 4.4 percent, from 49.8 years in 1992 to 52.0 years in 2000, an annual growth of 0.48 percent. Normally, the improvement in life expectancy at birth occurs slowly and takes a long period. Let us assume the growth in life expectancy to improve marginally from its past trend of 4.4 to 5.0 percent [a rise of just 0.12 percent per annum] in the next five years from 2000 to 2005. And then after, to 6.0 percent from 2005 to 2010 [improvement by 0.2 percent per annum] and finally 7.0 percent [improvement by 0.2 percent per annum] from 2010 to 2015. It seems to be a quite realistic assumption.

Box: 1

The Millennium Declaration's Goals for Development and Poverty Eradication

As the world entered the new millennium, heads of state and government gathered at the United Nations General Assembly to lay out their vision for the world. The leaders of the summit adopted the United Nations Millennium Declaration, recognizing their "collective responsibility to uphold the principles of human dignity, equality and equity at the global level". Among the many objectives set out by the declaration are specific, quantified and monitor able goals for development and poverty eradication by 2015:

- To halve the proportion of the world's people living on less than $1 a day.
- To halve the proportion of the world's people suffering from hunger.
- To halve the proportion of the world's people without access to safe drinking water.
- To achieve universal completion of primary schooling.
- To achieve gender equality in access to education.
- To reduce maternal mortality ratios by three-quarters.
- To reduce under-five mortality rates by two-thirds.
- To halt and begin to reverse the spread of HIV/AIDS, malaria and other major diseases.

These goals build on the international development goals, which include three more targets namely, to reduce infant mortality rates by two-thirds, to provide access for all who want reproductive health services and to implement national strategies for sustainable development by 2005 to reverse the loss of environmental resources by 2015.

Source: Human Development Report, 1999.

The improvement in adult literacy has been 7.1 percent from 1992 to 2000. Therefore, it is safe to estimate that the rate of growth in adult literacy improves by 1.9 percent from 2000 to 2005 and then by 3.0 percent from 2005 to 2010 and then after by 4.0 percent from 2010 to 2015. This improvement in the growth rate of adult literacy would improve the level of adult literacy by 9 percent from 2000 to 2005, by 12 percent from 2005 to 2010 and by 16 percent from 2010 to 2015.

On an average, the gross enrollment ratio from 1995 to 2000 has been 27 percent. That means during the period, out of 100 students, only 27 students were getting the chance to education, while the remaining 63 students were deprived of education. The area of education is the field that may improve faster if it gets proper planning and concern. If we assume that for the next five years, the rate of gross enrolment ratio increases by one every year i.e., an additional child joins the school per year, and then by year 2005 it would

reach to 32 percent. Improvement in economic standard facilitates the improvement in education and enrolment. Therefore, it is safe to assume the gross enrolment ratio to improve and reach to 40 percent in 2010 and 50 percent by the end of year 2015.

From 1994 to 2000, the per capita GDP [PPP $] has grown by 2.7 percent. A proposed minor shock of 0.3 percent in GDP growth rate would raise the growth rate for the period 2000 to 2005 to 3 percent. Further, if this growth rate improves by 1.5 percent every five years, then the growth rate for the period 2005 to 2010 would be 4.5 percent; and for the period 2010 to 2015, it would be 6 percent.

The expected growth in the human development indicators is given in Table: 6.

Table: 6 Expected Growth in Human Development Indicators
In percentage

	Past Performance	Expected Growth		
		2000 - 5	2005 - 10	2010 - 15
Life Expectancy	4.4	5	6	7
Adult Literacy Rate	7.1	9	12	16
Gross Enrolment Ratio	27	32	40	50
Per Capita GDP [PPP $]	2.7	3	4.5	6

ii. Estimation of Future Human Development Index [HDI]

On the basis of the expected growth in the human development indicators as worked out in Table: 6, the future human development indicators have been estimated as given in Table: 7. On the basis of the estimated future human development indicators, the future human development dimension indices have been estimated as provided in Table: 8.

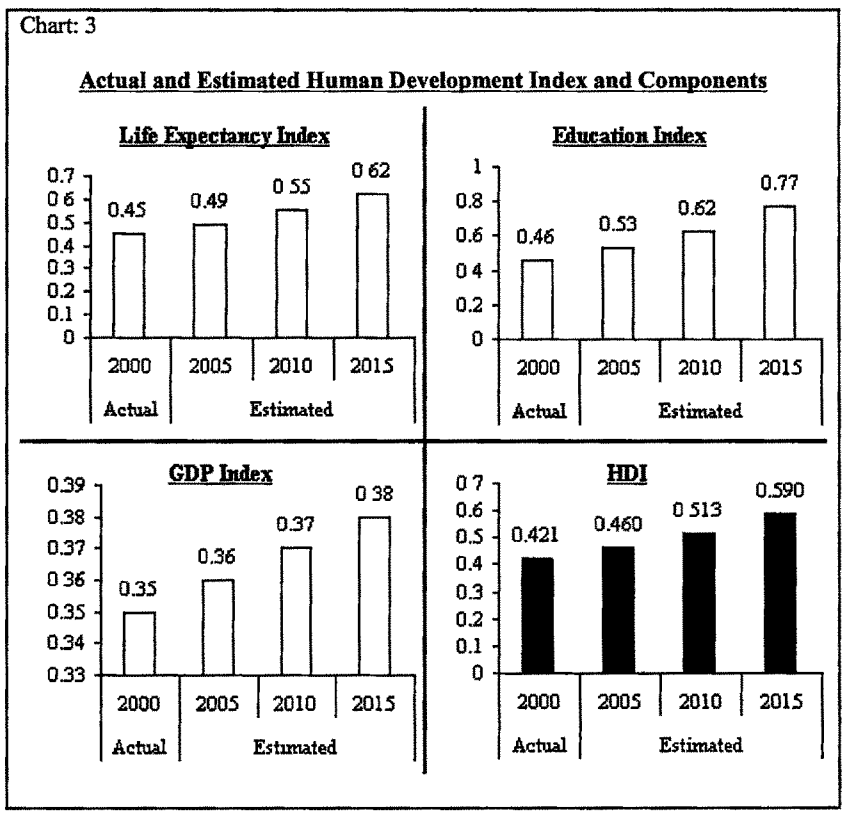
Finally, using the necessary human development dimension indices from Table: 8, the future human development index [HDI] has been estimated for the years 2005, 2010 and 2015, as given in Table: 9.

Table: 7 Estimated Human Development Indicators: Year 2005-2015				
	Actual	Estimated		
Year	2000	2005	2010	2015
Life Expectancy [Years]	52.0	54.6	57.9	62.0
Adult Literacy Rate [%]	55.7	60.7	68.0	78.9
Gross Enrolment Ratio [%]	26	35.6	49.7	74.3
Per Capita GDP [PPP $]	837.0	862.1	900.9	955.0

Table: 8 Estimated Human Development Dimension Indices: Year 2005-2015				
	Actual	Estimated		
	2000	2005	2010	2015
Life Expectancy Index	0.45	0.49	0.55	0.62
Education Index	0.46	0.53	0.62	0.77
Adult Literacy Index	0.56	0.61	0.68	0.79
Gross Enrolment Index	0.26	0.36	0.50	0.74
GDP Index	0.35	0.36	0.37	0.38

Table: 9 Estimation of Human Development Index: Year 2005-2015				
Years	2000	2005	2010	2015
HDI Values	0.421	0.460	0.513	0.590

Chart: 3



5.2 Social Expenditures and Human Development

The issues pertaining to human development have been receiving increasing attention from academicians as well as policy makers in recent times. This is largely due to the realization that economic growth does not automatically translate itself into better human development unless specific measures are taken in that direction [HDR, 1991]. In response to a greater recognition of human development, debate has witnessed repeated calls for restructuring of public expenditure in favor of social sector.

The World Bank, in its expenditure reviews, has more often argued that governments should restructure their spending patterns in favor of the social sectors and more specifically in favor of basic social services [BSS]. The BSS includes basic health, education, water and sanitation, nutrition and reproductive health and population programs. During the 1990, restructuring public expenditure towards BSS has increasingly been seen as a necessary first step for raising the levels of social indicators. The financing of basic social services, given their characteristics of being merit goods, must be guaranteed by the state [Bansal and Poddar, 1999].

The objective of the following study is to examine the trends in government expenditure on social sectors in post-independence Eritrea. This study focuses only on the Government expenditure on social sector. The revenue and expenditure of the government have been discussed in depth in Chapter: 6 under fiscal policy.

This examination has been conducted in three sections. Section: 1 examines the changing trend and composition of social expenditure in Eritrea. Section: 2 deals with estimation of the human expenditure ratios of the government of Eritrea for the period 1992 - 2000. At the end, Section: 3 studies the role of the Eritrean government on social sector.

a Trends and Composition of Social Expenditure

The total expenditure of the Eritrean government consists of developmental and non-development expenditures. The developmental expenditure may further be classified into economic, social and general services expenditures.

a.1 Trend

Table: 10 shows the social expenditure in millions of Nak'fa and as a percentage of total expenditure as well as development expenditure over a period of 1992 to 2000. From Table: 10, the following observations may be made:

i. Social expenditure has seen a significant increase from 12.1 million Nak'fa in 1992 to 504.7 million Nak'fa in 2000.

ii. As a percentage of total expenditure, social expenditure increased from 1.6 percent in 1992 to its highest level of 13.1 percent in 1997. From there it started declining to reach 8.6 percent in 1999, before rising again to 11.6 percent in the year 2000. On an average [1992 – 2000], the share of social expenditure in the total expenditure has remained very little at 7.0 percent.

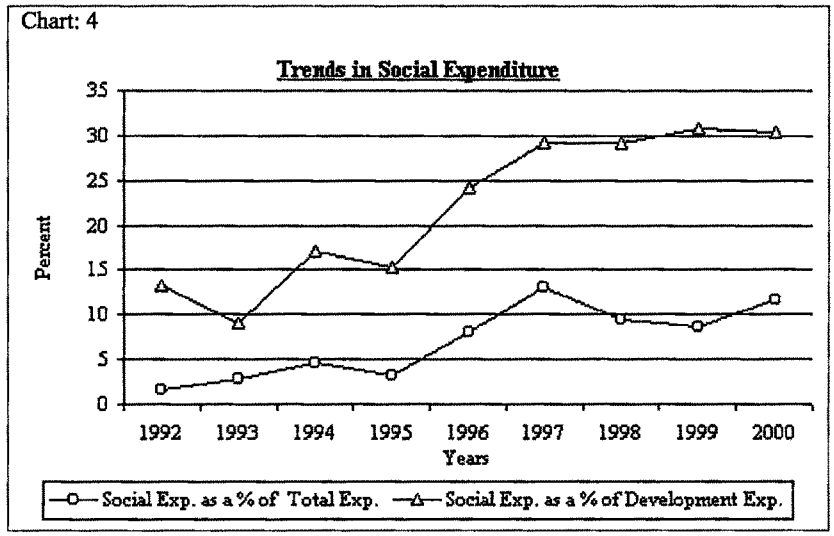
iii. As a percentage of development expenditure, the share of social expenditure increased from 13.2 percent in 1992 to 29.2 percent in 1997. Then after it remained stable at around 30 percent between 1997 and 2000.

The Trend in social expenditure as a percentage of total expenditure and development expenditure is shown in Chart: 4.

Table: 10 Trends in Social Expenditure

Years	In Millions of Nak'fa	As a % of Total Expenditure	As a % of Development Expenditure
1992	12.1	1.6	13.2
1993	41.1	2.9	9.0
1994	73.4	4.7	17.0
1995	83.9	3.3	15.3
1996	202.9	8.0	24.2
1997	334.0	13.1	29.2
1998	361.7	9.4	29.2
1999	433.2	8.6	30.7
2000	504.7	11.6	30.4
Average		**7.0**	**22.0**

Source: Computed from - World Bank, "Eritrea Optional and strategies for growth, " Vol. 2, Nov.94; IMF, "Eritrea: Selected Issues" September 1998; Govt. of Eritrea, "Unpublished Documents", 2001.



a.2 Composition

The social expenditure consists of expenditure on education, health, social affairs and others. Table: 11 shows the expenditure on various components of social expenditure over a period of time. A close look to this table reveals the following:

i. The expenditure on education has increased from 19.3 million Nak'fa in 1993 to 143.1 million Nak'fa in 2000.

ii. Expenditure on health has also increased from 18.1 million Nak'fa in 1993 to 118.2 million Nak'fa in 2000.

iii. The expenditure on social affairs has fluctuated highly, rising from 3.6 millions Nak'fa in 1993 to 32.9 million Nak'fa in 1995, falling again to 19.6 million Nak'fa in 1997 to rise again to its highest level of 36.2 million Nak'fa in 1999.

iv. The expenditure on human priority [HPE] which consists of expenditure on education and expenditure on health has seen a significant rise from 0.2 million Nak'fa in 1992 to 261.3 million Nak'fa in 2000.

Table: 11 Components of Social Expenditure in Millions of Nak'fa						
Years	Education [1]	Health [2]	Social Affairs [3]	Others [4]	Total [5]	HPE [1 + 2]
1992	0	0.2	0	11.9	12.1	0.2
1993	19.3	18.1	3.6	0.1	41.1	37.4
1994	9.3	13.5	29.5	21.1	73.4	22.8
1995	15.5	35.5	32.9	0	83.9	51
1996	49.3	87.7	25	40.9	202.9	137
1997	99.3	55	19.6	160.1	334	154.3
1998	91.4	85.5	35	149.8	361.7	176.9
1999	113.8	100.6	36.2	182.7	433.2	214.3
2000	143.1	118.2	33.1	210.2	504.7	261.3

Table: 12 shows the expenditure share of various components of social expenditure as a percentage to social expenditure. From this table, the following observations could be made:

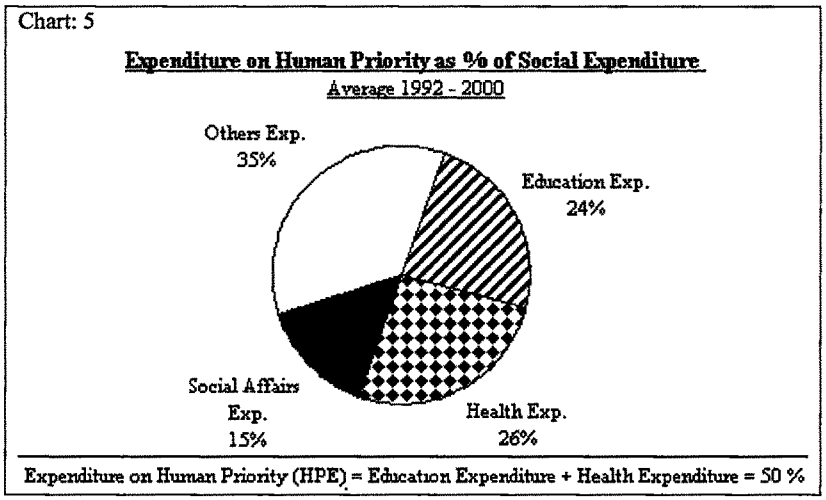
i. The share of education in social expenditure has declined in the initial years from 47 percent in 1993 to 24.3 percent in 1996. Then after, it has fluctuated from as high as 29.7 percent in 1997 to as low as 25.3 percent in 1998. On an average [1992 – 2000] the share of education in social expenditure has been 24 percent.

ii. The share of health in social expenditure increased from 1.7 percent in 1992 to 43.2 percent in 1996 before declining to 16.5 percent in 1997. From 1998 to 2000 it remained stagnant at about 23 percent of social expenditure. On an average the share of health has been 26 percent of social expenditure.

iii. The share of HPE in social expenditure has declined from 91 percent in 1993 to 67.5 percent in 1996. While, it remained stagnant at about 50 percent from 1998 to 2000. On an average the share of HPE has been 50 percent of social expenditure for the period 1992 – 2000 [See Chart: 5].

Table: 12 Components of Social Expenditure as % of Social Expenditure					
Years	Education [1]	Health [2]	Social Affairs [3]	Others [4]	HPE [1 + 2]
1992	0	1.7	0	98.3	1.7
1993	47	44	8.8	0.2	91
1994	12.7	18.4	40.2	28.7	31.1
1995	18.5	42.3	39.2	0	60.8
1996	24.3	43.2	12.3	20.2	67.5
1997	29.7	16.5	5.9	47.9	46.2
1998	25.3	23.6	9.7	41.4	48.9
1999	26.3	23.2	8.4	42.2	49.5
2000	28.4	23.4	6.6	41.7	51.8

Chart: 5

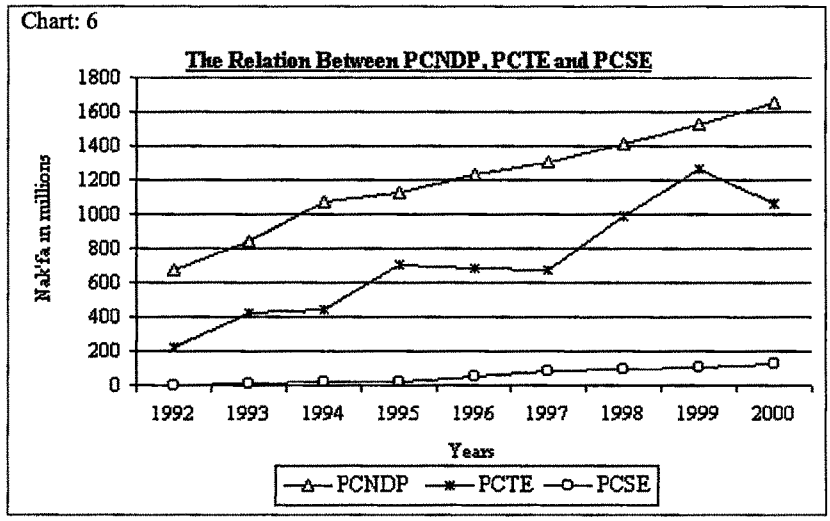


a.3 Per Capita Social Expenditure and GDP

Table: 13 shows year wise trend of per capita national domestic product [PCNDP], per capita total expenditure [PCTE] and per capita social expenditure [PCSE] for the years 1992 - 2000. As it can be seen from this table, the PCNDP has increased from 675.1 millions of Nak'fa in 1992 to 1,650.9 millions of Nak'fa in 2000, the PCTE has increased from 222.0 millions of Nak'fa in 1992 to 1,060.4 millions of Nak'fa in 2000 and the PCSE has shown a significant rise from 3.7 millions of Nak'fa in1992 to 123.1 millions of Nak'fa in 2000. The relation in the growth of PCNDP, PCTE and PCSE is shown in Chart: 6.

Table: 13	**Per Capita National Domestic Product and Expenditure** In millions of Nak'fa		
Years	PCNDP	PCTE	PCSE
1992	675.1	222	3.7
1993	845.5	417.5	12.1
1994	1071.9	444.9	21.1
1995	1129.2	709.4	23.5
1996	1236.6	688.8	55.3
1997	1309.6	678.1	88.6
1998	1412.4	994.4	93.2
1999	1525.8	1266.6	108.6
2000	1650.9	1060.4	123.1

Chart: 6



b. Estimation of Human Expenditure Ratio

b.1 Concept

The UNDP'S Human Development Report [HDR] of 1991 introduced four expenditure ratios which were considered necessary to analyze how public spending on human development can be designed and monitored. The four ratios are:

i. Public Expenditure Ratio [PER] = PE / NI
ii. Social Allocation Ratio [SAR] = SE / PE
iii. Social Priority Ratio [SPR] = HPE / SE
iv. Human Expenditure Ratio [HER] = HPE / NI

HER is the product of other three ratios.

$$HER = PER \times SAR \times SPR$$

$$HER = \frac{PE}{NI} \times \frac{SE}{PE} \times \frac{HPE}{SE}$$

Hence,

$$HER = HPE / NI$$

Where:
PE = Public Expenditure
SE = Social Expenditure
HPE = Expenditure on Human Priorities
NI = National Income [GDP at market price].

The HDR provides norms for various ratios, the fulfillment of which is expected to lead to higher levels of human development. According to the report, HER may need to be around 5 percent if a country wishes to do well in human development. This may be achieved by keeping the "PER moderate [around 25 percent], allocate much of this to the social sector [more than 40 percent] and focus on the social priority areas giving more than 50 percent" [HDR, 1991].

b.2 Estimation

The present section of study attempts to calculate the human expenditure ratio for Eritrea for the time period 1992 - 2000.

Based upon the UNDP prescribed norms, the national income [NI] has been calculated by the product method and hence is provided as GDP at market prices [NDP]. The social expenditure [SE] consists of expenditure on education, health, social affairs and others.

While for Expenditure on Human Priorities [HPE], expenditure on education and health have been taken. The figures for the components of expenditure ratio are given in Table: 14 below.

Table 14 **Components of Expenditure Ratio**
In millions of Nak'fa

Years	National Domestic Product [NDP]	Total Expenditure [PE]	Social Expenditure [SE]	Expenditure on Human Priorities [HPE]
1992	2000.8	734.8	12.1	0.2
1993	2527.9	1415.3	41.1	37.4
1994	3388.4	1548.4	73.4	22.8
1995	3655.3	2532.4	83.9	51
1996	4087.8	2527.8	202.9	137
1997	4468.9	2556.3	334	154.3
1998	4953.7	3858.2	361.7	184.9
1999	5496.8	5053.8	433.2	219.7
2000	6104.6	4347.8	504.7	254.5

Table: 15 has been prepared using the expenditure figures given in Table: 14. It shows the trends in Eritrea's expenditure ratios for the period 1992-200 in comparison to the ratios prescribed by the United Nations Development Program [UNDP].

The following observations may be made from Table: 15:

i. The public expenditure ratio [PER] has increased in Eritrea from 36.7 in 1992 to 71.2 in 2000. It is well above the UNDP target of 25 percent.

ii. The social allocation ratio [SAR], though witnessed a fluctuating increase from 1.6 in 1992 to 11.6 in 2000, is still far below the UNDP prescribed norm of 40 percent.

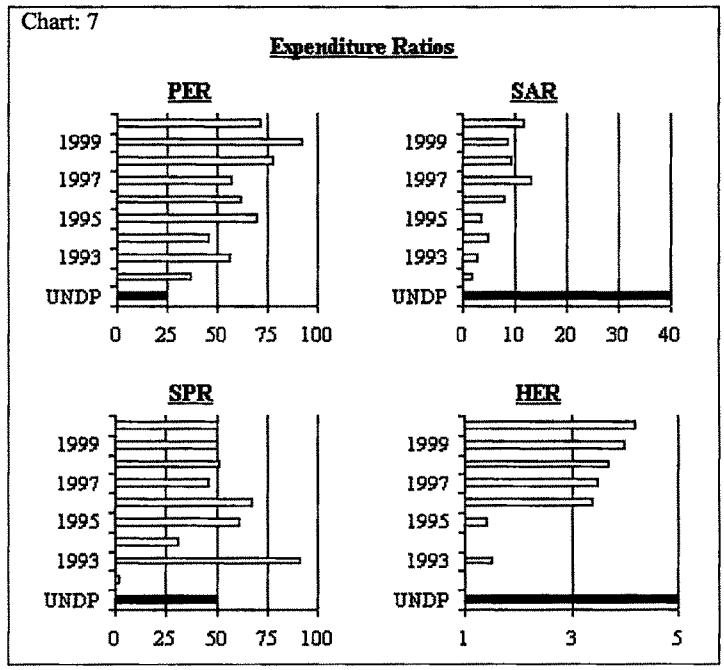
iii. The social priority ratio [SPR], which explains the share of human priority expenditure in the total public expenditure far exceeded the UNDP requirements in the years 1993, 1995 and 1996 and then stabilizing around 50 percent in the last three year, and hence just meeting the UNDP requirement.

iv. The human expenditure ratio [HER], though showing increasing trend, has remained far short of the UNDP targeted requirement of 5.0 throughout the period of analysis.

Table 15 Trends in Eritrea's Expenditure Ratios				
Years	PER	SAR	SPR	HER
1992	36.7	1.6	1.7	0
1993	56	2.9	91	1.5
1994	45.7	4.7	31.1	0.7
1995	69.3	3.3	60.8	1.4
1996	61.8	8	67.5	3.4
1997	57.2	13.1	46.2	3.5
1998	77.9	9.4	51.1	3.7
1999	91.9	8.6	50.7	4
2000	71.2	11.6	50.4	4.2
UNDP	**25**	**40**	**50**	**5**

The above comparison explains that there is further requirement of increasing state activity with higher social sector allocation. Moreover, the huge fluctuations in the ratios suggest the need for a proper planning in allocation of public funds. The graphical representation of the four expenditure ratios is presented in Chart: 7 below.

Chart: 7



5.3 Interrelationship Between Economic Growth and Human Development

There is growing agreement in the economic development literature that human development [HD] is the basic objective of economic activity with economic growth [EG] as the necessary instrument. However, the precise form of how an economy should attain this objective remains imprecise.

A large barrier to more precise development policy along these lines requires a more complete description of the inter-linkages between HD and EG. While the usual view that EG must precede HD has come up in endogenous growth theoretic models, its empirical importance has never been completely documented. Furthermore, the necessity of strong HD as a precursor to sustained growth implies that the uni-directional view of EG as causal to HD is mis-specified. [Boozer, Ranis and Stewart, 2002]

Traditionally, economic literature holds that economic development plays an important role in improving the health of a country's population. However, economists and researchers have begun to analyze this relation inversely: *how important are the long-term effects of good nutritional and health levels on the formation and accumulation of human capital, on the productivity and competitiveness of the work force, and on the long-term economic growth of a country?*

As a matter of fact, it has been argued that better human development could lead to more healthy and qualified labour force and hence to higher productivity [Anand and Sen, 2000]. But, in practice, it is realized that the achievement of human development is a long process, which requires huge investments in the social sector, which cannot be undertaken unless the economic capacity permits. Thus, this implies the necessity of economic growth in order to achieve human development.

Another important fact to note is that it is common experience that good economic performance has not always led to a good human development index HDI [Chelliah and Shanmugam, 2002]. This is clearly seen in many cases when countries with high per capita income fail to achieve high values of HDI.

So far in the preceding chapters we have analyzed the growth in the Eritrean economy and its human development. At this juncture, considering the positive relation between economic growth and human development from the theoretical point of view, the issue pertaining to growth and development in Eritrea invites certain important questions to be addressed. These questions are:

- Can we aim for economic growth and expect human development to occur automatically?
- Is there any link between economic growth and human development in Eritrea?
- Is it economic growth that leads to human development or the other way round?
- Are there conflicts between economic growth and human development?

This section of the present study attempts to address these important questions by aiming to explore the links and relationship between human development [HD] and economic growth [EG] in Eritrea.

a. Objectives

The objective of this study is to find out the inter-relationship between the economic growth [EG] and human development [HD] in Eritrea.

The main objectives of this study can be stated as follows:

1. To examine the degree of correlation among alternative economic and human development indicators

2. To identify the causal relationship between economic growth and human development

b. Specification of Variables

The variables indicative of economic and human development used in the analysis are:

i. Economic Indicators
   1. GDP
   2. Per Capita GDP [PCGDP]
   3. Non-agriculture GDP as a percentage of total GDP [NAGDP]

Perhaps, one would consider to use the degree of urbanization as an alternative to the [NAGDP] indicator. However, the urbanization variable would not capture the non-agriculture activity in rural areas.

ii. Human Development Indicators
   1. HDI
   2. Health, as measured by
      Life Expectancy at Birth [L]
      Life Expectancy Index [LX]
   3. Education, as determined by
      Adult Literacy Rate [LIT]
      Combined Gross Enrolment Ratio [ENRL]
      Education Index [EDX]

The time-series data for the period of years 1992 to 2000 has been used for the analysis.

c. Estimations

c.1 Correlation among alternative economic and human development indicators

To examine the degree of correlation among alternative economic and human development indicators, the coefficients of correlation between all the variables have been estimated as given below:

Table: 16 Correlation Matrix

	GDP	PCGDP	NAGDP	L	LIT	ENRL	LX	EDX	HDI
GDP	1								
PCGDP	0.996	1							
NAGDP	0.905	0.915	1						
L	0.964	0.937	0.831	1					
LIT	0.994	0.985	0.911	0.970	1				
ENRL	0.357	0.392	0.415	0.210	0.378	1			
LX	0.960	0.942	0.894	0.979	0.968	0.206	1		
EDX	0.924	0.919	0.866	0.876	0.942	0.641	0.864	1	
HDI	0.958	0.951	0.871	0.926	0.975	0.541	0.919	0.979	1

PCGDP Per Capita GDP
NAGDP Non-agriculture GDP
L Life Expectancy at Birth
LX Life Expectancy Index
LIT Adult Literacy Rate
ENRL Combined Gross Enrolment Ratio
EDX Education Index

The following observations are made from the above correlation matrix:

i. All the three economic development indicators- GDP, PCGDP and NAGDP- are highly correlated with each other.

ii. All the three economic development indicators are significantly related with HDI.

iii. The positive and high correlation of Non-Agriculture Income in GDP [NAGDP] with Per Capita GDP [PSGDP] and Human Development Index [HDI] signifies the fact that a higher proportion of NAGDP leads to higher PCGDP and HDI.

iv. A high correlation of economic development indicators [GDP, PCGDP and NAGDP] with the indicators of health [L and LX] and education [ED, ENRL and EX] signify the fact that a higher economic development does have a positive impact on the literacy and health level of Eritrean population.

c.2 Causal relationship between economic growth and human development

The causal relationship refers to the direction of relationship between economic growth and human development. Or put it the other way, is it the economic growth that causes human development or is it the human development that causes economic growth? Moreover, there is another important issue involved here. It is related to the time lag

involved in the transmission of this relationship, i.e. how long does it take to realize the influence of one variable on the other one?

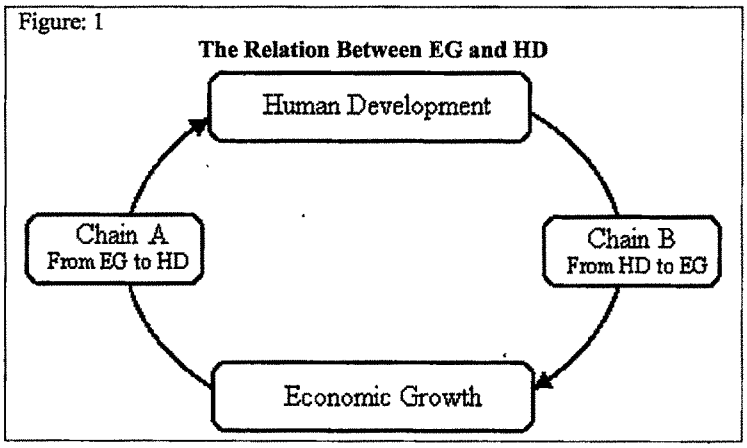
To answer the above, let us first discuss the two possible relationships in two *chains*.

Chain A: from EG to HD [how growth translates into HD]

Chain B: from HD to EG [how HD translates into growth]

Figure: 1

The Relation Between EG and HD



c.3 How growth translates into HD?

To find out whether *growth translates into HD*, Chain A may be specified as:

HDIt = f [PCGDPt]

However, to account for the time lag involved in this transmission, we have the following function:

HDIt = f [PCGDPt-i]

Here,

i. t refers to time and i refer to time lag.

ii. Incase HDI and PCGDP are related in the same year [without any time lag], then i = 0 and t-1 = t.

iii. However, if HDI at time t is influenced more by the earlier years [i = 1, 2,...n], then accordingly we specify the equation.

We have put i = 1, 2, ..n, and then compared the statistical results of all the estimated regression equations. The best selected equation is used to find out the transmission lag. The regression results are given below:

1. HDIt = f [PCGDPt]

Log HDIt = -0.774 + 0.019 log PCGDPt
[13.47] [6.59]

R Square	Adjusted R Square	Standard Error	F
0.861	0.841	0.006	43.534

2. HDIt = f [PCGDPt-1]

Log HDIt = -0.790 + 0.132 log PCGDPt-1
[31.21] [15.70]

R Square	Adjusted R Square	Standard Error	F
0.976	0.972	0.002	246.517

3. HDIt = f [PCGDPt-2]

Log HDIt = -0.721 + 0.111 log PCGDPt-2
[21.78] [10.03]

R Square	Adjusted R Square	Standard Error	F
0.952	0.943	0.00316	100.7392

From the above Chain-A regression equations, it is evident to note that the equation 2 has given the best results in terms of R-square, Adjusted R-square and t-values. Accordingly, it can be concluded that the HDI at time t gets affected most by PCGDP at time t-1, indicating that it takes one year for per capita GDP to have its maximum positive impact on HDI. The transmission lag from PCGDP to HDI is one year.

Another important finding is related to the growth elasticity of human development. As the above equations are in double-log, the value of co-efficient of independent variable [PCGDP] is the elasticity of HDI with respect to PCGDP. This elasticity for the selected

equation [Equation 2] is 0.132, indicating that a one percentage increase in PCGDP improves the HDI by 0.132 percentage after a gap of one year.

c.4 How HD translates into growth?

We have followed the same procedure for the causal relation from HD to PCGDP as followed in the earlier case. The estimated results are given below:

1. PCGDPt = f [HDIt]

Log PCGDPt = 5.73 + 6.870 log HDIt
[13.92] [6.59]

R Square	Adjusted R Square	Standard Error	F
0.861	0.841	0.050	0.0003

2. PCGDPt = f [HDIt-1]

Log PCGDPt = 5.152 + 5.279 log HDIt-1
[13.33] [5.44]

R Square	Adjusted R Square	Standard Error	F
0.831	0.803	0.042	29.628

3. PCGDPt = f [HDIt-2]

Log PCGDPt = 4.792 + 4.278 log HDIt-2
[22.76] [8.15]

R Square	Adjusted R Square	Standard Error	F
0.930	0.916	0.019	66.527

4. PCGDPt = f [HDIt-3]

Log PCGDPt = 4.785 + 4.187 log HDIt-3
[15.10] [5.34]

R Square	Adjusted R Square	Standard Error	F
0.877	0.846	0.023	28.601

From the regression results on Chain B, it is observed that regression equation 3 has given statistically the best results. This equation relates PCGDP at time t [PCGDPt] to HDI at time t-2 [HDIt-2]. Hence, it can be concluded from this result that PCGDP does get influenced by a change in HDI after a time lag of two years. Improved HDI gets transmitted into higher economic development after a lag of two years. The transmission lag from HDI to PCGDP is two years.

The value of co-efficient of independent variable [HDI] is the elasticity of PCGDP with respect to HDI in the above equations. This elasticity for the selected equation [Equation 3] is 4.278, indicating that a one percentage increase in HDI improves the PCGDP by 4.278 percentage after a gap of two years.

5.4 Conclusions

The following conclusions have been derived from this exercise:

a. Human Development

i. There has been a meager improvement in Eritrea's HDI value from 0.383 in 1992 to 0.421 in 2000. In terms of human development, Eritrea ranks among the lowest countries of the world. In fact, in terms of HDI rank, Eritrea occupied the 157th position out of 173 countries in the year 2000.

ii. Health, education and income levels influence the human development level. The assessment of the pattern of human development in Eritrea from 1992 to 2000 shows a very poor performance in terms of human development index [HDI]. This poor performance reflects the poor status of life expectancy, adult literacy rate, gross enrolment ratio and per capita GDP in Eritrea.

iii. Though the life expectancy at birth in Eritrea has improved from 49.8 years in 1992 to 52 years in 2000, the value of the life expectancy index has been very low at 0.45 in the year 2000.

iv. Adult literacy rate improved significantly from 48.3 percent in 1992 to 55.7 percent in 2000. However, the performance of gross enrolment ratio has been extremely poor. It increased from 25 percent in 1992 to 29 percent in 1995 and ended up declining to 26 percent in the year 2000. Perhaps this resulted in the poor value of education index throughout 1992 to 2000.

v. The per capita GDP reflects the standard of living in Eritrea. Though the per capita GDP has increased from US $ PPP 726 in 1992 to US $ PPP 837 in 2000, in terms of standard of living, Eritrea is among the poorest nations. In terms of GDP index

value, Eritrea remained almost stagnant in the range 0.32 to 0.35 throughout the period of study from 1992 to 2000.

vi. Eritrea's HDI value of 0.421 lies slightly below the HDI value in least developed countries, which is 0.445. It is far below the HDI values in Sub-Saharan countries, developing countries and medium human development countries, which have HDI values of 0.471, 0.654 and 0.691 respectively.

vii. The improvement of human development is a long process, which cannot be achieved overnight. The UNDP, in its millennium agenda for human development, indicated certain targets to be achieved by all developing countries by the year 2015. On the basis of Eritrea's past performance in human development and considering its potentiality and limitations, the important questions raised are: *What level of human development Eritrea would be able to achieve by the year 2015? Will Eritrea be able to match the UNDP millennium targets for life expectancy, adult literacy rate and gross enrolment ratio? Will Eritrea be able to catch up with the standard of developing countries in terms of human development index?*

To estimate the expected growth in the HDI indicators, we applied a realistic minor shock to each indicator on the basis of its past performance. After pegging up the values of human development indicators by giving these shocks, the HDI was estimated for the years 2005, 2010 and 2015 respectively. The results suggest that Eritrea would achieve the HDI of 0.460 in 2005, 0.513 in 2010 and 0.59 in 2015.

viii. Considering Eritrea's economic problems and opportunities, particularly related to human development, within a span of ten years Eritrea was able to improve its HDI from 0.383 in 1992 to 0.421 in 2000, in spite of difficult conditions of political instabilities, war and huge setbacks in economic and social developments.

Moreover, if one sees the viability of the Eritrean economy in terms of unutilized and promising vast natural resources in relation to the small population of the country, there is potential optimism in the improvement of human development in near future.

ix. But, it is important to mention that with this trend, Eritrea will not be able to achieve much by the year 2015, unless the human development process is properly planned. The achievement of human development cannot be attained merely by setting future human development targets. In fact, it depends upon the support and participation of both, the public and the government. Hence, it is necessary to create the enabling environment, and also to establish the required political, social, economical and institutional goals.

b. Social Expenditure and Human Development

i. The issues pertaining to human development have been receiving increasing attention from academicians as well as policy makers in recent times. This is largely due to the realization that economic growth does not automatically translate itself into better human development unless specific measures are taken in that direction. In response to a greater recognition of human development, debate has

witnessed repeated calls for restructuring of public expenditure in favor of social sector.

The World Bank, in its expenditure reviews, has more often argued that governments should restructure their spending patterns in favor of the social sectors and more specifically in favor of basic social services [BSS]. The BSS includes basic health, education, water and sanitation, nutrition and reproductive health and population programs. During the 1990s, restructuring public expenditure towards BSS has increasingly been seen as a necessary first step for raising the levels of social indicators. The financing of basic social services, given their characteristics of being merit goods, must be guaranteed by the state.

ii. In Eritrea, in the post-independence period, social expenditure as a percentage of total expenditure has shown fluctuating trend. On an average, the share of social expenditure in total expenditure has remained very little at 7 percent. However, social expenditure has been getting an increasing share of the development expenditure, averaging at 22 percent for the entire post independence period.

iii. The social expenditure consists mainly of education, health, social affairs and others. Of which, education and health together make Expenditure on Human Priority [HPE]. In the recent years, the expenditure on human priorities - education as well as health, has been quite dismal, showing no signs of noticeable improvements. For Eritrea to improve its status on human development, it should put the education and health on the priority of its development agenda.

iv. The UNDP'S Human Development Report [HDR] of 1991 introduced four expenditure ratios which were considered necessary to analyze how public spending on human development can be designed and monitored. The HDR provides norms for various expenditure ratios, the fulfillment of which is expected to lead to higher levels of human development.

v. The public expenditure ratio [PER], defined as ratio of public expenditure to national income, increased in Eritrea from 36.7 in 1992 to 71.2 in 2000. It is well above the UNDP target of 25 percent.

vi. The social allocation ratio [SAR], defined as ratio of social expenditure to public expenditure, though witnessed a fluctuating increase from 1.6 in 1992 to 11.6 in 2000, is still far below the UNDP prescribed norm of 40 percent.

vii. The social priority ratio [SPR], which explains the share of human priority expenditure in the total public expenditure far exceeded the UNDP requirements in the years 1993, 1995 and 1996 before stabilizing at around 50 percent in the last three years, and hence just meeting the UNDP requirement.

viii. The human expenditure ratio [HER], indicating the ratio of expenditure on human priority to national income, though showing increasing trend, has remained far short of the UNDP targeted requirement of 5.0 throughout the period of analysis.

ix. To improve the poor state of human development, Eritrea should direct more and more funds towards the human priority sectors.

c. ***Interrelationship between Economic Growth and Human Development***

i. The issue pertaining to growth and development in Eritrea invites certain important questions to be addressed. These questions are: *Can we aim for economic growth and expect human development to occur automatically? Is there any link between economic growth and human development in Eritrea? Is it economic growth that leads to human development or the other way round? Are there conflicts between economic growth and human development?* This section of the present study attempts to address these important questions by aiming to explore the links and relationship between human development [HD] and economic growth [EG] in Eritrea.

The indicators used to measure the economic growth are Gross Domestic Product [GDP], Per Capita Gross Domestic Product [PCGDP] and Non-Agriculture Gross Domestic Product [NAGDP]. The human development indicators are Human Development Index [HDI], Health and Education.

ii. The positive and high correlation of Non-Agriculture Income in GDP [NAGDP] with Per Capita GDP [PSGDP] and Human Development Index [HDI] signifies the fact that a higher proportion of NAGDP leads to higher PCGDP and HDI.

iii. A high correlation of economic development indicators [GDP, PCGDP and NAGDP] with the indicators of health and education signify the fact that a higher economic development does have a positive impact on the literacy and health level of Eritrean population.

iv. The HDI at time t gets affected most by PCGDP at time t-1, indicating that it takes one year for per capita GDP to have its maximum positive impact on HDI. The transmission lag from PCGDP to HDI is one year.

v. Another important finding is related to the growth elasticity of human development. The elasticity for the selected equation is 0.132, indicating that a one percentage increase in PCGDP improves the HDI by 0.132 percentage after a gap of one year.

vi. PCGDP at time t gets affected by HDI at time t-2. Hence, it can be concluded from this result that PCGDP does get influenced by a change in HDI after a time lag of two years. Improved HDI gets transmitted into higher economic development after a lag of two years. The transmission lag from HDI to PCGDP is two years.

vii. The value of the elasticity of PCGDP with respect to HDI in the selected equation is 4.278, indicating that a one percentage increase in HDI improves the PCGDP by 4.278 percentage after a gap of two years.

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