

Economic Growth and Sector Identification

Economic growth is an increase in the ability of the economy to produce commodities and services. Broadly speaking, economic growth occurs as the economy increases its human and material resources and learns how to employ them more productively. While some forms of production are wasteful and even harmful, a moderate rate of economic growth may be an efficient way for an economy to provide more of the commodities and services that people want.

Economic growth can be achieved either by simply expanding the factors of production [land, labour, capital, and entrepreneurship] or by improving the quality of a factor or factors of production. Economic growth caused by expansion of factors of production is known as *extensive* growth, and that which results from improving the quality of a factor of production is known as *intensive* growth. Extensive growth consists of simply adding more of the same factors of production. A real economic welfare and a rising standard of living come mainly from intensive growth, i.e. increasing productivity, employing efficient manpower and improved capital goods and technology.

Productivity of manpower is a direct reflection of the quality of labour force, which depends greatly on education and training. Skilled, well-educated and healthy people are more efficient and productive than the unskilled, ignorant and malnourished and ill. Improvement in the quality of human capital increases productivity of labour and hence contributes to intensive growth of an economy.

Economists use Gross Domestic Products [GDP] as a measure of total production. However, for several reasons, economic growth cannot be equated strictly with the rate of growth of GDP. First of all, because, not all of the increases in GDP in a typical year are real - i.e. due to increases in the actual quantity of goods produced. In fact quite often a great deal may be due to increases in the prices of those goods. Thus in order to obtain a measure of real economic growth, the inflationary factor needs to be excluded from the growth of GDP.

Second, a country has a certain capacity at a given time and it may or may not produce up to that capacity. The total amount of goods and services, which a country may possibly produce at full employment of resources, is its *potential* GDP. While the actual level of output during a given period is its *actual* GDP. The actual GDP is highly affected by fluctuations in aggregate demand and the utilization of productive capacity. For example, the volume of production that the economy produces during a period of high unemployment will be far short of that, which may be produced at full employment levels. However, most of the increase in actual GDP would be due to an increased utilization of productive capacity rather than to growth in capacity itself. This is what economists describe as an *unsustainable* expansion of GDP. Thus, a better measure of growth would be the per capita growth of the real level of potential GDP.

Third, it is often more useful to describe the growth of GDP in relation to the growth of population. Because, for example, if the GDP is growing at 5 percent in two countries, say country A and country B, but the population is growing at 2 percent in country A and at 4 percent in country B; then obviously the average person in country A has 3 percent more GDP at the end of the year, while the average person in country B has only 1 percent more GDP. Therefore, the per capita GDP in country A has risen by 3 percent, while it has increased only by 1 percent in country B. Therefore, due to this reason, the per capita growth of the real level of potential GDP is the better measure for economic growth. However, despite this fact, it is common indeed to find economic growth expressed as simply the rate of growth of real GDP.

Hence, to meet with these criteria, this chapter analyzes the growth in the Eritrean economy after accounting the nominal GDP figures for the inflationary and population factors. The growth in the Eritrean economy and its distribution is being analyzed in terms of the *Actual Real GDP*, *Actual Nominal GDP* and *Real Per Capita Income* – base year 1992. The GDP figures for Eritrea belong to two different eras of different economic systems and different political conditions; they are the pre – independence era [1984 – 1991] and the post – independence era [1992 – 2000]. Moreover, it is important to clarify that Eritrea achieved its independence in May 1991. However, the actual functioning of the government in terms of policy framing and implementation began in 1993 and the national development objectives were declared in 1994 [see Box: 1]. Therefore, because the independence year [1991] was much of a legacy of the previous

system; it has been considered a part of the pre – independence era. While the years 1992 and 1993 are considered as the post – independence initial years, when the policies and plans were not yet formulated. Therefore, these two years have been ignored whenever the data does not show consistency. Thus, the analysis of the economic growth focuses on the period 1994 – 2000.

It is also equally important to mention that the data used in the present chapter has been compiled from different local and international sources. Of which the most important sources have been the documents provided by various Ministries of the Government of Eritrea and the publications of the World Bank, International Monetary Fund, United Nations and the Government of Ethiopia.

The analytical work of this chapter covers the following topics:

- 3.1. Economic Growth in Eritrea: Pre and Post Independence Analysis
- 3.2. Composition of GDP and Sectoral Growth
- 3.3. The Agricultural Sector
- 3.4. The Industrial Sector
- 3.5. The Services Sector
- 3.6. The Infrastructure Sector

Box: 1

Eritrea's National Development Objectives

With the independence of Eritrea, its economy ended a long history [of more than a century] of colonial policies to start a new era with national policy. After independence the Government of Eritrea designed the economic policy of the country and indicated the following national development objectives to be achieved:

- Improved agricultural production by introducing irrigation, increasing productivity of farmers, pastoralists and agro-pastoralists.
- Developed capital and knowledge - intensive and export oriented industrial and service sector.
- An upgrade and technologically improved informal sector.
- A competitive international financial sector.
- A developed and systematic public health care system, and a broadly based educational skills and languages and extensive human capital formation.
- An effective social welfare and safety net system, and an upgraded and protected environment that is free from pollution.
- A developed democratic political system, with free and sovereign State where human rights are respected and an internally peaceful and stable nation in harmony with its neighbors.

Source: Govt. of Eritrea, "Macro Policy", 1994.

3.1 Economic Growth in Eritrea: Pre and Post Independence Analysis

In order to understand the position of the Eritrean economy, a study of trends in nominal and real GDP is very necessary. But, before analyzing the state of the Eritrean economy in the post – independence era; it is very essential to provide a clear picture of the economy in the pre – independence period.

a. Pre-Independence Scenario: Colonial Exploitation

Between November 1869 and May 1991, the Eritrean economy passed through a long history of colonial exploitation by three colonial powers: Italy, British and Ethiopia. The major form through which the Italian exploitation of Eritrea [1869-1941] was done was trade. Trade policies were designed to drain away agricultural, mineral and natural wealth from Eritrea to feed the Italian industries with raw materials.

“The Mortician doctrine originated in a policy known initially as the Colonial Pact and later as the economy de trite. Under either name, the economic situation was to benefit Italy - raw materials were to be exported from the colony to Italy and the colony was to import Italian merchandise in a closed economic circuit designed to exclude foreign traders.” [Mesghenna, 1988]

“Under the Italian colonial rule, investments focused mainly on developing basic infrastructure and agriculture with the objective of supporting the needs of Italian settlers and exporting primary commodities to Italy e.g. Coffee, cotton, sisal, tropical fruits and vegetables” [World Bank, 1994]

Ten years of British colonization [1941-52] were quite enough for the so-called, “British Administration” or “British Care” to plunder Eritrea’s economy by dismantling its infrastructure installations and selling it to the Anglo-Egyptian Sudan, Pakistan and British Companies [Pankhurst, 1952].

Under the Ethiopian colonization [1960-91], the Eritrean economy entered into a new phase of long-years of exploitation. The Ethiopian exploitation of Eritrea’s resources was done through two phases of different colonial ideologies and economic systems. In the first phase [1960-74], the imperial regime of emperor *Haile Selase* exploited

Eritrea's manpower, resource and strategic location. During this era, the imperial regime transferred most of the vital industrial establishments and public institutions of Eritrea to Ethiopia and also adopted various policies to drain Eritrea's resources [Seb'be, 1983]. Besides, the Ethiopian churches, which possessed wide agricultural areas in Eritrea, were badly involved in the exploitation of the Eritrean tenants.

In the second phase, when the *Derg* military regime took power in Ethiopia [1974-91], the exploitation of Eritrea continued in a worse manner, specially when the *Derg* regime adopted a command economy system, and as a consequence, nationalized most of Eritrea's private sector assets including land, housing, industries and financial institutions. Added to the adverse impact of long colonial exploitation and plundering, the thirty years of liberation war had destroyed most of Eritrea's infrastructure bases to bring the Eritrean economy into ashes.

After this brief introduction of the eco-political conditions, the state of the economy in the pre-independence era has been expressed as follows:

a1. Growth and Trends in Pre - Independence GDP

Table: 1 provides the nominal and real GDP figures with the annual growth rates. While, the Charts: 1 and 2 provide a graphical representation of figures in the table. The pre-independence period consists of last eight years [1984 – 1991] before the independence throughout the study.

The study of these figures reveals the following observations:

- i. Throughout the pre – independence period [1984 – 1991], real GDP was been less than nominal GDP, also, the gap between real and nominal GDP continued widening. This reflects the increase in prices, which affected the economy during this period.
- ii. Total nominal GDP at factor cost grew by 44.6 percent, rising in money terms from 779.1 million Nak'fa in 1984 to 1,126.2 million Nak'fa in 1991. While the real GDP, during the same period, increased from 615.7 million Nak'fa to 1,126.2 million Nak'fa, reaching its highest level of 693.1 million Nak'fa in 1987. The trend growth rate of nominal and real GDP in pre-independence period was 1.7 and 0.2 percent respectively.
- iii. The annual growth rate in nominal GDP fluctuated from as high level as 22.4 percent in 1986 to as low as –0.2 percent in 1990, thus recording an average growth rate of 5.9 percent per annum. While the average annual growth rate in

real GDP had only been 0.6 percent. It had also witnessed high fluctuations, ranging from as low level as -7.2 percent in 1990 to high levels as 6.7 percent in 1991. On an average the real growth rate was more volatile at 9.7 than the nominal growth rate at 1.9.

Table: 1 GDP Growth: Pre - Independence Era At factor cost				
Years	Nominal		Real	
	In Millions of Nak'fa	Annual Growth Rate	In Millions of Nak'fa	Annual Growth Rate
1984	779.1	--	615.7	--
1985	816.7	4.8	643.2	4.5
1986	999.8	22.4	670.5	4.2
1987	945.8	-5.4	693.1	3.4
1988	1016.1	7.4	659.1	-4.9
1989	956.6	-5.9	640.6	-2.8
1990	955.3	-0.2	594.4	-7.2
1991	1126.2	17.9	634.1	6.7
Average	--	5.9	--	0.6
Standard Deviation	--	11.0	--	5.4
<i>Volatility</i> ¹	--	<i>1.9</i>	--	<i>9.7</i>
<i>Growth Rates</i> ²	<i>1.7</i>	--	<i>0.2</i>	--

1. Volatility is defined as a ratio of average annual growth rate [A] to its standard deviation [SD] throughout.

2. Growth rates have been estimated using usual loglinear trend equations, as shown below.

Trend Equations: 1984 to 1991

$$\begin{aligned} \text{Log [NGDP]} &= 2.898 + 0.017 t & R^2 &= 0.662 & F &= 11.76 \\ &[15.27] \quad [3.429] \end{aligned}$$

$$\begin{aligned} \text{Log [RGDP]} &= 2.817 - 0.002 t & R^2 &= 0.051 & F &= 0.326 \\ &[164.19] \quad [-0.57] \end{aligned}$$

Notes:
 NGDP = Nominal Gross Domestic Products
 RGDP = Real Gross Domestic Products
 T = Time Variable

Chart: 1

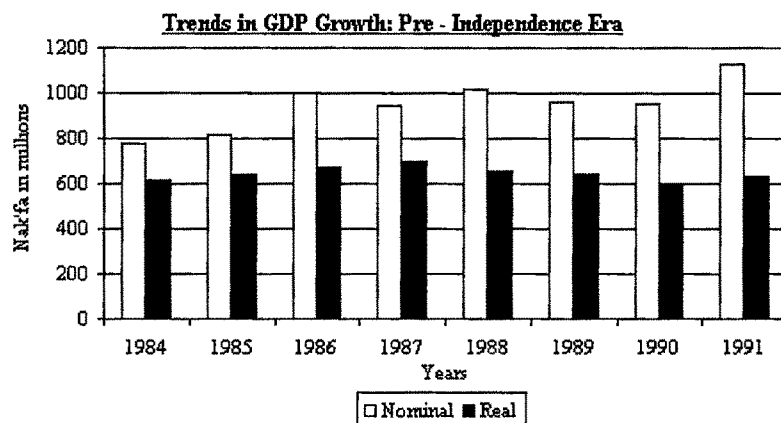
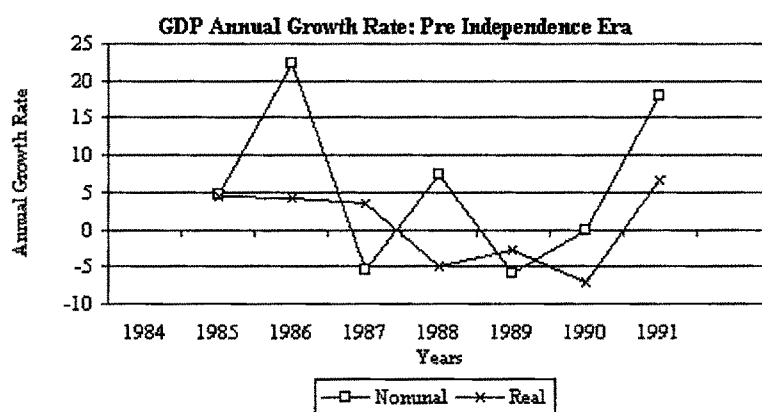


Chart: 2



a2. Growth and Trend in Pre – Independence Per Capita Income

Eritrea's per capita income in the pre independence era is the image, reflecting the real status of the colonial economic policies. As regards the per capita income, the following points may be observed from the data in Table: 2 and Chart 3 and 4:

- i. The level of real per capita income in 1984 was 235 Nak'fa. It rose to its highest level of 241.5 Nak'fa in 1987. Since then, it recorded a continuous fall till it reached 189.3 Nak'fa in 1990. In 1991 [the year of independence] the per capita income showed a reverse tendency rising to 196.9 Nak'fa.

- ii. The annual rate of growth in the per capita income has shown continuous fall from 1.4 percent in 1985 to its lowest level of -9.9 in 1990, before rising to 4.0 percent in 1991. Thus, over the whole period of eight years [1984 -1991], the per capita income recorded a fall of -16.2 percent. On an average the rate of annual growth had been -2.4 percent.

Table: 2 Per Capita Income Growth: Pre - Independence Era				
At factor cost				
Years	Nominal		Real	
	Nak'fa	Annual Growth Rate	Nak'fa	Annual Growth Rate
1984	297.4	--	235.0	--
1985	302.5	1.7	238.2	1.4
1986	359.6	18.9	241.2	1.2
1987	329.5	-8.4	241.5	0.1
1988	343.3	4.2	222.7	-7.8
1989	313.6	-8.6	210.0	-5.7
1990	304.2	-3.0	189.3	-9.9
1991	349.8	15.0	196.9	4.0
Average	--	2.8	--	-2.4
Standard Deviation	--	10.8	--	5.3
<i>Volatility</i>	--	3.8	--	-2.2
<i>Growth Rates</i>	0.4	--	1.4	--

Trend Equations: 1984 to 1991

$$\text{Log [NPCGDP]} = 2.492 + 0.004 t \quad R^2 = 0.100 \quad F = 0.668$$

[98.27] [0.81]

$$\text{Log [RPCGDP]} = 2.411 - 0.014 t \quad R^2 = 0.762 \quad F = 19.31$$

[140.74] [-4.39]

Notes:

NPCGDP = Nominal Per Capita Gross Domestic Products

RPCGDP = Real Per Capita Gross Domestic Products

Chart: 3

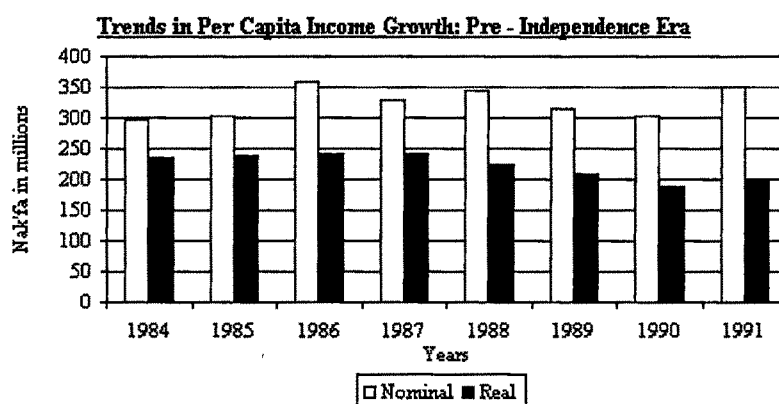
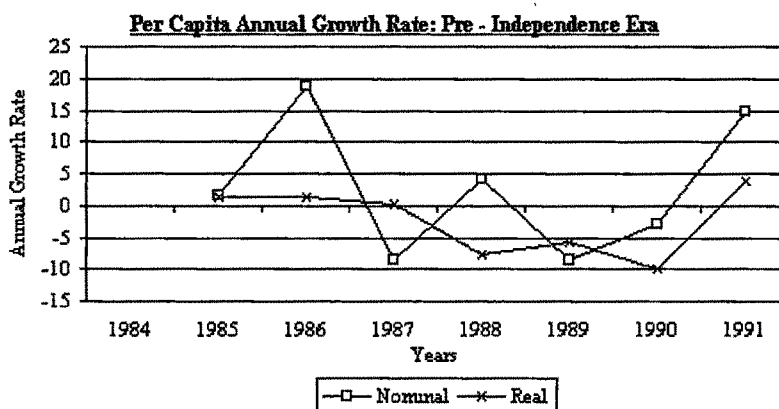


Chart: 4



b. *Trends in Eritrea's Economic Growth: Post- Independence Analysis*

b1. Growth and Trends in GDP

Table: 3 shows Eritrea's GDP figures in nominal and real money values, as well as the annual rate of growth in both. These data reveal that:

- i. In the post independence era, nominal GDP has grown from 2,000.8 million Nak'fa in 1992 to 6,104.6 million Nak'fa in 2000. After accounting for inflation, real GDP [1992 = 100] came down to 2501.9 in 2000. This wide gap between the nominal and real GDP implies that the rate of inflation was very high during this period.
- ii. The annual growth rate in GDP has been highly fluctuating in terms of nominal as well as real values. The annual growth rate in real GDP fell down sharply

from 9.7 percent in 1994 to -3.1 percent in 1995. Since then it fluctuated between 8.7 percent in 1996 to 2.6 percent in 1999, then recording a second sharp fall in 2000, reaching the lowest level ever of -6.2 percent. Here, it is important to mention that during the year 2000, the second war offence of Ethiopia to Eritrea had reached to its peak.

- iii. The growth rate in real GDP has been very poor with high fluctuations. On an average the annual growth rate in real GDP has been 3.0 percent. Much of the fluctuations in the economic growth have been due to the effect of the political instability and direct confrontation with Ethiopia and other neighboring countries, which the Eritrean economy depends upon.
- iv. Trend growth rate in real GDP has been quite low in post-independence Eritrea at 1.8 percent. Moreover, the real GDP growth rate has shown more volatility than the nominal GDP.

Table: 3 GDP Growth: Post - Independence Era At factor cost				
Years	Nominal		Real	
	In Millions of Nak'fa	Annual Growth Rate	In Millions of Nak'fa	Annual Growth Rate
1992	2000.8	--	2000.8	--
1993	2527.9	26.3	1958.1	-2.1
1994	3388.4	34.0	2148.6	9.7
1995	3655.3	7.9	2082.8	-3.1
1996	4087.8	11.8	2263.5	8.7
1997	4468.9	9.3	2409.1	6.4
1998	4953.7	10.8	2600.4	7.9
1999	5496.8	11.0	2667.1	2.6
2000	6104.6	11.1	2501.9	-6.2
Average	--	15.3	--	3.0
Standard Deviation	--	9.5	--	6.1
<i>Volatility</i>	--	<i>0.6</i>	--	<i>2.0</i>
<i>Growth Rates</i>	<i>4.9</i>	--	<i>1.8</i>	--

Trend Equations: 1993 to 2000

$$\text{Log [NGDP]} = 3.399 + 0.049 t \quad R^2 = 0.965 \quad F = 167.83$$

[175.84] [12.95]

$$\text{Log [RGDP]} = 3.282 + 0.018 t \quad R^2 = 0.855 \quad F = 35.481$$

[212.50] [5.95]

Chart: 5

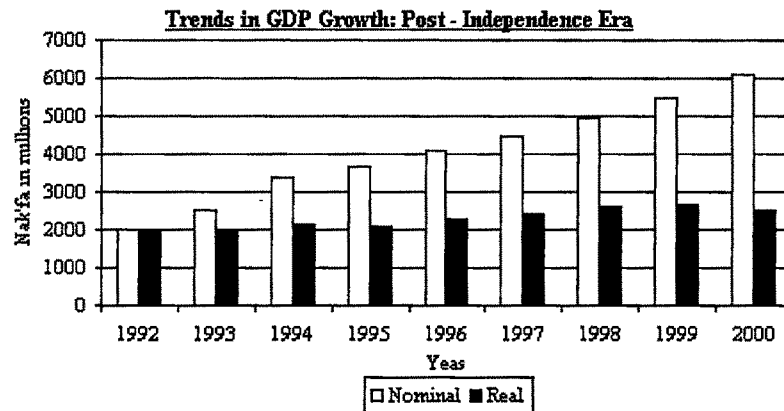
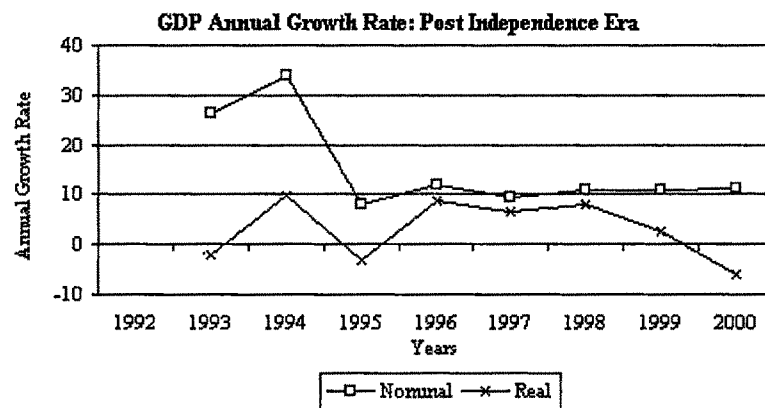


Chart: 6



b2. Growth and Trend in Per Capita Income

In order to get clearer picture of the growth of the GDP, it is essential to analyze now the trend in per capita income in Eritrea during the same period. From the per capita data provided in Table: 4, the following points may be observed:

- i. From these figures, we see that the nominal per capita income has grown from 604.5 Nak'fa in 1992 to 1,488.9 Nak'fa in 2000, while the real per capita income has only grown from 604.5 Nak'fa to 610.2 Nak'fa during the same period.
- ii. The real per capita income has witnessed very high fluctuations during this period. It grew from 577.6 Nak'fa in 1993 to 617.4 Nak'fa in 1994. After falling to 583.4 Nak'fa in 1995, it again started to rise till it reached its highest level in

the whole period to 670.2 Nak'fa in 1998. In the last two years it started falling again from 668.5 Nak'fa in 1999 to 610.2 Nakfa in 2000.

- iii. The annual growth rate in per capita income too has been highly fluctuating in terms of nominal as well as real values. The annual growth in real GDP has fallen from as high rate as 6.9 percent in 1994 to -8.7 percent in 2000, passing in between through a number of fluctuations ranging from a low level of -5.5 percent in 1995 to a high level of 4.9 percent in 1998.
- iv. The real per capita GDP growth rate in Eritrea has been quite dismal in the post-independence era at just 0.6 percent. Infact, the pre-independence period showed comparatively better growth rate.

Table: 4 Per Capita Income Growth: Post - Independence Era				
At factor cost				
Years	Nominal		Real	
	Nak'fa	Annual Growth Rate	Nak'fa	Annual Growth Rate
1992	604.5	--	604.5	--
1993	745.7	23.4	577.6	-4.4
1994	973.7	30.6	617.4	6.9
1995	1023.9	5.2	583.4	-5.5
1996	1113.8	8.8	616.8	5.7
1997	1185.4	6.4	639.0	3.6
1998	1276.7	7.7	670.2	4.9
1999	1377.6	7.9	668.5	-0.3
2000	1488.9	8.1	610.2	-8.7
Average	--	12.2	--	0.3
Standard Deviation	--	9.4	--	5.9
Volatility	--	0.8	--	21.4
Growth Rates	3.7	--	0.6	--

Trend Equations: 1993 to 2000

$$\text{Log NPCGDP} = 2.881 + 0.037 t \quad R^2 = 0.940 \quad F = 94.805$$

[147.21] [9.73]

$$\text{Log RPCGDP} = 2.765 + 0.006 t \quad R^2 = 0.419 \quad F = 4.338$$

[178.86] [2.08]

Chart: 7

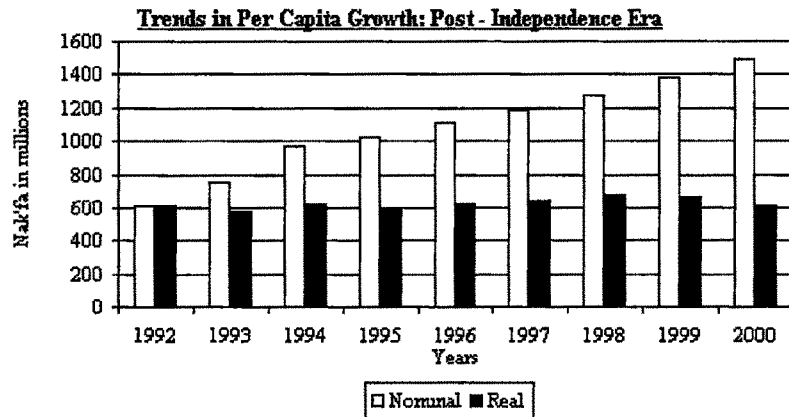
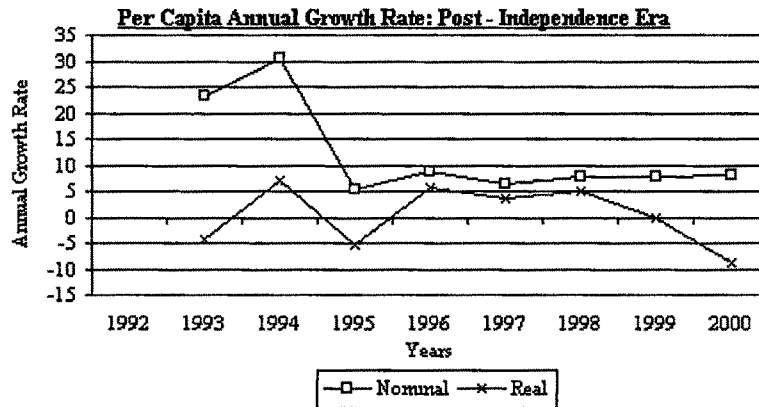


Chart: 8



c. The Eritrean Economy: Regional Comparison

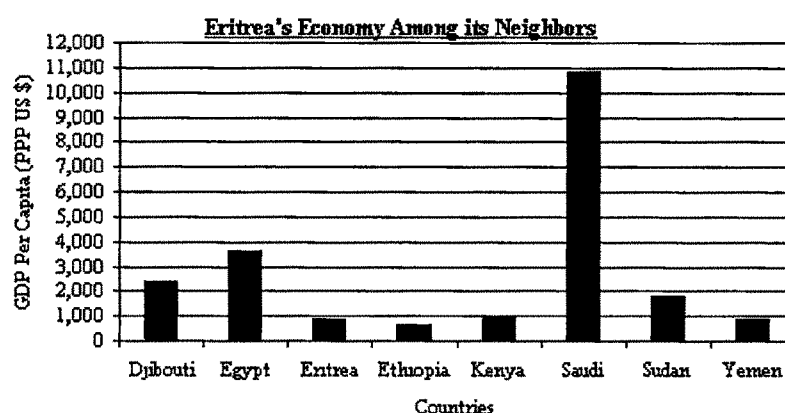
In spite of Eritrea's richness in natural resources, long years of colonization brought the Eritrean economy into ashes. The decoder of war, the recurrence of droughts and famines further compounded the adverse impact of colonial exploitation. All these hazards formed the present poverty-ridden economy of Eritrea.

Today, Eritrea is considered among the poorest countries in the world. Its economy performance is the lowest among the economies of the countries in the region. Though Eritrea has the smallest population size [4.1 million], a comparison among eight countries in the neighborhood ranks it the seventh in terms of GDP per capita [PPP US

\$], and the last in terms of GDP per capita growth. The position of Eritrea's economy in the region is shown in Table: 5 and Chart: 9.

Table: 5 Eritrea's Economy Among its Neighbors - 2000			
At factor cost			
Country	GDP Per Capita [PPP US \$]	GDP Per Capita Growth [Annual %]	Population [In millions]
Djibouti	2,377.00	- 1.28	0.5
Egypt	3,635.00	3.14	60.30
Eritrea	837.00	-8.7	4.10
Ethiopia	668.00	2.95	61.30
Kenya	1,022.00	- 2.48	29.30
Saudi Arabia	10,815.00	0.40	15.4
Sudan	1,797.00	6.45	28.30
Yemen	896.00	2.36	16.30

Chart: 9



3.2 Economic Composition and Sectoral Growth

The overall economy of Eritrea is derived from four major sectors, namely: the agricultural sector, industrial sector, services sector and infrastructure. Under this topic, we shall analyze the changing composition and growth in these four sectors. While the internal growth of each sector is studied under the respective topics.

Table: 6 shows the contribution of each sector to the total GDP. Figures for the sectoral growth in the Eritrean economy and for the annual growth rates are given in Table: 7 and Table: 8 respectively. A close study of the data in these Tables reveals the following points:

- i. The share of agriculture sector in the total GDP was highly affected by the seasonal rains and thus showed a continuous fall and high fluctuations. It declined from 29.9 percent in 1992 to 12.8 percent by the year 2000. On an average it has contributed 18.5 percent to the total GDP.

In general, except for the years 1994 and 1995 the performance of the agricultural sector has been very poor. In money terms, it has continued to decline from 598.1 million Nak'fa in 1992 to 320.6 million Nak'fa in the year 2000. Except for the years 1994, 1997 and 1998, in general the annual growth rate in this sector remained negative.

- ii. The share of the industrial sector in total GDP has continued to rise. It has increased from 14.3 percent in 1992 to 21.4 percent in the year 2000. On an average it contributed 18.2 percent of the total GDP. For a country such as Eritrea, in its initial stages of development, this share is quite fine or rather promising.

The industrial sector has witnessed a gradual growth from 285.2 million Nak'fa in 1992 to 534.7 million Nak'fa in the year 2000. The annual growth rate in industry significantly increased from -9.6 percent in 1994 to 24.6 percent in 1996, after which it continued to decline sharply till it reached to -5.1 percent by the year 2000.

- iii. The share of the services sector has shown rising signs. It has increased from 38.9 percent in 1992 to 42.4 percent in the year 2000. On an average, it contributed 41.5 percent of the total GDP, which is the highest among all the sectors. This reflects the administration priority in the post – independence era.

The service sector has significantly grown from 778.4 million Nak'fa in 1992 to 1,116.7 million Nak'fa in 1999. By the year 2000 it has fallen to 1,059.8 million Nak'fa. The annual growth rate in this sector has shown high fluctuations. It increased from -2.1 percent in 1995 to 9.1 percent in 1996 and then after declined to 0.9 percent in 1997, before rising sharply to 9.4 percent in 1998. From 1998 onwards it continued to fall till it finally reached -5.1 percent by the year 2000.

- iv. The infrastructure sector has increased from 16.9 percent in 1992 to 23.5 percent in the year 2000. On an average it secured 21.7 percent of total GDP. This is also due to the huge tasks of reconstruction and rehabilitation; undertaken by the government to rebuild the war devastated infrastructure sector.

In money terms, the infrastructure sector has significantly grown from 339.1 million Nak'fa in 1992 to 618.3 million Nak'fa in the year 1999, which is almost the double. The annual growth rate in infrastructure has fluctuated from as low as -5.1 percent in 2000 to as high as 13 percent in 1997. The average growth rate in this sector for the period 1993 to 2000 has been 7.6 percent.

Table: 6 GDP Distribution by Sectors				
Real GDP at factor cost				
Years	Agriculture	Industry	Service	Infrastructure
1992	29.9	14.3	38.9	16.9
1993	20.2	16.7	40.2	22.8
1994	23.0	13.8	42.5	20.8
1995	19.5	16.5	42.9	21.1
1996	16.7	19.0	43.0	21.3
1997	16.0	20.6	40.8	22.6
1998	14.9	20.9	41.4	22.9
1999	13.8	21.1	41.9	23.2
2000	12.8	21.4	42.4	23.5
Average	18.5	18.2	41.5	21.7

Chart: 10

GDP Distribution by Sector: Post - Independence Era

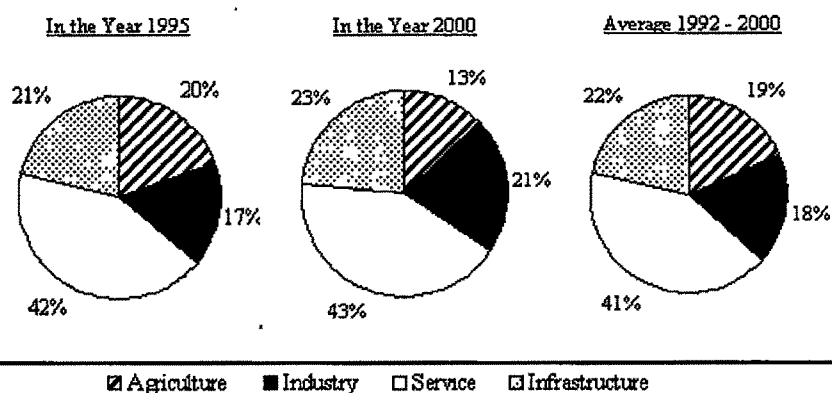


Table: 7 GDP Composition					
Real GDP at factor cost - In millions of Nak'fa					
Years	Agriculture	Industry	Service	Infrastructure	Total
1992	598.1	285.2	778.4	339.1	2000.8
1993	395.7	327.3	787.9	447.2	1958.1
1994	493.4	295.8	912.2	447.3	2148.6
1995	405.4	344.4	892.6	440.5	2082.8
1996	378.7	429.2	973.9	481.6	2263.5
1997	385.9	496.0	983.0	544.3	2409.1
1998	387.1	542.6	1075.3	595.4	2600.4
1999	368.5	563.5	1116.7	618.3	2667.1
2000	320.6	534.7	1059.8	586.8	2501.9

Chart: 11

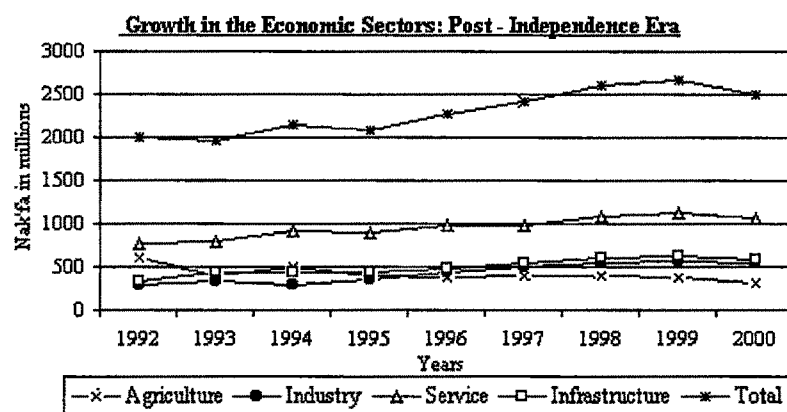
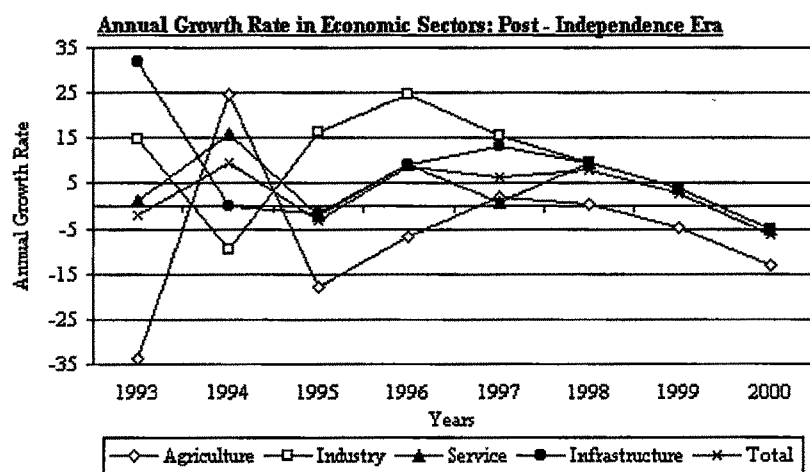


Table: 8 Annual Growth Rate in Economic Sectors					
Real GDP at factor cost – In percentage					
Years	Agriculture	Industry	Service	Infrastructure	Total
1992	---	--	---	--	---
1993	-33.8	14.8	1.2	31.9	-2.1
1994	24.7	-9.6	15.8	0.0	9.7
1995	-17.8	16.4	-2.1	-1.5	-3.1
1996	-6.6	24.6	9.1	9.3	8.7
1997	1.9	15.6	0.9	13.0	6.4
1998	0.3	9.4	9.4	9.4	7.9
1999	-4.8	3.9	3.9	3.8	2.6
2000	-13.0	-5.1	-5.1	-5.1	-6.2
Average	-6.1	8.7	4.1	7.6	3.0

Chart: 12



3.3 Agricultural Sector

In developing countries agricultural development is normally regarded as a prerequisite for economic development. The vital role of agriculture arises out of the position the agrarian sector occupies in the overall economy of these countries. Mainly, the agricultural sector is the largest economic sector in most developing economies. It plays a crucial role in the development of the economy by providing food and raw materials, employments to a very high proportion of working population, capital for its own development and surpluses for economic growth.

Historically, the African man was the first mankind to practice cultivation, even before the appearance of the civilizations of the great rivers into existence [those civilizations, which existed in the valleys of River Nile in Egypt, Tigris and Euphrates in Iraq, Sind and Gang in India and Sinkyang and Hwang Huo in China]. Eritreans practiced agriculture before thousands of years. The residents of Gash and Setit valleys, who emigrated from the valleys and forests of Sudan in ancient ages, were the oldest farmers in the world. In the high plateau of Eritrea, the *Kushites* practiced farming before five thousand five hundred years, till they were forced by *Sabaeans* and *Himyarites* who emigrated from Yemen before two thousand five hundred years ago and introduced the cultivation of mountains on escarpments. The Egyptians also introduced the cultivation of cotton in the Gra valley, fruits in Keren region and vegetables in Massawa region in the nineteenth century [Seb'be, 1983]

Modern cultivation was never adopted in the country except in a very limited scope, not only because of the climate and natural conditions which to some extent hindered the development and modernization of the agricultural sector, but also because of the Italian colonial policies and the general instability Eritrea witnessed during the British occupation and the Ethiopian colonization [Seb'be, 1983].

The present topic studies the agricultural sector of Eritrea covering the following related topics:

- a. Agriculture and the Eritrean Economy
- b. Composition and Growth of Agriculture Production
- c. Agriculture Profile

Indeed, it would have made this topic more complete to include the discussion of agricultural production and productivity, agricultural finance, and agricultural marketing, which are all important issues related to agriculture. However, the unavailability of data on those issues limits the scope of this topic to the above-mentioned points.

a. Agriculture and the Eritrean Economy

Agriculture had always been the backbone of the Eritrea economy. It secured the livelihood for over 70 percent of the population. Agricultural products including livestock and fisheries were an important source of raw materials for the industrial sector, which mainly consists of a number of agro-based industries oriented to external markets. Even today, agriculture assumes the same importance for the Eritrean economy. But, due to the effect of the thirty years of war, neglect and lack of rain, the agricultural sector has little to provide, and hence, the industrial sector depends on imported raw materials to cover about 80 percent of its demand for inputs. In the overall economy, agriculture including forestry and fishery contribute, on an average, about 12.8 percent of the total GDP in the year 2000.

b. Composition and Growth of Agriculture Production

b.1 Composition of Agriculture Production

The agricultural sector of Eritrea constitutes of four sub-sectors namely:

- i. Crops,
- ii. Livestock,
- iii. Forestry, and
- iv. Fishing.

Table: 9 and Chart: 13 show the composition of the agricultural sector of Eritrea. As it is evident from the table, the share of each agricultural sub-sector in total agriculture for the pre and post independence eras has been as follows:

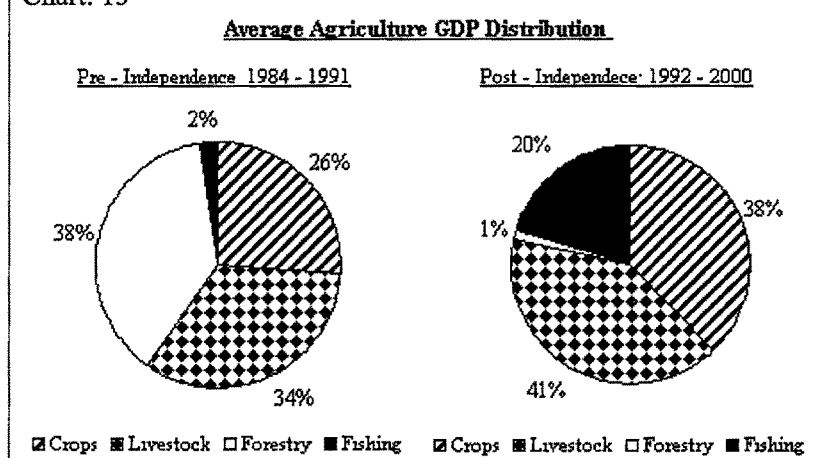
- i. The share of crops in total agriculture has shown a falling tendency during both the pre and post independence periods. In the pre independence period, it had sharply fallen from 40.3 percent in 1984 to 9.1 percent in 1991. While in the post independence period, it declined from 47.1 percent in 1992 to 34.8 percent in 1996 and then after remained stable at 36.3 percent from 1997 to 2000. On an average, the share of crop in total agriculture has increased from 26.0 percent in the pre independence period to 37.7 percent in the post independence period.
- ii. Livestock assumed an important position within the agricultural sector during both, the pre and post independence periods. The share of livestock in total agriculture achieved a significant increase in the pre independence period. It increased from 22.8 percent in 1984 to 45.8 percent in 1991. While in the post independence period, it slightly increased from 37.5 percent in 1992 to 41.4 percent in 1996, and then after remained constant at 40.8 percent from 1997 to 2000. On an average, the share of livestock in total agriculture has improved from 33.6 percent in the pre independence period to 40.7 percent in the post independence period.
- iii. The role of forestry in agriculture has drastically deteriorated after independence. After assuming the leading role by contributing the highest average share of 37.9 percent during 1984 to 1991, its average contribution in the post independence era has dramatically fallen to 1.4 percent. From 1984 to 1991, it increased from 34.9 percent to 42.3 percent. While after independence, it has continued to rise gradually from 0.4 percent in 1992 to 1.4 percent in the year 2000.

Apart from the significant role of forestry in agriculture during the pre independence period, it certainly reveals the colonial exploitation policy for the resources of Eritrea. It also reveals the under utilization of the forestry sector as a source of production after independence.

- iv. As contrary to the forestry sector, the role of the fishing sector in agriculture has significantly improved after independence. Before independence its average share in total agriculture remained as low as 2.5 percent. But, after independence, its average contribution has significantly increased to 20.3 percent, which is about 8 times higher. After independence, its contribution has increased from 15.1 percent in 1992 to 21.5 percent in the year 2000.

Table: 9 Composition of Agriculture Production As Percentage of Total Agriculture					
Era	Years	Crops	Livestock	Forestry	Fishing
Independence	1984	40.3	22.8	34.9	2.0
	1985	38.6	26.0	33.3	2.1
	1986	32.6	28.6	36.6	2.2
	1987	35.7	28.3	33.7	2.3
	1988	21.4	35.9	39.9	2.8
	1989	17.3	39.2	40.7	2.8
	1990	13.2	42.5	41.5	2.8
	1991	9.1	45.8	42.3	2.8
	Average	26.0	33.6	37.9	2.5
Post-Independence	1992	47.1	37.4	0.4	15.1
	1993	31.1	47.3	0.9	20.7
	1994	43.9	36.5	1.4	18.2
	1995	37.0	40.3	2.3	20.4
	1996	34.8	41.4	1.9	21.9
	1997	36.3	40.8	1.4	21.5
	1998	36.3	40.8	1.4	21.5
	1999	36.3	40.8	1.4	21.5
	2000	36.3	40.8	1.4	21.5
	Average	37.7	40.7	1.4	20.3

Chart: 13



b.2 Agricultural Production and Growth

Table: 10 and 11 show the agriculture production in sub-sectors [at current factor cost] in millions of Nak'fa and the annual growth rates respectively. Chart: 14 and 15 present the pre and post independence annual growth rates in agriculture sub-sectors respectively. From the study of the figures in the Tables and the Charts, the following observations may be made:

- i. The pre independence period witnessed serious crop failure. From 1984 to 1991, crop had significantly fallen from 89.3 million Nak'fa to 29.2 million Nakfa respectively. Apart from 1987, the single year to register a positive growth rate of 13.4 percent; the annual growth rate in crop recorded a negative growth throughout the pre independence period.

After independence, crop production has shown a significant improvement growing to 281.5 million Nak'fa in 1992. The post independence growth level in crop has been fluctuating from as low as 158.8 million Nak'fa to as high as 341.5 million Nak'fa. The annual growth rate has sharply increased from 43.6 percent in 1993 to 115.1 percent in 1994, a year with quite good monsoon. After 1994, the annual growth started to decline till it reached to -9.5 percent in 1996, before rising again to 9.0 percent by 1997. From 1998 to 2000, the annual growth rate has remained stagnant at 3.0 percent.

- ii. Livestock has continued to grow significantly during both the pre and post independence periods. In the pre independence period, it grew from 50.7 million Nak'fa to 147.0 million Nak'fa from 1984 to 1991. The annual growth rate from 1985 to 1991 increased from 17.4 to 35.0 percent, which is almost double.

In the post independence period, livestock has grown from 223.9 million Nak'fa in 1992 to 319.1 million Nak'fa in the year 2000. The annual growth rate declined from 8.0 percent in 1993 to -1.1 percent in 1996, then after remained stable at 3.0 percent from 1997 to the year 2000.

- iii. Forestry sector recorded a significant growth in the pre independence period. It increased from 77.4 million Nak'fa in 1984 to 135.7 million Nak'fa in 1991. The annual growth rate increased sharply from -1.6 percent in 1985 to 14.0 percent in 1986, before falling sharply to -4.4 percent in 1987. From 1988 to 1991, the annual rate of growth continued to rise from 3.7 percent to 27.7 percent respectively.

After independence agricultural production from forestry has declined drastically. In 1992, it earned as little as 2.6 million Nak'fa and increased to 16.1 million Nak'fa in 1995, before falling again to 12.5 million Nak'fa in 1996. From 1997 to 2000, it remained stable in the range of 10 to 10.9 million Nak'fa.

The annual growth rate in forestry during this period seriously declined from 140.9 percent in 1994 to -22.4 percent in 1996. Again, after rising to 20.0 percent in 1997, it continued to decline sharply till it reached 2.8 percent in the year 2000.

Table: 10 Agricultural Production						
In Millions of Nak'fa						
Era	Years	Crops	Livestock	Forestry	Fishing	Total
Pre-Independence	1984	89.3	50.7	77.4	4.5	221.8
	1985	88.5	59.5	76.2	4.9	229.0
	1986	77.5	68.1	86.9	5.3	237.7
	1987	87.9	69.8	83.1	5.7	246.4
	1988	46.2	77.6	86.2	6.1	216.1
	1989	40.5	92.0	95.5	6.7	234.6
	1990	33.8	108.9	106.3	7.2	256.2
	1991	29.2	147.0	135.7	9.0	320.9
Post-Independence	1992	281.5	223.9	2.6	90.1	598.1
	1993	158.8	241.7	4.4	105.9	510.8
	1994	341.5	284.4	10.6	141.6	778.1
	1995	263.2	286.5	16.1	145.6	711.4
	1996	238.2	283.5	12.5	149.8	684.0
	1997	259.6	292.0	10.0	154.3	715.9
	1998	267.4	300.8	10.3	158.9	737.4
	1999	275.4	309.8	10.6	163.7	759.5
	2000	283.7	319.1	10.9	168.6	782.3
Growth Rate		1.6	1.3	2.4	2.2	1.5

Trend Equations: 1993 to 2000

<i>Log [Crops]</i>	= 2.335 + 0.016 <i>t</i> [32.11] [1.12]	R ² = 0.172	F = 1.254
<i>Log [Livestock]</i>	= 2.401 + 0.013 <i>t</i> [170.83] [4.73]	R ² = 0.788	F = 22.395
<i>Log [Forestry]</i>	= 0.894 + 0.024 <i>t</i> [7.11] [0.99]	R ² = 0.141	F = 0.988
<i>Log [Fishery]</i>	= 2.068 + 0.022 <i>t</i> [75.34] [4.06]	R ² = 0.733	F = 16.501
<i>Log [Agriculture]</i>	= 2.777 + 0.015 <i>t</i> [71.52] [2.02]	R ² = 0.406	F = 4.111

- iv. The contribution of the fishing sector during the pre independence period has been very marginal and the lowest among the agriculture sub-sectors. From 1984 to 1991, the growth in this sector had doubled, increasing from 4.5 million Nak'fa to 9.0 million Nak'fa. Between the years 1985 and 1990, the annual growth rate remained in the range of 7.0 to 9.8 percent, before sharply jumping up to 25.0 percent in 1991.

After independence, the fishing sector witnessed a significant growth. The growth in this sector increased from 90.1 million Nak'fa in 1992 to 168.6 million Nak'fa in the year 2000. The annual growth rate in this sector sharply declined from 33.7 percent in 1994 to -2.9 percent in 1996, and remained stagnant at 3.0 percent from 1997 to the year 2000.

- v. Trend growth in agricultural production has been quite low in post-independence ranging from 1.3 percent to 2.4 percent across agriculture sub-sectors. The volatility in the annual average growth rates in agriculture sub-sectors has been low.

Table: 11 Agricultural Annual Growth Rates In Percentage						
Era	Years	Crops	Livestock	Forestry	Fishing	Total
Pre - Independence	1984	--	--	--	--	--
	1985	-0.9	17.4	-1.6	9.0	3.3
	1986	-12.4	14.5	14.0	8.2	3.8
	1987	13.4	2.5	-4.40	7.5	3.7
	1988	-47.4	11.2	3.7	7.0	-12.3
	1989	-12.3	18.6	10.8	9.8	8.6
	1990	-16.5	18.4	11.3	7.5	9.2
	1991	-13.6	35.0	27.7	25.0	25.3
	Average	-12.8	16.8	8.8	10.6	5.9
	Standard Deviation	18.4	9.8	10.8	6.4	11.1
	<i>Volatility</i>	<i>-1.4</i>	<i>0.6</i>	<i>1.2</i>	<i>0.6</i>	<i>1.9</i>
Post-Independence	1992	--	--	--	--	--
	1993	43.6	8.0	69.2	17.5	-14.6
	1994	115.1	17.7	140.9	33.7	52.3
	1995	-22.9	0.7	51.9	2.8	-8.6
	1996	-9.5	-1.1	-22.4	-2.9	8.6
	1997	9.0	3.0	20.0	3.0	4.7
	1998	3.0	3.0	3.0	3.0	3.0
	1999	3.0	3.0	2.9	3.0	3.0
	2000	3.0	3.0	2.8	3.0	3.0
	Average	18.0	4.7	33.5	7.9	6.4
	Standard Deviation	43.5	5.9	52.5	11.9	20.1
	<i>Volatility</i>	<i>2.4</i>	<i>1.3</i>	<i>1.6</i>	<i>1.5</i>	<i>3.1</i>

Chart: 14

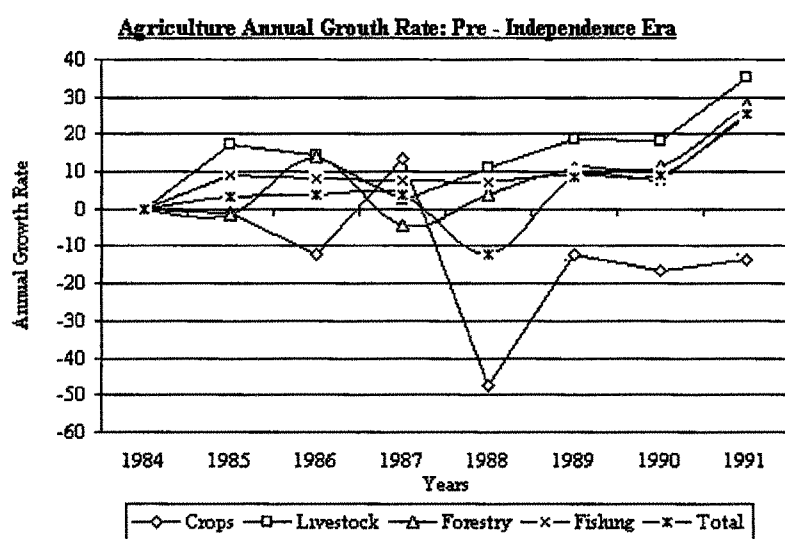
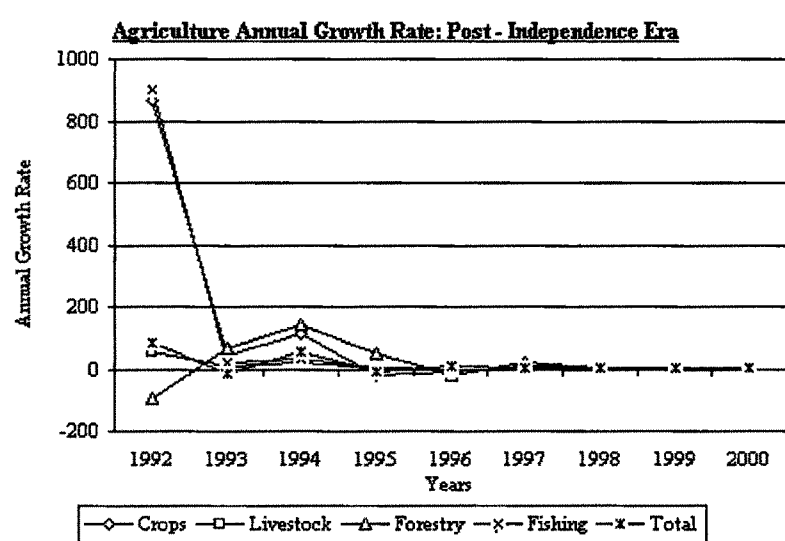


Chart: 15



c. *Agricultural Profile*

c1. Agricultural Crops

After his 1927 tour around the world, in search of the main center of origin of the main crops and grains, *Vafilouvef* [a Russian agricultural scientist] mentioned that Eritrea, in spite of its small area, is among the greatest variety of crops and plants possessing countries in the world. According to an old Italian estimate, Eritrea possesses 235 types of different crops and plants. While the Federal Government of Eritrea had increased this figure to 500 types in its 1957 estimates [Seb'be, 1983].

The various agricultural crops that Eritrea possesses can be divided into two groups: food crops and cash crops. Food Crops include both cereals and pulses, while cash crops include horticulture crops and non-food crops like *Oilseeds, Cotton*, etc.

i. Food Crops:

The main food crops in Eritrea are *barley, Durra* and *sorghum* followed by *taff, finger millet, wheat* and *maze*. All these cereals are rain-fed crops and a wide range of them is adapted to the short growing season between April to September. The yield of all these crops varies greatly from year to year depending upon the rainfall. The food crop production does not suffice the local demand.

ii. Cash Crops:

The principal cash crops in Eritrea are horticulture crops [such as fruits and vegetables], cotton and oilseeds [like *sesame, linseed, rape, groundnuts* and *nihug, i.e. Guioria - Abyssinica*]. In the 1950s, trial with *Sunflower* and *castor beans* had shown satisfactory results. Recently, *coffee* is also expected to have a significant importance as a cash crop.

c.2 Irrigation

Water is necessary and indispensable to agricultural production. In certain areas where rainfall is very scanty as well as uncertain, artificial irrigation is absolutely essential because without it cultivation is almost impossible. Moreover, in certain areas though rainfall may be abundant but still cultivation for the whole year may not be possible, due to the concentration of the rainfall in a short period of the year, leaving the rest of the year dry. In such conditions the provision of artificial irrigation is also very essential

because it will ensure growing more than one crop in a year. Irrigation is also essential for the production of huge value crops such as fruits, vegetables, cotton and oilseeds. In short, the availability of proper irrigation system ensures continuous supply of water for double or even triple cultivation, which is essential to defeat the recurrent drought and famine and also for rapid increase in agricultural production, which in return is essential for rapid industrialization.

c.2.1 Irrigation Potential

The horizontal expansion of cultivated land in Eritrea depends upon the availability of water. It has been noticed that wherever adequate water either through rainfall or irrigation was available, agriculture has flourished and widespread crop failure has occurred when there has been drought. Therefore, if proper irrigation system is ensured, huge plains of good virgin land could be brought under cultivation to produce high volume of agricultural crops throughout the year.

The Ministry of Agriculture has estimated the extent of the existing irrigation as 21, 599 hectares, which is about 6 percent of the total area under cultivation. Of the total area under cultivation, about 15,630 hectares are under spate irrigation [seasonal irrigation], 4109 hectares under perennial irrigation [minor irrigation] and 1860 hectares under regulated diversion. FAO estimates brought down the actual irrigated total area to 7000 - 8000 hectares, which is closer to 3 percent of the total cultivated area [FAO, 1994].

i. *Perennial Irrigation [Minor Irrigation]:*

Perennial irrigation is mostly practiced in the western lowlands from the shallow aquifer along the Barka and Gash rivers. Except the Ela-Beret estate near Keren, which is a unique case of perennial irrigation, most of the farms under the perennial irrigation system are small in size ranging from 10 hectares [or even less] to 200 hectares. The Elaberet estate is irrigated from seven reservoirs stored from the seasonal rivers, Anseba and Balrwa. The estate grows citrus, vegetable and forage crops for the attached dairy farms. In the past, part of the production was processed and exported.

ii. *Spate Irrigation [Seasonal Irrigation]:*

Spate irrigation is the most common form of seasonal irrigation. It is mostly practiced in the eastern lowlands and parts of the western lowlands. Being depending mostly on floods, this system contributes only moderately to the national drought residence. Though the initial costs of this system are low, frequent repairs are necessary to avoid flood damage. Under this system, only minimal control of water is possible and during flood damage some farmers suffer loss of harvest due to excess water while others suffer inadequate water.

The Ali-ghdir estate, which was developed by Italian entrepreneurs on the lower Gash near Teseney, is a particular case of seasonal irrigation system. It was developed to irrigate a single crop of cotton by diverting part of the seasonal flow of the Gash river, on an area of 8000 hectares of which only 5000 hectares were cultivated annually, because of the limited capacity of the system. In addition to the rain fed cultivation system and irrigated cultivation system, small-scale irrigation from hand-dug wells is also practiced in the valleys of the high lands.

Table: 12 Irrigation by Type and Product [1992]		
Region	Irrigated Hectares	Main Products
[a] Minor Irrigation: Small Dams, Dug Wells and Bore Wells		
Hamasien	543	Vegetables
Seraye	1,145	Vegetables
Akeleguzai	461	Vegetable about 80 ha of citrus
Senhit	660	Vegetable and citrus, ratio of 2:1
Barka	600	Fruit and vegetables
Gash - Setit	700	Fruit and vegetables
Total	4,109	
[b] Spate Irrigation		
Akeleguzai	500	Sorghum, millet, maize
Semhar	9,950	Sorghum, millet, maize
Sahel	3,040	Sorghum, millet, maize
Barka	140	Sorghum, millet, maize
Dankalia	2,000	Sorghum, millet, maize
Total	1,5630	
[c] Regulated Diversion		
Gash-Setit	1,860	Cotton - the Ali Ghider Estate.
Grand total	21,599	
Source. FAO "Agricultural Sector Review and Project Identification" [Aprnl, 1994]		

c.2.2 Dams:

In the valleys of the highland, small-scale irrigation from hand-dug wells is practiced. In order to expand the small-scale irrigation system, a programme of small dam construction has been implemented since 1977.

In the pre-independence era [1977-88], about 77 dams with different capacities had been constructed in five provinces, Akeleguzai, Hamasen, Semhar, Senhit and Seraye, by the then Ministry of Agriculture, the Relief and Rehabilitation Commission [RRC], the Eritrean Lutheran World Federation [LWF] and the Catholic Secretariat [Government of Ethiopia, 1989]. After independence the number of dams have increased to 109 dams, this time by the Eritrean Ministry of Agriculture, The Eritrean Relief and Rehabilitation Agency [ERRA] and the above mentioned non government agencies.

Table: 13 Pre and Post Independence Dams		
Region	No of dams	Total capacity m ³
Asmara	1	800,000
Akeleguzai	23	5,437,000
Hamasien	55	9,926,000
Sahel	1	--
Semhar	3	1,510,000
Senhit	4	890,000
Seraye	22	5,528,992
Total	109	23,091,992
Source Derived from "Statistical Abstract of Eritrea Autonomous Region" [1984/82-1987-88], and FAO "Agricultural Sector Review and Project Identification" [April 1994]		

Note: 1. The capacity figure for Hamasen for the post- independence era is only for 46 dams.
2. The capacity figure for Seraye for the post -independence era is only for 18 dams

c.3 Agricultural System

c.3.1 Land Tenure

The term land tenure refers to the system of land ownership and management. The productivity in agriculture mainly depends on two sets of factors - technological and institutional. The technological factors consist of the use of agricultural inputs and methods, which help to raise productivity, such as improved seeds, modern machinery, fertilizers, irrigation etc. The institutional factors include the reformation of land tenure from the viewpoint of social justice and optimum utilization of land.

The existing land tenure systems in Eritrea are much of historical and traditional systems, rather than a practical one. Mainly there are three types of land ownership: [i] State Ownership or *Terre Domaniale*, [ii] Village ownership and [iii] Family system of ownership.

i. State Ownership

By the Italian Land Status of 1909, the “*Ordinamento Fondario*” [revised 1926], all lands below 350 meters altitude in the eastern lowlands and below 850 meters altitude in the western lowlands were declared property of the *Crown*, i.e. state land. Prior to this Status, more than 70 thousand hectares were confiscated [Leonard, 1982; United Nations, 1977].

In the November 1994 Macro-Policy of the Government of the State of Eritrea, the Government stated under Land Policy that the state has exclusive ownership right over all land within its territories and that every Eritrean citizen and all foreign investors have the right of access to land for farming, pasture, housing and development purposes. In the high altitude southern areas of the central highlands, most of the state land is in the immediate surrounds of the capital city Asmara; with about 6000 hectares in the eastern escarpment green belt.

ii. Village Ownership

Village ownership system, also known as “*Diesa*”, is predominantly in the highland provinces. The ownership of land under this system is of two types: Ownership of land by a single village and ownership of land by several villages. Ownership of land by single village has evolved from the family ownership system in Hamasen and northern Akeleguzai provinces prior to the Italian Colonization. Under this system the land surrounding a village is considered a common property of the community.

Ownership of land by several villages was introduced by the *Derg* regime. Under this system, two or more villages were joined to form a new administrative unit “*Kebele*” and the land in each *Kebele* was distributed among its inhabitants. Under this system, the size of land allotted to each family depended upon the size the family. The larger the family - the greater the land. This system is still in operation in Seraye province.

iii. Family Ownership

The family tenure system was originally practiced by the original settlers of the area in about 2000 BC. The main objective behind the evolution of this system was to ensure land availability for all descendants of the original settler at any future time. Mainly this system takes two forms:

- Hereditary ownership: known as [*teslimi*], still existing in parts of Senhit province. Under this system the title of ownership passes from father to sons who possess full right of ownership for the lifetime.
- Collective ownership system [*Collective risti*]: in which family members are given only usufruct right, title being held by the family council. After the reforms introduced by the *Derg* this system has almost disappeared.

Currently, there have been no land reforms taken place in Eritrea. The above-mentioned old land tenure systems are still being practiced in most of the regions of Eritrea.

c.3.2 Cultivation System

In general, the cultivation system in Eritrea is highly traditional and depends on rainfall, which is highly variable and erratic. Farmers adopt traditional and inefficient methods and techniques of production. Land preparation, tilling, harvesting and threshing are all done manually or with the help of animals. Modern inputs and modern varieties are not yet used in cultivation. Population pressure and smallholding of subsistence farms are the main characteristics of the Eritrean farming system. Rain-fed crop production is predominantly in the central highlands and irrigated crop production is practiced in parts of the eastern and western lowlands.

i. Rain-fed Crop Production:

Barley, Wheat, Field beans and chick pear are the main rain-fed crops, which dominate in higher altitudes, while taff dominates lower levels. At lower altitudes, sorghum and *finger millet* are the important crops, with the later being dominant throughout because of its ability to resist drought and its strong demand.

ii. Irrigated Crop Production

Horticulture crops are the main irrigated crops. Fruits and vegetables are cultivated in parts of Akeleguzai and the western lowlands under perennial irrigation. In Seraye and Hamasen, vegetables alone are the dominant crop.

Beside horticulture crops, *sorghum*, *millet* and *maize* are also cultivated under seasonal irrigation in different parts of the country. Cotton is also an important cash crop, cultivated under regulated irrigation at Alighider estate on the lower Gash [See Table: 12 above].

c.4 Livestock

Livestock is an important source of income for a nation and an important factor in the development equation. Livestock production in some developed countries gains more importance than crop production. In recent years, the share of livestock production in the total agricultural output in some West European countries has reached at 60 to 80 percent.

In the past, Eritrea's principal source of natural wealth had always been its livestock. Eritrea once used to export cattle and sheep to Saudi Arabia and canned and frozen meat to other countries. After the success of the veterinary service which was developed by the Italians in 1905, in eliminating the principal animal diseases; the number of animals in the country had increased from 1,109, 000 head to 2,784,485 heads between 1905 and 1928 [Leonard, 1982; United Nations, 1977].

In 1992, the total number of livestock was estimated at 1,258,000. The livestock sub sector is in a reasonably efficient and robust state. The livestock resources account for a major portion of rural household incomes especially in the lowlands, and contributed on an average a significant share of 41 percent [1992-2000] to the total agriculture production. The livestock sub-sector has more significance and wider scope, provided it is given proper care and special consideration.

3.4 Industrial Sector

Industrialisation has a major role to play in the development of the developing countries. As a matter of fact, though initially industry served as the leading sector of growth in almost all developed countries, fast economic development everywhere has been made possible essentially due to rapid industrialisation.

The gap in per capita incomes between the developed and developing countries is largely reflected in the structure of their economies. Developed countries are highly industrialised, while in developing economies generally agriculture dominates. Once the industrial base is set up and the production cycle begins its rotation, the industrial sector becomes capable of securing its continuation because of two main factors within the sector, viz.

- i. Because the productivity of labour in the industrial sector is much higher than in agricultural sector,
- ii. Because the surplus created in the industrial sector are relatively more easily available for investment than surpluses in the agricultural.

Hence, these two important factors favour rapid industrialisation as a means to achieve economic development provided that the role of agriculture in industrialisation is taken into consideration.

The Eritrean economy is relatively diversified in comparison to other sub-Saharan African countries. In the past, Eritrea was one of the industrial countries in the region. Even today, Eritrea has abundant natural resource and the ability to retain the same position.

The present section discusses Eritrea's industrial sector covering the following relevant issues:

- a. Industrial Development in Eritrea,
- b. Composition and Growth of Industrial Production,
- c. Industrial Profile.

a. Industrial Development In Eritrea

The Industrial evolution in Eritrea began as a political necessity under the Italian colonisation. With the Italian Occupation of Ethiopia in May 1936 from its colonies, Eritrea and Somali land, the Italian East Africa came into existence as a political unit.

As a natural consequence to the political changes in the region, Eritrea, because of its geographical location, became the base for the intensive economic development programme undertaken by the Italians in their newly acquired territory [Trevaskis, 1960].

It was during that era [1936-40] that the industrial development begun in Eritrea. According to a census taken at the end of April 1939, there existed in Eritrea 2,198 industrial undertakings with a total capital of 2,198 million Italian lire. Of which, 846 were transport enterprises with a capital of 1,518 million lire, 624 were concerned with constructional works and materials and had a total capital of 553 million lire. The remaining 728 enterprises with a capital of 127 million lire, comprised flour mills and pasta factories, ice plants, printers, wood and furniture factories, chemical factories, tanneries, textile producers and electrical workshops.

During the early years of the Second World War, the industrial sector and the economy in general, somewhat started suffering. With the Italian defeat by the Allies, the Eritrean industrial sector got a second chance for development, however for political necessity rather than for economic development. In the early years of the occupation, the Allies had taken steps to make Eritrea a supporting military base to secure their position in North Africa. The large British and American projects such as the construction and expansion of Gura Air Port and the Naval base at Massawa had created much employment opportunities, mainly for Italians and introduced substantial new financial resources into Eritrea [Trevaskis, 1960].

The revival did not last long. By the middle of 1943, the position of the Allies in Africa was totally secured and in consequence, the American and British establishments were gradually closed down. By 1945, the British authorities dismantled and sold most of Eritrea's infrastructure bases and installations to Anglo-Egyptian, Sudan, Pakistan and the British Reopen company [Pankhurst, 1952].

Under the Ethiopian colonisation, the industrial sector suffered significantly and production declined specially in the mid 1970's onwards when more than 40 of the most important industrial enterprises were nationalised by the Derg regime. In spite of the destruction occurred to the industrial sector by the liberation war, mismanagement and neglect, Eritrea still continues to be one of the most industrialised countries of East Africa.

b. Composition and Growth of Industrial Production

b.1 Industrial Composition

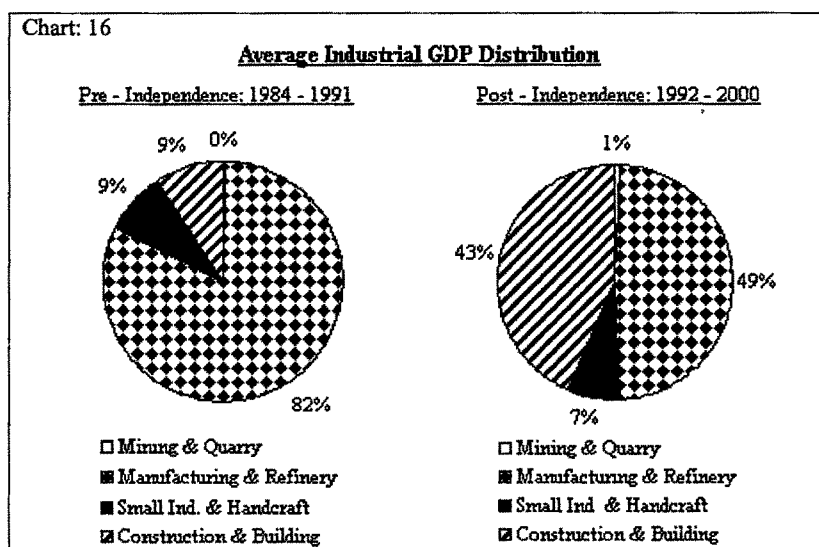
The industrial sector of Eritrea constitutes of the following four sub-sectors:

- i. Mining and Quarry,
- ii. Manufacturing and Refinery,
- iii. Small Scale Industry and Handicrafts,
- iv. Construction and Building.

Table: 14 and Chart: 16 show the composition of the industrial sector of Eritrea. As it is evident from this table, the share of each industrial sub-sector in total industrial production for the pre and post independence eras has been as follows:

- i. The share of mining and quarry in total industry has remained marginal during both the pre and post independence periods and has shown a falling tendency. In the pre independence period it fluctuated in the range of 0.3 to 0.4 percent. While in the post independence period it declined from 0.9 percent in 1994 to 0.4 percent in 1997 and then after remained stable at 0.4 percent till the year 2000. On an average, the share of mining and quarry sector in total industry has been very marginal at 0.3 percent and 0.6 percent in the pre and post independence periods respectively.
- ii. Manufacturing and refinery has been the leading sector and assumed an important position within the industrial sector during both, the pre and post independence periods. The share of this sector in total industry had remained in the range of 80 to 85 percent during 1984 to 1991. While in the post independence period, it has sharply declined from 73.9 percent in 1992 to 38.8 percent in the year 2000. On an average, the share of mining and quarry in total industry has declined from 81.9 percent in the pre independence period to 49 percent in the post independence period.
- iii. The contribution of small-scale industry and handcraft to the total industrial GDP has been very little throughout the pre and post independence periods. During the pre and post independence periods, the average share of this sector has been 8.6 percent and 7.2 percent respectively.
- iv. The share of construction and building sector in the overall industry occupies the second place coming next to manufacturing and refinery. During the pre independence period the contribution of this sector to total industrial GDP remained in the range 7.7 to 10.8 percent, thus, recording an average share contribution of 9.2 percent. But, in post independence its contribution has continued to increase significantly. From 1992 to 2000, it increased from 17.1 percent to 54.1 percent, and thus, rising the average share to 43.3 percent.

Table: 14 Composition of Industrial Production					
As percentage of total industry					
Era	Years	Mining & Quarry	Manufacturing & Refinery	Small Ind. & Handcraft	Construction & Building
Pre-Independence	1984	0.4	80.4	9.0	10.2
	1985	0.4	79.7	9.1	10.8
	1986	0.2	85.7	6.4	7.7
	1987	0.3	81.6	8.3	9.8
	1988	0.3	85.0	6.9	7.8
	1989	0.4	81.9	8.6	9.1
	1990	0.4	80.3	10.3	9.0
	1991	0.3	80.3	10.3	9.0
	Average	0.3	81.9	8.6	9.2
Post-Independence	1992	0.7	73.9	8.3	17.1
	1993	0.9	63.6	6.9	28.6
	1994	0.9	56.1	7.8	35.2
	1995	0.7	52.6	7.9	38.8
	1996	0.5	39.3	7.0	53.2
	1997	0.4	38.8	6.7	54.1
	1998	0.4	38.8	6.7	54.1
	1999	0.4	38.8	6.7	54.1
	2000	0.4	38.8	6.7	54.1
	Average	0.6	49.0	7.2	43.3



b.2 Industrial Growth

Table: 15 and 16 show the growth in industrial production by sub-sectors in millions of Nak'fa and its annual growth rates respectively. Chart: 17 and 18 present a graphical vision of the figures in Table: 15 and Chart: 19 and 20 present the pre and post independence annual growth rates in industrial sub-sectors respectively. From the study of the figures in the Tables and Charts the following observations may be made:

- i. Mining and quarry has remained the smallest sector throughout the pre and post independence period. The pre independence growth in this sector almost remained stagnant increasing only by 0.1 million Nak'fa from 1984 to 1991. The registered annual growth rate for this period fluctuated from as low as -20 percent in 1986 to as high as 12.5 in 1987, while in some years, registering zero percent growth.

In the post independence period, this sector has shown little improvement. It increased from 2.0 million Nak'fa in 1992 to 5.8 million Nak'fa in 2000. During this period, the annual growth rate declined from 100 percent in 1993 to zero percent in 1996 before rising again to 13.0 percent in 1999

- ii. Manufacturing and refinery has always remained the largest sub-sector within the industrial sector in the pre as well as post independence period. Before independence, the growth in this sector was not stable. It grew from 198.6 million Nak'fa in 1984 to its highest level of 324.7 million Nak'fa in 1986. Then after it started to decline, reaching at 219.4 million Nak'fa in 1990. The annual growth rate during this period fell from 60.2 percent in 1986 to -28.3 percent in 1990, showing high fluctuations in between.

In the post independence period, manufacturing and refinery has significantly grown to more than double from 210.7 million Nak'fa in 1992 to 506.0 million Nak'fa in the year 2000. The annual growth rate in this period highly fluctuated from 27.5 percent in 1993 to -4.2 percent in 1996, becoming stable at about 12.3 percent from 1998 to 2000.

- iii. In the pre independence period, small-scale industries and handcrafts sector grew marginally from 22.3 million Nak'fa in 1984 to 32.6 million Nak'fa in 1991. The annual growth rate in this period remained more or less stable between 3.5 percent and 3.9 percent for the years 1985 to 1988. In 1989, it fell sharply to 0.4 percent and then after registered a significant rise to 8.5 percent in 1990 and to 16 percent in 1991.

After independence, the small-scale industries and handcrafts sector got a boost to grow significantly from 23.8 million Nak'fa in 1992 to 87.4 million Nak'fa in the year 2000. The annual growth rate in this period increased from 21.8 percent in 1993 to 31.2 percent in 1995, after which it declined sharply to -12.5 percent in 1996 and then after increased significantly to 14.3 percent in 1997. Between 1998 to 2000, it remained stable at 12.3 percent.

- iv. Construction and building sector is the second largest sector after manufacturing and refinery sector. In the pre independence period, growth in this sector was very little. In a period of these eight years, it grew only from 25.2 million Nak'fa in 1984 to 28.7 million Nak'fa in 1991. The annual growth rate during this period showed a continuous decline, falling sharply from 9.1 percent in 1985 to -11.2 percent in 1990.

After independence, this sector has seen a significant growth due to the vast reconstruction and building activities that took place after liberation. During this period, the construction and building sector grew very significantly from 48.7 million Nak'fa in 1992 to 705.5 million in the year 2000. While the annual growth rate during the same period has shown high fluctuations, falling sharply from 148.3 percent in 1993 to 36 percent in 1994, and then rising to 76.1 percent in 1996 before falling again to 12.3 percent in 1998. From 1998 to 2000 it remained stable at 12.3 percent.

- v. Within the industrial sector, in post-independence, fastest growing sector has been construction [11.2 percent] followed by small industries [6.5 percent], manufacturing [4.1 percent] and mining [2.2 percent] in that order, as indicated by the stimulated trend growth equations. The growth rates in these industrial sub-sectors have not been very volatile which is a good sign from policy planning perspective.

Table: 15 Industrial Production In Millions of Nak'fa						
Era	Years	Mining & Quarry	Manufacturing & Refinery	Small Ind. & Handcraft	Construction & Building	Total
Pre-Independence	1984	1.0	198.6	22.3	25.2	247.1
	1985	1.0	202.7	23.1	27.5	254.3
	1986	0.8	324.7	24.0	29.4	378.9
	1987	0.9	245.0	24.9	29.3	300.1
	1988	1.0	316.8	25.8	29.2	372.8
	1989	1.1	247.7	25.9	27.6	302.3
	1990	1.1	219.4	28.1	24.5	273.1
	1991	1.1	254.1	32.6	28.7	316.5
Post-Independence	1992	2.0	210.7	23.8	48.7	285.2
	1993	4.0	268.7	29.0	120.9	422.6
	1994	4.0	261.5	36.5	164.4	466.4
	1995	4.1	318.1	47.9	234.3	604.4
	1996	4.1	304.7	53.9	412.5	775.2
	1997	4.1	356.8	61.6	497.5	920.0
	1998	4.6	400.9	69.2	558.9	1033.6
	1999	5.2	450.4	77.8	628.0	1161.4
	2000	5.8	506.0	87.4	705.5	1304.7
Growth Rates		2.2	4.1	6.5	11.2	7.3

Trend Equations: 1993 to 2000

$$\begin{aligned}
 \text{Log [Mining \& Quarry]} &= 0.549 + 0.022 t & R^2 &= 0.779 & F &= 21.230 \\
 &[22.75] & [4.60] \\
 \text{Log [Manufact. \& Refiner]} &= 2.357 + 0.041 t & R^2 &= 0.949 & F &= 112.07 \\
 &[119.45] & [10.58] \\
 \text{Log [Small Ind. \& Hcrafts]} &= 1.440 + 0.065 t & R^2 &= 0.969 & F &= 189.57 \\
 &[59.62] & [13.76] \\
 \text{Log [Const. \& Building]} &= 2.038 + 0.112 t & R^2 &= 0.926 & F &= 76.017 \\
 &[31.16] & [8.71] \\
 \text{Log [Industry]} &= 2.559 + 0.073 t & R^2 &= 0.976 & F &= 252.031 \\
 &[109.33] & [15.87]
 \end{aligned}$$

Table: 16 Industrial Annual Growth Rates						
In Percentage						
Era	Years	Mining & Quarry	Manufacturing & Refinery	Small Ind. & Handcraft	Construction & Building	Total
Independence	1984	--	--	--	--	--
	1985	0	2.1	3.6	9.1	2.9
	1986	-20.0	60.2	3.9	6.9	49.0
	1987	12.5	-24.5	3.5	-0.3	-20.8
	1988	11.1	29.3	3.6	-0.3	24.2
	1989	10.0	-21.8	0.4	-5.5	-18.9
	1990	0.0	-28.3	8.5	-11.2	-9.7
	1991	0.0	15.8	16.0	17.1	15.9
	Average	1.9	4.7	5.6	2.3	6.1
	Standard Deviation	11.2	32.8	5.1	9.5	25.4
	Volatility	5.8	7.0	0.9	4.2	4.2
Post-Independence	1992	--	--	--	--	--
	1993	100.0	27.5	21.8	148.3	48.2
	1994	0.0	-2.7	25.9	36.0	10.4
	1995	2.5	21.6	31.2	42.5	29.6
	1996	0.0	-4.2	-12.5	76.1	28.3
	1997	0.0	17.1	14.3	20.6	18.7
	1998	12.2	12.4	12.3	12.3	12.4
	1999	13.0	12.3	12.4	12.4	12.4
	2000	11.5	12.3	12.3	12.3	12.3
	Average	17.4	12.0	14.7	45.1	21.5
	Standard Deviation	33.9	10.9	13.1	47.1	13.1
	Volatility	1.9	0.9	0.9	1.0	0.6

Chart: 17

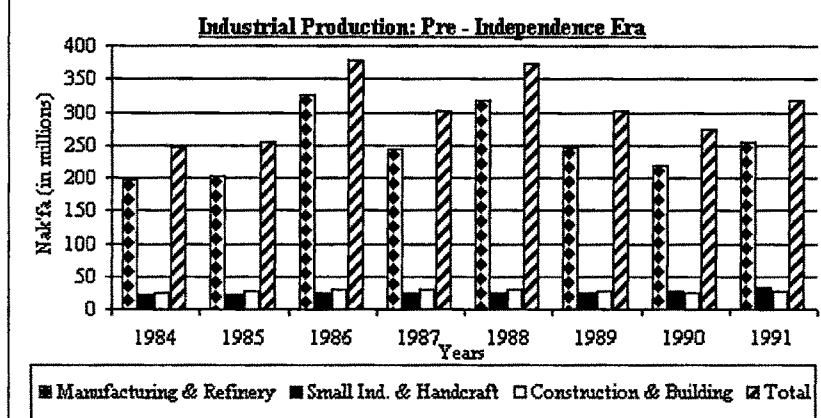


Chart: 18

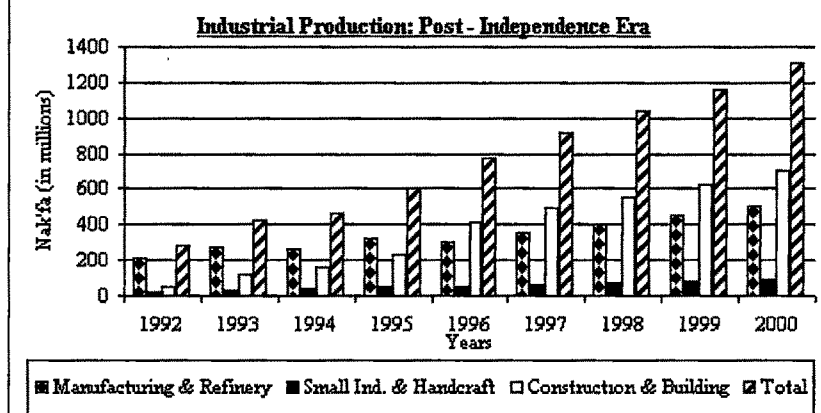
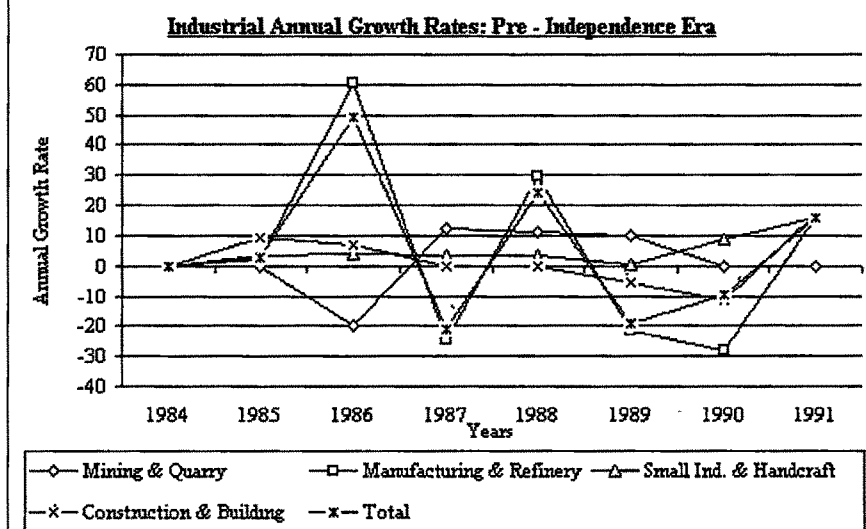
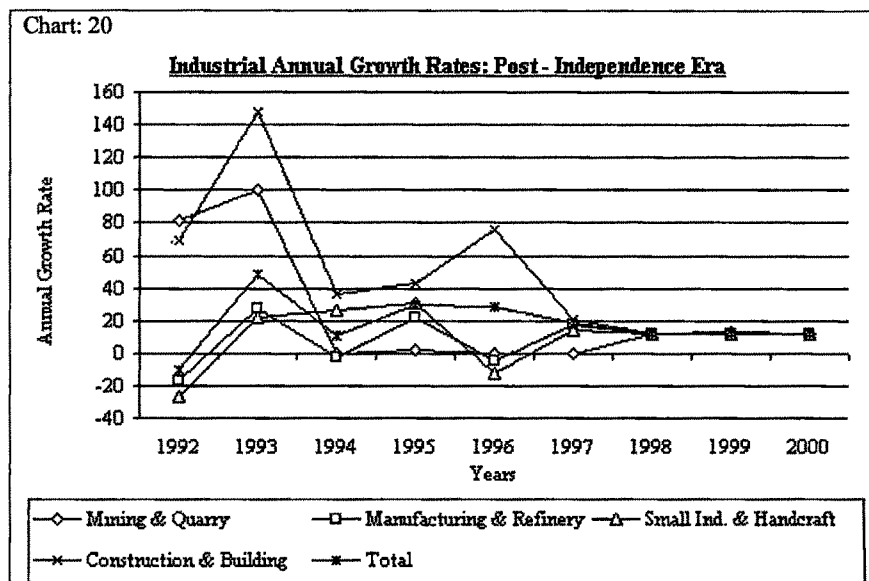


Chart: 19





c. *Industrial Profile*

On the eve of the independence, Eritrea inherited 42 public industries [most of them in non-operational condition] and 645 private industries. Broadly, the public industries of Eritrea may be classified product-wise into nine categories, each category containing a number of factories. The nine categories are: food processing industries, Beverages, Chemicals, Textiles, Leather and Shoe, Metal and Wood, Printing and Paper, non-metallic minerals and Tobacco industries. The private industries may also be classified into the same categories excluding Tobacco industries.

c.1 Public Sector Industries

The public industries consist of 42 industries most of them being very old. Of these, ten industries were established during the Italian colonisation [1901-1939], nine enterprises during the British occupation [1942-50], eleven during the Eritrean federal Government [1952-61] and ten industries during the Ethiopian colonisation [1963-72]. As regards the establishment date for the remaining two industries there is no available information.

On the eve of the independence, most of the 42 public industries were in non-operational condition because of the destructive war conditions. After independence, the public industries were put into operation at an average capacity utilisation rate of 22

percent. These public enterprises are much larger than the private enterprises, employing on an average more than 250 employees, with an average capital investment of 2.2 million Nak'fa.

Product wise, out of the 42 public enterprises, 6 are food processing industries, 3 beverage, 5 chemical, 5 textiles, 5 leather and shoe, 10 metal and wood, 3 printing and paper, 1 tobacco and 4 non-metal factories. Table: 17 shows the classification of the public industries product wise.

Table: 17 Eritrea's Public Sector Industries	
Category	No. of Industries
Food Processing	6
Beverage	3
Chemical	5
Textiles	5
Leather & Shoe Products	5
Metal & Wood Products	10
Printing Press & Paper	3
Non-Metal Products	4
Tobacco	1
Total	42
<small>Source: Derived from Government of Ethiopia, "Statistical Abstract of Eritrea Autonomous Region 1984/85 - 1987/88", Government of Eritrea, Ministry of Trade and Industry, "Unpublished Documents".</small>	

c.2 Private Sector Industries

The number of private sector industries increased from 645 industries in the pre-independence era to 1,267 enterprises in the post-independence era. Private industries are mostly small in size, with average employment of six workers and total capital investment of 137.30 million Nak'fa.

Product wise, the 1,267 private industries consists of 656 food processing industries, 8 beverage, 39 chemical, 89 textiles, 30 leather and shoe, 333 metal and wood, 17 printing and paper and 95 non-metallic factories. Table: 18 shows the distribution of the private industries product wise.

Table: 18 Eritrea's Private Sector Industries

Category	Pre Independence	Post Independence	Total
Food Processing	314	342	656
Beverage	8	0	8
Chemical	36	3	39
Textiles	88	1	89
Leather & Shoe Products	25	5	30
Metal & Wood Products	113	220	333
Printing Press & Paper	15	2	17
Non-Metal Products	26	69	95
Tobacco	0	0	0
Total	645	622	1267

Source Derived from Government of Ethiopia, "Statistical Abstract of Eritrea Autonomous Region 1984/85 – 1987/88"; Government of Eritrea, Ministry of Trade and Industry, "Unpublished Documents"

c.3 Industrial Location

About 47 percent of the private enterprises are located in Asmara alone and 30 percent in the three highlands regions, Hamasen, Seraye and Akeleguzai, while the remaining 23 percent are distributed in the lowlands regions except Dankalia region. Regarding the public enterprises, except six, all are located in the capital city Asmara. Table: 19 shows the locations of the public and private industries of Eritrea.

Table: 19 Location of Private and Public Industries

Region	Private Industries		Public Industries
	Pre – Indep.	Post – Indep.	
Asmara [Capital city]	465	593	36
Akeleguzai	19	140	1
Barka	1	18	1
Dankalia	0	0	0
Gash-Setit	0	98	0
Hamasen	39	91	2
Sahel	0	25	0
Semhar	13	43	0
Senhit	38	114	1
Seraye	70	145	1
Total	645	1,267	42

Source Derived from Government of Ethiopia, "Statistical Abstract of Eritrea Autonomous Region 1984/85 – 1987/88"; Government of Eritrea, Ministry of Trade and Industry, "Unpublished Documents"

3.5 Services Sector

The services sector is the largest sector within all the sectors of the Eritrean economy. Its average percentage share in the total economy has been around 40 percent in the last one decade. The task of this topic is to analyse the composition and growth within the services sector.

a. Composition and Growth of Services Sector

a.1 Service Sector Composition

The services sector in Eritrea consists of four sub-sectors namely:

- i. Distribution Services,
 - Wholesale Trade
 - Retail Trade
 - Hotel and Restaurants
- ii. Public Administration,
- iii. Domestic Services
 - Real Estate
 - Housing
 - Other Domestic Services
- iv. Others.

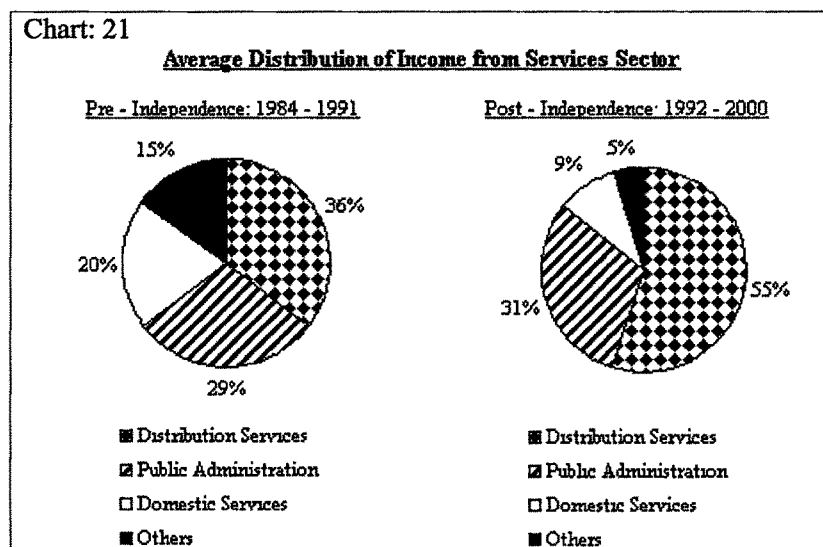
Table: 20 and Chart: 21 show the composition of the services sector. The study of the figures given in Table: 20 reveals the following observations:

- i. Distribution services has always been the major sector within the services sector. Its share in total services during the pre independence period declined substantially from 40.4 percent in 1984 to 29.1 percent in 1991, recording an average percentage share of 35.4 percent for the period 1984 to 1991. In the post independence period, the share of distribution in total services income declined slightly from 58.5 percent in 1992 to 55.6 percent in 2000. This stable rate made the distribution service sector contribute on an average 55.1 percent in the post independence period.
- ii. The share of public administration in total services showed a continuous rise in the pre independence period. It increased from 24.3 percent in 1984 to 36.4 percent in 1991, and hence contributed on an average a share of 29.4 percent. During the post independence period, the share of this sector remained more or less on the same level. It remained stable in the range of 29 to 31 percent throughout 1991 to 2000, except a jump to 35.2 percent in 1994.
- iii. The average share of domestic services in the total service sector has significantly retreated to almost halve in the post independence period. It fell sharply from 19.9 percent in the pre independence period to 9.2 percent in the

post independence period. Before independence, the share of domestic services in the total service sector had remained stable in the range of 18.8 percent to 21.2 percent. While after independence, it increased from 6.5 percent in 1992 to 10.2 percent in 1994, after which it maintained its stability, but at a lower range of 9.5 to 10 percent from 1995 onwards.

Table: 20 Composition of Income from Services Sector					
As percentage of total Services Income					
Era	Years	Distribution Services	Public Administration	Domestic Services	Others
Pre-Independence	1984	40.4	24.3	20.5	14.8
	1985	38.6	26.0	20.8	14.6
	1986	42.4	24.1	19.2	14.3
	1987	36.6	29.3	19.1	15.0
	1988	36.1	29.6	19.3	15.0
	1989	32.3	30.0	21.2	16.5
	1990	27.8	35.3	20.4	16.5
	1991	29.1	36.4	18.8	15.7
	Average	35.4	29.4	19.9	15.3
Post-Independence	1992	58.5	28.9	6.5	6.1
	1993	57.0	30.3	7.4	5.3
	1994	50.3	35.2	10.2	4.3
	1995	54.2	31.4	10.0	4.4
	1996	53.7	32.3	9.5	4.5
	1997	55.6	29.6	9.9	4.9
	1998	55.6	29.6	9.9	4.9
	1999	55.6	29.6	9.9	4.9
	2000	55.6	30.7	9.9	3.8
	Average	55.1	30.8	9.2	4.8

Chart: 21



a.2 Services Sector Growth

Table: 21 and 22 show the pre and post independence growth in income from services sub-sectors [at current factor cost] in millions of Nak'fa and the annual growth rates respectively. Chart 22 and 23 present a graphical vision of the figures in Table: 21. Chart: 24 and 25 present the pre and post independence annual growth rates in income from services sub-sectors respectively. From the study of the figures in the Tables and Charts the following observations may be made:

- i. The distribution sector is the largest sector within the services sector. Before independence, it showed a growth from 84.2 million Nak'fa in 1984 to 106.3 million Nak'fa in 1986, after which it started to decline recording several fluctuations before reaching at 103 Million Nak'fa in 1991. During the same period, the annual growth rate showed violent fluctuations ranging from as high rate as 24.9 percent in 1986 to -11.4 percent in 1989.

In the post independence period, this sector grew significantly from 455.1 million Nak'fa in 1992 to 1,437.9 million Nak'fa in 2000, which is more than three times. During this period, the annual growth rate declined from 27.3 percent in 1993 to 12.4 percent in the year 2000. In 1997 it registered its lowest level at 7.4 percent.

- ii. The public administration sector comes the second after the distribution sector in terms of size. In the pre independence period, it had grown continuously from 50.6 million Nak'fa in 1984 to 129.2 million Nak'fa in 1991. The annual growth rate during this period had not been stable as well. It fluctuated highly falling from 13.3 percent in 1985 to 5.8 in 1986, from 28.6 percent in 1987 to 0.4 percent in 1989 and then finally from 24.7 percent in 1990 to 21.8 in 1991. However, in spite these violent fluctuations, it always remained positive.

In the post independence period, public administration has shown a significant rise from 225.1 million Nak'fa in 1992 to 794.1 million Nak'fa in 2000. The annual growth rate in this period highly fluctuated from as high as 64.0 percent to as low as -5.1 percent.

- iii. Domestic services sector, the third within the services sector grew gradually but continuously from 42.8 million Nak'fa in 1984 to 66.6 million Nak'fa in 1991. Its annual growth rate during this period had been positive throughout. It also showed fluctuations falling from 7 percent in 1985 to 5.2 percent in 1986, then rising to 8.9 percent in 1988 and again falling sharply to 2.5 percent in 1990, before rising sharply to 8.5 percent in 1991.

After independence, the domestic services sector has continued to grow significantly from 51 million Nak'fa in 1992 to 256.2 million Nak'fa in the year 2000. The annual growth rate increased from 47.5 percent in 1993 to 94.8 percent in 1994, before falling sharply to 7.2 percent in 1996. After which it has

registered a rise to 12.4 percent in 1999. From 1998 to 2000 it remained stable at 12.3 percent.

- v. All the sub-sectors of the services sector of Eritrea's GDP have grown almost at the same rate of 5 percent, with very minor volatility in the annual growth rates.

Table: 21 Service Sector Growth In millions of Nak'fa						
Era	Years	Distribution Services	Public Administration	Domestic Services	Others	Total
Pre-Independence	1984	84.2	50.6	42.8	30.9	208.5
	1985	85.1	57.3	45.8	32.2	220.4
	1986	106.3	60.6	48.2	35.8	250.9
	1987	97.5	77.9	51.0	40.0	266.4
	1988	103.3	84.8	55.3	42.7	286.1
	1989	91.6	85.1	59.9	46.8	283.4
	1990	83.6	106.1	61.4	49.8	300.9
	1991	103.0	129.2	66.6	55.7	354.5
Post-Independence	1992	455.1	225.1	51.0	47.2	778.4
	1993	579.3	309.0	75.2	53.7	1017.2
	1994	724.1	506.8	146.5	61.1	1438.5
	1995	848.8	491.8	156.4	69.5	1566.5
	1996	944.0	568.0	167.7	79.1	1758.8
	1997	1013.9	538.8	180.7	90.0	1823.4
	1998	1139.1	605.3	203.0	101.1	2048.5
	1999	1279.8	680.1	228.1	113.6	2301.6
	2000	1437.9	794.1	256.2	127.6	2585.8
Growth Rates		5.2	4.4	6.0	5.3	5.0

Trend Equations: 1993 to 2000

$$\text{Log [Distribution Serv.]} = 2.745 + 0.052 t \quad R^2 = 0.979 \quad F = 280.973$$

[173.38] [16.76]

$$\text{Log [Public Admin]} = 2.534 + 0.044 t \quad R^2 = 0.822 \quad F = 27.751$$

[59.13] [5.26]

$$\text{Log [Domestic Sev.]} = 1.952 + 0.060 t \quad R^2 = 0.822 \quad F = 27.77$$

[33.83] [5.27]

$$\text{Log [Others]} = 1.679 + 0.053 t \quad R^2 = 0.999 \quad F = 9166.89$$

[591.59] [95.74]

$$\text{Log [Services]} = 3.017 + 0.050 t \quad R^2 = 0.939 \quad F = 92.573$$

[114.39] [9.62]

Table: 22 Service Sector Annual Growth Rates In percentage						
Era	Years	Distribution Services	Public Administration	Domestic Services	Others	Total
Independence	1984	--	--	--	--	--
	1985	1.1	13.3	7.0	4.2	5.7
	1986	24.9	5.8	5.2	11.1	13.8
	1987	-8.3	28.6	5.8	11.7	6.2
	1988	6.0	8.9	8.9	8.4	6.8
	1989	-11.4	0.4	8.3	9.6	-0.9
	1990	-8.7	24.7	2.5	6.4	6.2
	1991	23.2	21.8	8.5	11.9	17.8
	Average	3.8	14.8	6.6	9.0	7.9
	Standard Deviation	15.1	10.5	2.3	2.9	6.1
	<i>Volatility</i>	<i>3.9</i>	<i>0.7</i>	<i>0.3</i>	<i>0.3</i>	<i>0.8</i>
Post-Independence	1992	--	--	--	--	--
	1993	27.3	37.3	47.5	13.8	30.7
	1994	25.0	64.0	94.8	13.8	41.4
	1995	17.2	-3.0	75.0	13.8	8.9
	1996	11.2	15.5	7.2	13.8	12.3
	1997	7.4	-5.1	7.8	13.8	3.7
	1998	12.3	12.3	12.3	12.3	12.3
	1999	12.4	12.4	12.4	12.4	12.4
	2000	12.4	16.8	12.3	12.3	12.4
	Average	15.7	18.8	33.7	13.3	16.8
	Standard Deviation	7.0	22.5	34.6	0.8	12.6
	<i>Volatility</i>	<i>0.4</i>	<i>1.2</i>	<i>1.0</i>	<i>0.1</i>	<i>0.8</i>

Chart: 22

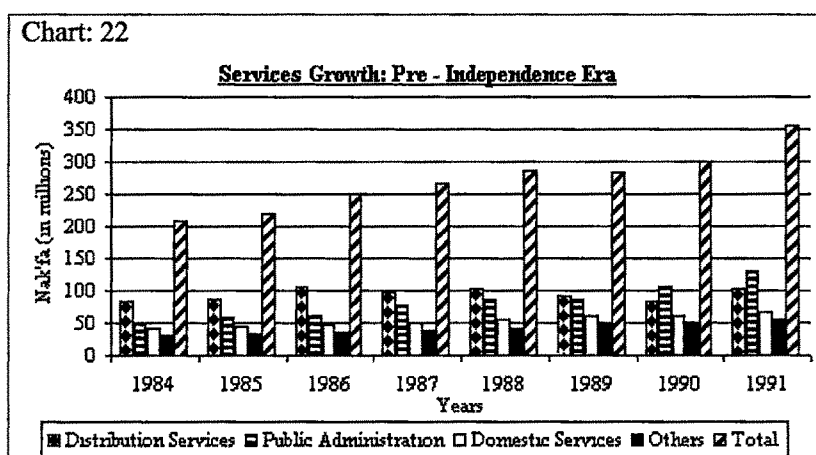


Chart: 23

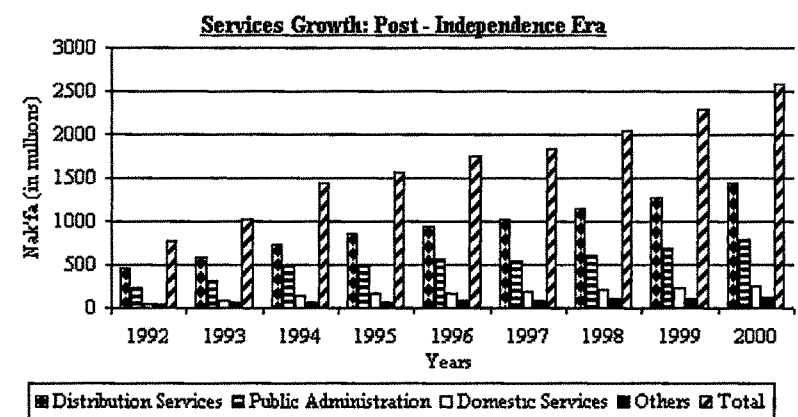


Chart: 24

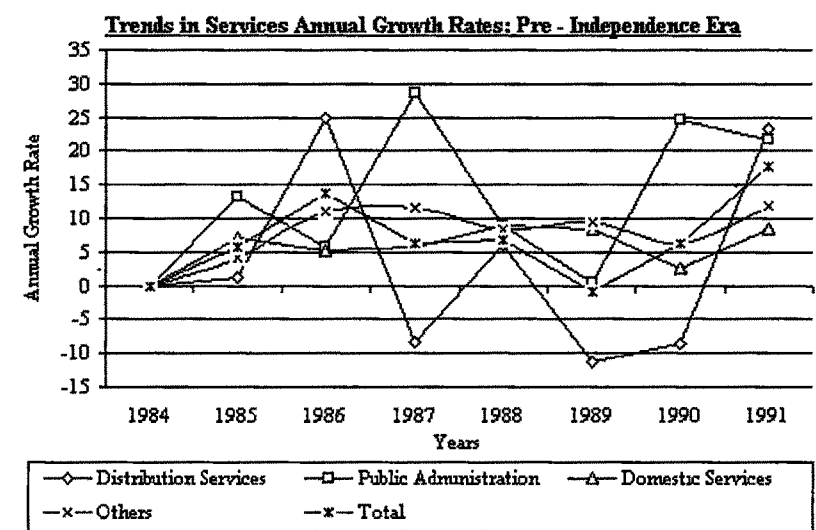
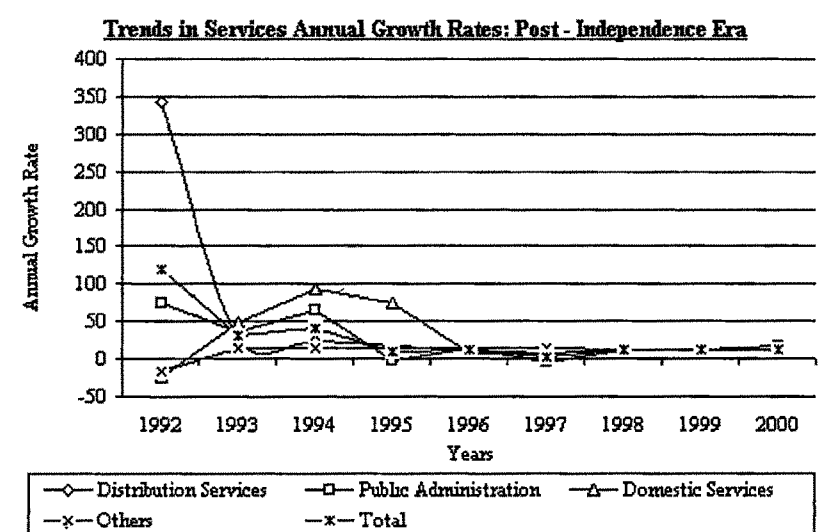


Chart: 25



3.6 Infrastructure

The prosperity of the economy depends directly upon the development of the infrastructure facilities. More often, infrastructure facilities are referred to as economic and social overheads.

In the absence of a proper infrastructure base, it is difficult for any economic sector to receive inputs, to produce goods and to dispose outputs. This is why investment in infrastructure can be considered as an indirect investment in all economic sectors. For production, both the agricultural as well as industrial beside machinery, equipment and skilled man-power; efficient management, energy, banking system, proper marketing facilities, communications and transportation services are required. These services are nothing but the infrastructural supports in an economy. Hence, the development and expansion of all these facilities and services is an essential pre-condition for increasing agricultural and industrial production in a country.

Moreover, the development of infrastructure services helps in reducing poverty and also in the acceleration of economic growth. Infrastructure services that help the poor also contribute to environmental sustainability. Clean water and sanitation, non-polluting sources of power such as biogas and solar energy, safe disposal of solid waste, and better management of traffic in urban areas confer environmental benefits on all income groups. The urban poor often benefit most directly from good infrastructure services because the poor are concentrated in settlements subject to unsanitary conditions, hazardous emissions and accident risks. In many rapidly growing cities of developing countries, infrastructure expansion is lagging behind population growth causing local environments to deteriorate [World Development Report, 1994]

Though improving infrastructure services is key to poverty alleviation and achieving economic growth, for most developing countries – despite improvements in access – the quantity and quality of services are well below what is demanded [Finance and Development, 1994]. In spite of massive infrastructure investment year after year, the performance of infrastructure in many developing countries, including Eritrea, has been disappointing in several respects. In most developing countries, nearly all infrastructure

facilities are built, owned and operated by governments. Primarily, because the provision of infrastructure services require huge investments with high uncertainty of returns which hinders private firms to participate. Secondly, because the nature of infrastructure services and the public interest involved are thought to require monopoly. As such, the assessment of success or failure in infrastructure in developing countries is largely a story of government's performance.

In the 1940s, Eritrea had a relatively well-developed infrastructure. During the British occupation, most of the infrastructure base had been dismantled and sold to the then Anglo-Egyptian Sudan, Pakistan and to British private Companies [Pankhurst, 1952; Trevaskis, 1960]. Since then, whatever infrastructure remained had seriously been damaged by the colonial neglecting policy and by decades of destructive liberation war.

In addition to the general problems of infrastructure in developing countries, the infrastructure sector in Eritrea has suffered many problems due to the long years of colonisation policies, and the destructive liberation war. This topic studies the Structure and Growth of infrastructure sector in Eritrea's GDP.

a. Composition and Growth of Infrastructure

a.1 Composition of Infrastructure Sector

The income from infrastructure sector in Eritrea may be classified into four sub-sectors as following:

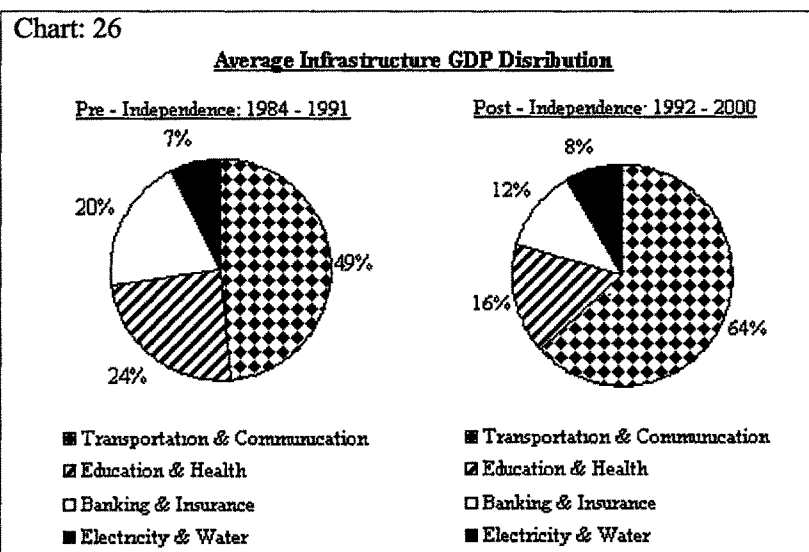
- i. Transportation and Communication
- ii. Health and Education
- iii. Banking, Finance and Insurance
- iv. Electricity, Water and Energy

Now, let us first examine the income share of each sub-sector in total income from infrastructure.

Table: 23 and Chart: 26 show the composition of the infrastructure sector of Eritrea. As it is evident from this table, the share of each infrastructure sub-sector in total infrastructure in the pre and post independence periods has been as follows:

- i. Transportation and communication sector is the largest within the infrastructure sector. Its share in total infrastructure has shown a falling tendency during both the pre and post independence periods. In the pre independence period it declined from 52.9 percent in 1984 to 40.6 percent in 1991. While in the post independence period, it declined from 70 percent in 1992 to 59.2 percent in 1997 and then after remained stable till the year 2000. On an average, the share of this sector in total infrastructure increased from 48.6 percent in the pre independence period to 63.5 percent in the post independence period.
- ii. Health and education sector assumes the second position within the infrastructure sector. The performance of this sector has significantly declined in the post independence period as compared to the pre independence period. During the pre independence period, the share of education and health in total infrastructure had achieved a moderate increase, rising from 22.2 percent in 1984 to 28.6 percent in 1991. While in the post independence period, it declined in the initial years from 16.2 percent in 1992 to 10.9 percent in 1996. Then after increased to 18.5 percent in 1997 to remain stagnant at this level till the year 2000. The average share of the income from this sector in the total infrastructure income has significantly declined from 24.2 percent in the pre independence period to 16 percent in the post independence period.
- iii. The financial infrastructure, which includes banking, financial institutions and insurance companies, plays an important role in the development and growth of an economy. The role of this sector in the Eritrean economy as well is vital and significant. Its average share in the total service sector has declined to 12.1 percent in the post independence period from 19.8 percent in the pre independence period. Before independence, it remained stable in the range of 19.3 to 21.6 percent, except for the years 1985 and 1986 where it had slightly fallen to 17.8 and 18 percent respectively. After independence also, it maintained its stability but at a lower level. It increased from 7 percent in 1992 to 14.8 percent in 1995 and then after remaining stable at 13.8 percent.
- iv. The average share of electricity and water sector in the total service sector, though expected to contribute more, did not change much after independence. It has only increased by one percent from 7.5 percent to 8.5 percent. Before independence, it increased from 4.7 percent in 1984 to 9.2 percent in 1991. While after independence, it increased initially from 6.8 percent in 1992 to 10.1 percent in 1993, before falling to 7.8 percent in 1995 and then after remained almost stable at 8.4 to 8.7 percent throughout.

Table: 23 Infrastructure Composition As Percentage of Total Infrastructure					
Era	Years	Transportation & Communication	Education & Health	Banking & Insurance	Electricity & Water
Pre-Independence	1984	52.9	22.2	20.2	4.7
	1985	52.6	23.2	17.8	6.4
	1986	53.3	22.0	18.0	6.7
	1987	48.8	22.6	21.4	7.2
	1988	50.7	22.5	19.3	7.5
	1989	47.6	24.4	19.5	8.5
	1990	41.9	27.9	20.8	9.4
	1991	40.6	28.6	21.6	9.2
	Average	48.6	24.2	19.8	7.5
Post-Independence	1992	70.0	16.2	7.0	6.8
	1993	67.9	14.5	7.5	10.1
	1994	65.2	14.8	11.2	8.8
	1995	64.1	13.3	14.8	7.8
	1996	67.1	10.9	13.3	8.7
	1997	59.2	18.5	13.8	8.5
	1998	59.2	18.6	13.8	8.4
	1999	59.2	18.5	13.8	8.5
	2000	59.2	18.5	13.8	8.5
	Average	63.5	16.0	12.1	8.5



a.2 Infrastructure Growth

Table: 24 and 25 show the pre and post independence growth in GDP from infrastructure sub-sectors in millions of Nak'fa and the annual growth rates respectively. Chart 27 and 28 present a graphical vision of the figures in Table: 24. While Chart: 29 and 30 present the pre and post independence annual growth rates in infrastructure sub-sectors respectively. From the study of the figures in the mentioned Tables and the Charts, the following observations may be made:

- i. Transportation and Communication are indispensable for the exchange of goods and services, on which the modern society depends. In the absence of transportation the economic sectors cannot function because it would not be possible to obtain materials and labour or distribute products. Both, the scale of production and the size of the market, depend on size and efficiency of the transportation system. Therefore, transportation is the nerve of the economy through which labour and materials circulate.

In modern life the communication system; comprising posts and telegraphs, telecommunication system, broadcasting, television and information services have become indispensable for the acceleration of the economic growth. The communication system helps to bring buyers and sellers together effectively by providing necessary information about the markets and by supplying necessary motivation. It also helps the growth in exports and facilitation of internal and external trade. Accordingly, the modern communication system has become an integral part of the development process.

In the pre independence period, Eritrea's transportation and communication sector had not grown so well. Income from this sector increased from 53.8 million Nak'fa in 1984 to 71.5 million Nak'fa in 1988 and then started to decline till it reached 54.6 million Nak'fa in 1991, which was almost back to the starting point. The annual growth rate during this period as well had witnessed violent fluctuations from as high as 10.6 percent in 1985 to as low as -19 percent in 1990.

After independence, the growth in this sector has shown a significant and continuous improvement, growing from 237.5 million Nak'fa in 1992 to 847.9 million Nak'fa in the year 2000. Thereby, recording though a highly fluctuating, but a positive annual growth rate throughout the post independence period. The annual growth rate fell sharply from 65.1 percent in 1993 to 7.7 percent in 1995, then after showing a significant rise to 17.8 percent before registering another sharp fall to 2.4 percent in 1997. From 1998 to 2000 the annual rate of growth remained stable at 12.4 percent.

- ii. Health and Education are important components of human welfare. From the economic point of view, the improvement in education and health status is an ultimate end in itself and an essential objective to secure sustained economic development and progress.

Health brings substantial economic benefits by increasing the capacity to learn and by raising productivity and prolonging potential working lives. Education, on the other hand, improves the capacity to produce and earn income and thereby improves efficiency which is a vital necessity for economic development and progress.

Therefore, better health and better education are desirable ends in themselves. Any investment or expenditure made for the improvement of health and education is considered as an investment and also the consumption expenditure at the same time and generally this investment or expenditure means the production of quality human resource [Eritrea's health and education status have already been discussed in Chapter: 2 of this study].

Before independence, Eritrea's health and education sector was not given a priority by the then ruling Ethiopian colonization. During that period, it increased from 22.6 million Nak'fa in 1984 to 38.4 in 1991. The annual growth rate fluctuated falling from 15.9 percent in 1985 to 3.1 percent in 1987 before starting to rise to 10 percent in 1991.

While in the post independence period, health and education sector has significantly grown due to the priority given to this sector. Education and health sector has grown from 54.8 million Nak'fa in 1992 to 265.6 million Nak'fa in the year 2000. The annual growth rate has shown high fluctuations, falling sharply in the beginning from 52.6 percent in 1993 to -15.3 percent in 1995, and then another sharp fall after significantly rising to 97.6 percent in 1997, to 12.3 percent in 1998. After 1998 onwards, the annual growth rate has maintained stability at 12.4 percent.

- iii. Banks, financial institutions and insurance companies play an important role in the development and growth of the economy by transferring funds from those who have excess funds to those who need funds. In addition, insurance services provide motives and incentives for entrepreneurs to overtake risk, which is the essence of economic development. As such, no sector in the economy, big or small, can run or exist without adequate finances.

In the pre independence period, Eritrea's banking, finance and insurance sector grew marginally from 20.5 million Nak'fa in 1984 to 27.3 million Nak'fa in 1988 and then after falling to 26 million Nak'fa in 1990, it increased to 29 million Nak'fa in 1991. During this period, the annual growth significantly jumped from -2 percent in 1984 to 19.8 percent in 1987, before sharply falling to -2.3 percent in 1990 and significantly rising again to 15.5 percent in 1991.

After independence, the growth in this sector has been very significant from 23.6 million Nak'fa in 1992 to 197.4 million Nak'fa in the year 2000. The annual growth rate during this period had sharply fallen from 83.5 percent in 1993 to 1.4 percent in 1996. Again, after rising significantly to 20 percent in 1997, it came down to 12.4 percent in 1998, to maintain stability at this annual growth rate till the year 2000.

- iv. Electricity and water sector is the platform of development. In Eritrea electricity and water sector increased from 4.8 million Nak'fa in 1984 to 12.3 million Nak'fa in 1991. The annual growth rate during this period sharply declined from 50 percent in 1993 to 6.7 percent in 1987, and again from 11.6 percent in 1988 to 1.7 percent in 1990.

After independence, perhaps due to the realization of necessity of this sector, it witnessed a significant growth. The growth in this sector has increased sharply from 23.2 million Nak'fa in 1992 to 120.9 million Nak'fa in the year 2000. The annual growth rate during this period fell from as high as 151.3 percent in 1993 to as low as -2.2 percent in 1995, and again after rising to 25.1 percent in 1996, it fell to 12.5 percent in the year 2000. From 1997 to 2000, the annual growth rate somehow remained stagnant between 12.3 to 13.2 percent.

- v. Infrastructure sector has witnessed quite a moderate growth rate in the post-independence period with a very negligible volatility.

Table: 24 Infrastructure Growth						
In millions of Nak'fa						
Era	Years	Transportation & Communication	Education & Health	Banking & Insurance	Electricity & Water	Total
Pre-Independence	1984	53.8	22.6	20.5	4.8	101.7
	1985	59.5	26.2	20.1	7.2	113.0
	1986	70.5	29.1	23.8	8.9	132.3
	1987	64.9	30.0	28.5	9.5	132.9
	1988	71.5	31.7	27.3	10.6	141.1
	1989	64.9	33.2	26.6	11.6	136.3
	1990	52.4	34.9	26.0	11.8	125.1
	1991	54.6	38.4	29.0	12.3	134.3
Post-Independence	1992	237.5	54.8	23.6	23.2	339.1
	1993	392.1	83.6	43.3	58.3	577.3
	1994	460.1	104.5	79.2	61.6	705.4
	1995	495.5	102.9	114.4	60.2	773.0
	1996	583.7	94.8	116.0	75.3	869.8
	1997	597.9	187.3	139.2	85.2	1009.6
	1998	671.7	210.4	156.4	95.7	1134.2
	1999	754.7	236.4	175.7	107.5	1274.3
	2000	847.9	265.6	197.4	120.9	1431.8
Growth Rates		4.5	7.7	8.1	4.8	5.4

Trend Equations: 1993 to 2000

$$\begin{aligned}
 \text{Log Transport \& Commu.} &= 2.560 + 0.045 t & R^2 = 0.988 & F = 505.340 \\
 &[250.29] \quad [22.47] \\
 \text{Log [Education \& Health]} &= 1.816 + 0.077 t & R^2 = 0.882 & F = 45.112 \\
 &[31.15] \quad [6.71] \\
 \text{Log [Banking \& Insurance]} &= 1.701 + 0.081 t & R^2 = 0.868 & F = 39.686 \\
 &[26.10] \quad [6.29] \\
 \text{Log [Electricity \& Water]} &= 1.685 + 0.048 t & R^2 = 0.962 & F = 115.030 \\
 &[85.49] \quad [12.45] \\
 \text{Log [Infrastructure]} &= 2.722 + 0.054 t & R^2 = 0.995 & F = 1225.337 \\
 &[343.92] \quad [35.00]
 \end{aligned}$$

Table: 25 Infrastructure Annual Growth Rates						
In percentage						
Era	Years	Transportation & Communication	Education & Health	Banking & Insurance	Electricity & Water	Total
Independence	1984	--	--	--	--	--
	1985	10.6	15.9	-2.0	50.0	11.1
	1986	18.5	11.1	18.4	23.6	17.1
	1987	-7.9	3.1	19.8	6.7	0.2
	1988	10.2	5.7	-4.2	11.6	6.2
	1989	-9.2	4.7	-2.6	9.4	-3.4
	1990	-19.0	5.1	-2.3	1.7	-8.2
	1991	4.2	10.0	15.5	4.2	7.4
	Average	1.1	7.9	6.1	15.3	4.3
	Standard Deviation	13.4	4.6	11.1	16.9	8.7
	<i>Volatility</i>	12.7	0.6	1.8	1.1	2.0
Post-Independence	1992	--	--	--	--	--
	1993	65.1	52.6	83.5	151.3	70.2
	1994	17.3	25.0	82.9	5.7	22.2
	1995	7.7	-15.3	44.4	-2.2	9.6
	1996	17.8	-7.9	1.4	25.1	12.5
	1997	2.4	97.6	20.0	13.2	16.1
	1998	12.3	12.3	12.4	12.3	12.3
	1999	12.4	12.4	12.3	12.3	12.4
	2000	12.4	12.4	12.4	12.5	12.4
	Average	18.4	23.6	33.7	28.8	21.0
	Standard Deviation	19.5	36.3	33.0	50.1	20.3
	<i>Volatility</i>	1.1	1.5	1.0	1.7	1.0

Chart: 27

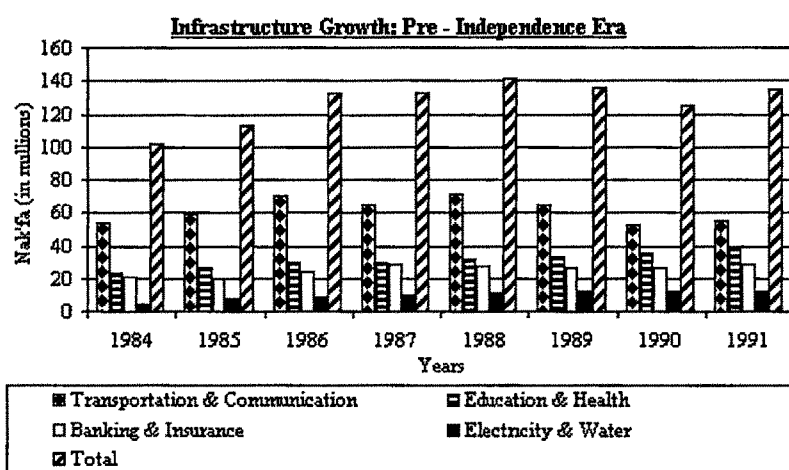


Chart: 28

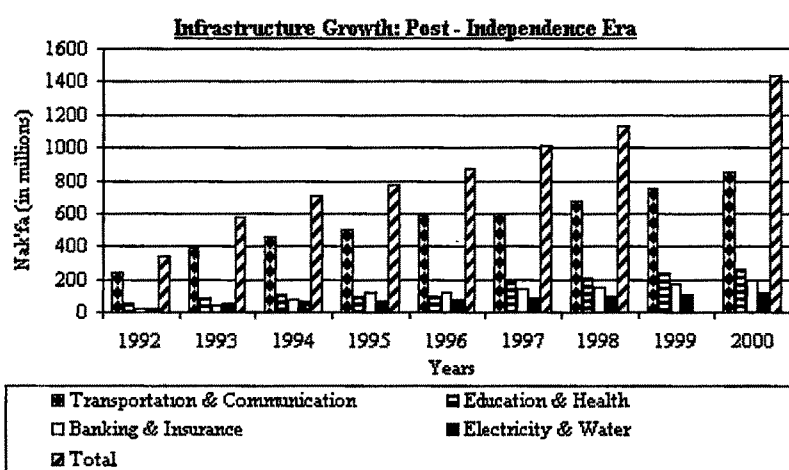
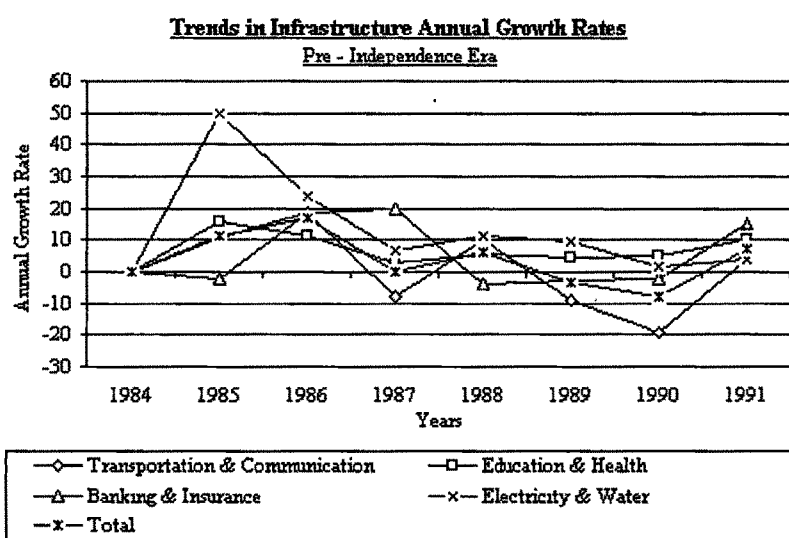
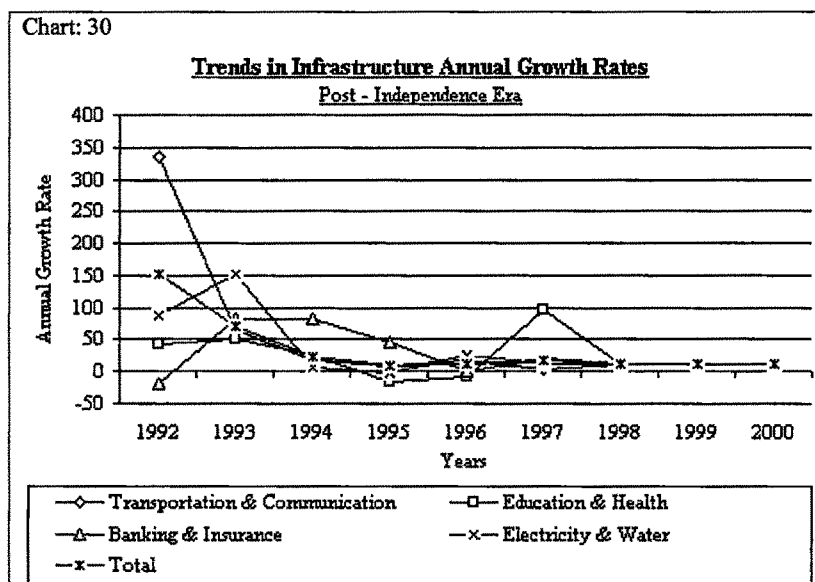


Chart: 29





b. Energy

The energy sector, though not classified separately as a sub-sector, has been included for its crucial importance.

Energy is a basic resource without which the existence of mankind is impossible. The availability of energy is the most important single factor, which acts as a constraint on economic growth of a country. Energy has been recognised as a key input for economic growth.

Energy is classified into primary and secondary energy. Primary energy is the energy recovered from nature and when it undergoes conversion it becomes secondary energy. Primary energy has little application value, whereas secondary energy can be used over a broad spectrum of applications. The term energy has been employed to designate not only chemical energy but also kinetic energy and thermal energy. There are several energy sources which play a vital role in the economic development of a nation, because energy grows food, keeps people alive; transports people and goods; fuels economic development and sustains economic systems. Thus energy covers the entire gamut of human life. Although one form of energy can substitute for another, there is no substitute for energy [Ramaswamy and Chelvam, 1997].

Recently many writers, in particular A.K.N. Reddy [India], Jose Goldeberg [Brazil] and Thomas Johansson [Sweden], have advocated conventional approach to the energy problem. The conventional approach starts with economic growth as the objective. It links growth to energy by assuming that there is a correlation between total energy use and Gross Domestic Product [taken as the measure of growth]. It asserts: if a nation wants to achieve higher level of economic growth, then it must increase the input of energy [Reddy, 1997].

As such, since energy is an essential input of all productive economic activities, the process of economic development inevitably demands increasing higher levels of energy consumption. In fact, this is the reason behind the direct correlation between the degree of economic growth and the size of per capita income and per capita consumption of energy.

In Eritrea, traditional sources of energy such as fire wood, vegetable waste and cow-dung continue to provide about 80 percent of the total energy requirements of the people, while petroleum products and electricity meet 17 percent and 3 percent of the total consumption respectively. Commercial fuel is the main source of energy for the industrial sector. It secures about 65 percent of the industrial demand for energy. Second comes electricity, which supplies over 10 percent of the industrial demand for energy.

Table: 26 Sources of Energy Consumption	
Energy Sources	Percent
Traditional Sources	80
Petroleum Products	17
Electricity	3
Total	100

The annual per capita consumption of energy in Eritrea is approximately 0.03 toe of energy. At this rate of consumption, Eritrea is among the lowest countries of the world. It is even lower compared to most African countries. Table: 27 shows a comparison between Eritrea's commercial energy consumption and the consumption in selected African countries.

Table: 27 Commercial Energy Consumption Per Capita – Per Annum	
Country	Toe
Eritrea	0.03
Tanzania	0.04
Kenya	0.14
Zimbabwe	0.52
Average for low – income countries	0.38
Average for low- income countries including China and India	0.17

3.7 Conclusions

a. Overall Economic Growth

a.1 Pre-Independence Period [1984 – 1991]

- i. The trend growth rate of nominal and real GDP in pre-independence period was very low at 1.7 and 0.2 percent respectively.
- ii. The annual growth rate in nominal GDP recorded an average growth rate of 5.9 percent per annum. While the average annual growth rate in real GDP was only 0.6 percent. On an average, the real growth rate was more erratic at the volatility rate of 9.7 than the nominal growth rate with a volatility rate of 1.9.
- iii. The annual rate of growth in the per capita income has shown continuous fall in Eritrea. Over the whole period of eight years [1984 –1991], the per capita income recorded a fall of –16.2 percent.

a.2 Post – Independence Period [1992-2000]

- i. Trend growth rate in real GDP has been quite low in post-independence Eritrea at 1.8 percent. Moreover, the real GDP growth rate has shown more volatility than the nominal GDP.
- ii. The annual growth rate of GDP has been highly fluctuating. The annual growth rate in real GDP fell down sharply from 9.7 percent in 1994 to –3.1 percent in 1995. Since then it fluctuated between 8.7 percent in 1996 to 2.6 percent in 1999, then recorded a second sharp fall in 2000, reaching the lowest level ever of –6.2 percent. Here, it is important to mention that during the year 2000, the second war offence of Ethiopia to Eritrea had reached to its peak.
- iii. Much of the fluctuations in the economic growth has been due to the effect of the political instability and direct confrontation with Ethiopia and other neighboring countries, which the Eritrean economy depends upon.

- iv. The real per capita GDP growth rate in Eritrea has been quite dismal in the post-independence era at just 0.6 percent.
- v. Today, Eritrea is considered among the poorest countries in the world. Its economic performance is the lowest among the economies of the countries in the region. Though Eritrea has the smallest population size [4.1 million], a comparison among eight countries in the neighborhood ranks it the seventh in terms of GDP per capita [PPP US \$] and the last in terms of GDP per capita growth.

b. Growth in Agricultural Sector

- i. The share of agriculture sector in the total GDP was highly affected by serious droughts and thus showed a continuous fall with high fluctuations. The share of agriculture in GDP declined from 29.9 percent in 1992 to 12.8 percent by the year 2000. On an average, the agriculture sector has contributed 18.5 percent to the total GDP.
- ii. The agricultural sector of Eritrea constitutes of four sub-sectors namely: *Crops, Livestocks, Forestry and Fishing*.
- iii. Over three fourth of agriculture production comes from crops and livestock. Forestry, which earlier used to contribute a very high share of 38 percent in total agriculture production, now contributes just a meager 1.4 percent. The average contribution of fishery in total agriculture has significantly increased in the post independence period to 20.3 percent, from just 2.5 percent in the pre-independence period. Which is about 8 times higher.
- iv. The trend growth in agricultural production has been quite low in post-independence ranging from 1.3 percent to 2.4 percent across all the agriculture sub-sectors. The volatility in the annual average growth rates in agriculture sub-sectors has been very low.
- v. The most important of all the problems of the agricultural sector in Eritrea can be specified as under:
 - Problems of agro-climate, such as poor quality of soil, scarce rainfall, humidity, poor sunshine during monsoon and very low temperature during winter in highlands etc,
 - Physiography such as wide variation in altitude and hilly terrain,
 - Inadequate infrastructure facilities like transport, irrigation, input supply, poor post-harvest technology, poor warehousing, communication and marketing networks,
 - Lack of adequate number of technically qualified personnel both at professional and para-professional levels;
 - Old cultivation methods, community ownership of land, small size of operational holding, and fragmentation of holdings.

c. Growth in Industrial Sector

- i. The share of the industrial sector in total GDP has continued to rise. It increased from 14.3 percent in 1992 to 21.4 percent in the year 2000. On an average, industrial sector contributed 18.2 percent to the total GDP. For a country such as Eritrea, in its initial stages of development, this share is rather quite promising.
- ii. The industrial sector of Eritrea consists of the following four sub-sectors: *Mining and Quarry, Manufacturing and Refinery, Small Scale Industry and Handicrafts, Construction and Building*.
- iii. Within the industrial sector, in post-independence, fastest growing sector has been construction [11.2 percent] followed by small industries [6.5 percent], manufacturing [4.1 percent] and mining [2.2 percent] in that order. The growth rates in these industrial sub-sectors have not been very volatile which is a good sign from policy planning perspective.
- iv. In order to accelerate industrialisation rapidly, the industrial sector in Eritrea would need the following necessary requirements:
 - Securing enough capital for the industrial sector from domestic and foreign sources and allocating them properly and efficiently.
 - Securing all the required power and energy, capable of carrying out production at the full production capacity.
 - Improving the domestic market and exploring regional and international markets for the Eritrean products.
 - Adoption of modern technology and techniques in transforming basic raw material and intermediate goods into manufactured goods.
 - Application of modern management techniques.
 - Decentralization of the industries with the objective of economic development and maintaining regional balanced growth.

d. Growth in Services Sector

- i. The services sector has always been dominating the Eritrean economy. The share of the service sector in total GDP has shown rising signs. It increased from 38.9 percent in 1992 to 42.4 percent in the year 2000. On an average, it contributes 41.5 percent of the total GDP, which is the highest among all the sectors. This reflects the administration priority in the post-independence era.
- ii. The services sector in Eritrea consists of four sub-sectors namely: *Distribution Services, Public Administration, Domestic Services and Others*.
- iii. Income from all the sub-sectors of the services sector in Eritrea have grown almost at the same rate of around 5 percent per annum, with very minor volatility in the annual growth rates.
- iv. Within the services sector in the post-independence period, on an average, income from distribution services contributed the most [55.1 percent], followed by public administration [30.8 percent], domestic services [9.2 percent] and others [4.8 percent] to the total services sector GDP.

e. Growth in Infrastructure

- i. Eritrea's infrastructure sector has increased from 16.9 percent in 1992 to 23.5 percent in the year 2000. On an average, infrastructure sector secured 21.7 percent of total GDP share. This is mainly due to the huge tasks of reconstruction and rehabilitation undertaken by the government to rebuild the war devastated infrastructure sector.
- ii. The income from infrastructure sector in Eritrea may be classified into four sub-sectors these are *Transportation and Communication; Health and Education; Banking, Finance and Insurance; Energy and Water*.
- iii. Infrastructure sector has witnessed quite a moderate growth rate in the post-independence period with a very negligible volatility. However, there is a lot more to achieve in this section.
- iv. Due to war and negligence, the majority of the urban centres suffer chronic shortages, if not completely lacking, the basic infrastructure and social services such as water supply, power supply, sanitation, roads, telecommunication, public transport, fire service and welfare. In general, Eritrea's population growth and economic growth will further expose the inadequacies of the present infrastructure capacity. This deficiency and inadequacy of the infrastructure capacity constitutes a major constraint to the economic growth.
- v. Poor road conditions and lack of rural road have constrained the development of rural markets and reduced linkage between regions.
- vi. Access to safe water supply and sanitation is very limited in Eritrea. There is also an extreme shortage of housing in the urban cities.
- vii. The ports of the country too are not in a better position. They have been substantially damaged specially during the liberation war.
- viii. The communication system in Eritrea is undeveloped in its all departments, and need a substantial reformation. Access to the communication services is limited to the main cities, while the rest of the country lacks even the basic communication services.
- ix. Over 80 percent of total energy demand and over 96 percent of household energy demand are met by fuel wood and biomass. This has contributed to a drastic loss in vegetative cover due to the cutting of trees for fuel. Moreover, the heavy use of animal dung for fuel in rural areas has contributed to a reduction in soil quality.
- x. Eritrea suffers from chronic electricity shortages. The impact on the commercial and industrial sectors has been very high. The lost production due to electricity shortages alone is estimated to be as high as 30 to 50 percent of the GDP.

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