# Chapter 2
# Economic Development Challenges in Sudan and the Need for Skill Upgrading and Technological Development

**Abstract** This chapter explains the general socioeconomic characteristics of Sudan and strategic problems for development in the country, and discusses the impact of oil and the opportunities and challenges for enhancing economic development in Sudan, the strategic problems facing the labour market in Sudan and highlighting the need for skill development. This chapter uses new data on population, employment and unemployment based on Sudan Central Bureau of Statistics (Fifth Sudan Population and Housing Census 2008, Sudan Central Bureau of Statistics, Khartoum, 2010) to examine four stylised facts related to the high unemployment rate; interpretate unemployment crisis from two different endogenous and exogenous perspectives due to endogenous and exogenous causes; the high incidence of unemployment among youth population and the large mismatch between educational qualifications – supply – and labour market requirements-demand in Sudan. The findings in this Chapter support the first hypothesis in Chap. 1 that Sudan needs to promote local skills and local technologies in order to facilitate implementation of the five strategies of reducing poverty; achieving economic diversification; reducing unemployment and restructuring the labour market; building local technological capacity and achieving long-term stabilised, sustainable and balanced economic growth and development.

## 2.1 Introduction

In Chap. 1 we introduced the research problem; the aim of this chapter is twofold: first, to present a background to motivate the research by explaining some stylised facts to examine more extensively the research problem along with other strategic

Nour, S. (2011, June). Assessment of the impacts of oil: Opportunities and challenges for economic development in Sudan. *The Journal of African Review of Economics and Finance, 2*(2), 122–148. African Center for Economics and Finance, Published by Print Services Unit, Rhodes University, Grahamstown, South Africa.

S. Mohamed Nour, *Technological Change and Skill Development in Sudan*,
DOI 10.1007/978-3-642-32811-4_2, 

problems confronting economic development in Sudan. Second it aims to highlight the need for upskilling and technological development in Sudan. This chapter investigates the impact of oil in enhancing economic development in Sudan. The aim is twofold: first to examine evidence related to the positive impact and opportunities offered by oil for enhancing economic development in Sudan, and then to consider the negative impacts and challenges on economic development. We provide a comprehensive analysis, improve understanding and fill the gaps in the Sudanese literature by examining our hypothesis that oil has created a mixed positive–negative impact on Sudanese economy.

In this research we use the framework of and perspectives from the new growth literature to investigate the relevance and importance of skill upgrading and technological development and the interaction between these for economic development in Sudan. Explaining the case of Sudan is significant because of the recent acceleration in growth and structural change in Sudanese economy after the exploitation of oil in the country. According to the World Bank (2008) Sudan is one of the newest significant oil producing countries in the world, and the third largest oil producer in Sub-Saharan Africa behind Nigeria and Angola. As a result of oil exploitation, the structure of Sudanese economy has shifted over time from being predominantly reliant on agriculture for growth and exports to its current reliance on the oil sector (World Bank 2008). In recent years the increasing dependence on oil has led to stable economic growth. Consequently, Sudan's real economic growth averaged around 9 % during 2005–2006, putting Sudan among the fastest growing economies in Africa (World Bank 2008). But while oil has recently contributed to the improvement of economic performance and FDI in Sudan, the recent heavy dependence on oil may lead to challenges, as oil is an exhaustible resource and because the revenue from oil is uncertain and volatile due to the instability of oil prices. Moreover, the increasing dependence on oil raises questions such as the incidence of the Dutch Disease phenomenon.[1]

Moreover, both the growing inflow of FDI and the increased wealth from oil has encouraged migration to Sudan. Consequently, migrant workers have increased in the labour market, particularly in the private sector, which leads to several problematic features such as low skill levels and contribution to the growing unemployment rate. In addition, Sudan suffers from structural problems related to the lack of political stability, continuous conflict, regional disparities due to imbalanced development strategies, poverty, high unemployment rate, and lack of incentives, which has also affected the structure of labour market. Moreover, skill and technology indicators in Sudan show poor performance and a substantial gap when compared to international standards. Hence, upskilling and technological development become imperative to overcome the strategic problems and challenges confronting economic development in Sudan.

[1] "The Dutch Disease is a process in which the discovery of natural resources causes a country to experience a 'change in the group of reference' from one that aim at generating a trade surplus in manufacturing to one that able to generate a trade surplus in primary commodities. The country experiencing this disease also shows differences between employment in manufacturing. The process of de-industrialisation due to the discovery of natural resources, mainly natural gas apparent from the case of Holland". Cf. Palma (2003), p. 21.

The rest of this chapter is organised in the following way: Sect. 2.2 explains the general socio-economic characteristics of Sudan; Sect. 2.3 examines the stylised facts on the positive and negative impact of oil in enhancing economic development in Sudan; Sect. 2.4 discusses the strategic problems facing the labour market in Sudan and highlights the need for skill upgrading and technological development; Sect. 2.5 concludes.

## 2.2 Economic Characteristics and Strategic Problems for Development in Sudan

Technological change and skill development are often closely related not only to the resources directly devoted to their development but also to the whole economic structure that supports them. Therefore, before assessing the need for technological development and skill development in Sudan it is useful to start by explaining the general political context and socio-economic characteristics of the country. Since the structure of Sudanese economy is now related to oil, it will be useful to examine the impact of oil in the following section. Next, we show the structural problems related to the labour market, skill, technology and productivity, and we attempt to link these to the general socio-economic characteristics of Sudan.

### *2.2.1 General Political Context and Socio-Economic Characteristics of Sudan*

Before assessing the impact of oil in enhancing economic development, it is useful to start by explaining the general socio-economic characteristics of Sudan. Next, we examine the link between the general socio-economic characteristics and the impact of oil in Sudanese economy.

The political context in Sudan is characterised by a long history of political instability, continuing civil wars and complex conflict between the north and the south.[2] Even after the independence of Southern Sudan, Sudan still endures political

[2] As for the political context since independence in 1956 and over the past five decades, Sudan was ruled by three civilian governments (1956–1958, 1964–1969 and 1985–1989) and three military governments (1958–1964, 1969–1985; 1989–2010). Sudan suffered from political instability, as the three short-lived civilian governments were often removed and overthrown by the military governments. For instance, the first civilian government after independence (1956–1958) was overthrown in 1958 by the Abbud Military Government (1958–1964); the second elected civilian government (1964–1969) was overthrown in 1969 by the Nimeiri Military Government (1969–1985); and once again the third elected civilian government (1985–1989) was overthrown in 1989 by the Al Bashir Military Government (1989–2005). Since the signing and implementation of the Comprehensive Peace Agreement (CPA) in January 2005, Sudan has been ruled by the Government of National Unity (GNU), which represents a power-sharing government between the National Congress Party (NCP) of the north and Sudan People's Liberation Movement (SPLM) of the south. The implementation of the CPA implies several important agreed issues, which included

instability, a lack of sound and systematic institutions and a lack of a commitment to implementing long-term sustainable and balanced economic development plans and strategies.[3] This implies that the interaction between these political, economic and institutional factors together have unfortunately continued to contribute to a low standard of economic development in Sudan, as we explain below in the next sections.

The general socio-economic characteristics of Sudan indicate great diversity between Sudan compared to other African, Arab and world countries in terms of population, standard of economic development defined by Gross National Income (GNI) and GDP per capita and human development index. Table 2.1 below explains that on average Sudan has a higher population coupled with a lower standard of economic development. The World Bank classification of economies puts Sudan among the lower-middle income bracket and the United Nations Development Programme (UNDP) puts Sudan among the low human development, and poor and highly indebted economies. Moreover, the United Nations Development Programme-Human Development Index (UNDP-HDI) shows that the average life expectancy, literacy rate and combined enrolment ratios of Sudan are lower than those of other Arab and world countries. Furthermore, Sudan has continued to suffer from macro-economic instability, high rates of poverty, unemployment and debt. Despite the high and increasing inflow of FDI to Sudan (increased from −0.2 % of GDP in 1990 to 8.4 % of GDP in 2005), the country suffered from the high increase in debt services both as percentage of GDP (0.4 %–1.4 %) and as percentage of exports (8.7–6.5 %) over the period 1990–2005. That was probably because like most African countries, Sudan's economy has relied heavily on a large influx of foreign aid from different sources; Sudan is among the top ten recipients of gross Official Development Assistance during 1990–2007 (see UNDP 2007).

---

the formation of the Government of National Unity (GNU) in 2005, which represents a power-sharing government between the National Congress Party (NCP) of the north and Sudan People's Liberation Movement (SPLM) of the south. Moreover, the implementation of the CPA implies several other important agreed issues, which included the establishment of an interim transitional period of autonomous rule for the South for 6 years (2005–2011), followed by self-determination for Southern Sudan and a referendum that was held in January 2011, in which Southern Sudan decided on secession from the north. In July 2011 Southern Sudan officially gained its independence from Sudan. As for government and politics, the politics of Sudan takes place in the framework of a federal presidential representative democratic republic; the judiciary is independent and obtained by the Constitutional Court and the legislative power is vested in both the government and in the two chambers, the National Assembly (lower) and the Council of States (upper). The bicameral National Legislature is the official Sudanese parliament and consists of 500 appointed members. Before the secession of Southern Sudan, Sudan was divided into 26 states, which in turn were subdivided into 87 districts; the ten states in Southern Sudan were subdivided into 84 counties. The states are: Al Gezira, Al Qadarif, Blue Nile, Central Equatoria, East Equatoria, Jonglei, Kassala, Khartoum, Lakes, North Bahr al Ghazal, North Darfur, North Kurdufan, Northern, Red Sea, River Nile, Sennar, South Darfur, South Kurdufan, Unity, Upper Nile, Warab, West Bahr al Ghazal, West Darfur, West Equatoria and White Nile.

[3] In Sudan the available natural resources include agricultural, water and rivers, in addition mineral resources include petroleum and crude oil, natural gas, gold, silver, asbestos, manganese, gypsum, mica, zinc, iron, lead, uranium, copper, kaolin, cobalt, granite, nickel, tin, chrome, and aluminum.

**Table 2.1** General socio-economic characteristics of the Sudan[1]

| Country | Population[a,b] (millions) (2010) | Gross national income (GNI) per capita (PPP[c] US$) | Human development index[a] (%) | Life expectancy [a] (years) | Mean years of schooling | Expected years of schooling | Adult literacy rate [a] (% aged 15 and above) | Population with at least secondary education (% ages 25 and older) | Tertiary enrolment ratio (% of tertiary school-age population) gross (%) |
|---|---|---|---|---|---|---|---|---|---|
| | 2010 (a) | 2010 (b) | 2010 (c) | 2010 (a) | 2010 (d) | 2010 (e) | 2005–2008a (e) | 2010 (d) | 2001–2009a (e) |
| Sudan[b] | 43.2 | 2,051 | 0.379 | 58.9 | 2.9 | 4.4 | 69.3 | 11.5 | 5.9 b |
| Latin America and the Caribbean | 582.7 | 10,642 | 0.704 | 74.0 | 7.9 | 13.7 | 91.1 | 32.5 | 36.7 |
| Arab States | 348.2 | 7,861 | 0.588 | 69.1 | 5.7 | 10.8 | 72.1 | | 22.7 |
| Europe and Central Asia | 410.3 | 11,462 | 0.702 | 69.5 | 9.2 | 13.6 | 97.5 | 65.1 | 54.2 |
| East Asia and the Pacific | 1,974.3 | 6,403 | 0.643 | 72.6 | 7.2 | 11.5 | | | 20.9 |
| South Asia | 1,719.1 | 3,417 | 0.516 | 65.1 | 4.6 | 10.0 | 62.4 | 21.6 | 12.8 |
| Sub-Saharan Africa | 808.8 | 2,050 | 0.389 | 52.7 | 4.5 | 9.0 | 62.4 | | 5.5 |
| OECD | 1,026.3 | 37,077 | 0.879 | 80.3 | 11.4 | 15.9 | | 73.8 | 71.4 |
| High human development | 1,052.4 | 12,286 | 0.717 | 72.6 | 8.3 | 13.8 | 92.3 | 41.0 | 43.2 |
| Medium human development | 3,597.3 | 5,134 | 0.592 | 69.3 | 6.3 | 11.0 | 80.7 | | 17.6 |
| Low human development | 1,099.0 | 1,490 | 0.393 | 56.0 | 4.1 | 8.2 | 61.2 | 14.3 | 6.0 |
| Least developed countries | 854.7 | 1,393 | 0.386 | 57.7 | 3.7 | 8.0 | 59.9 | | 5.4 |
| World | 6,908.7 | 10,631 | 0.624 | 69.3 | 7.4 | 12.3 | | | 25.7 |

[1]The World Bank and United Nations Development Programme (UNDP) Human Development Report classify world countries differently according to income level. We use the World Bank classification of economies that puts Sudan in the lower middle-income category or group

Source: (a) UNDP (2010a). Notes: [a]2007, [b]2008, [c]*PPP* purchasing power parity: pp. 145–146, 186–187, 195–196

(a) UNDESA (2009d), (b) Based on data on GNI per capita and GDP per capita in PPP US dollars (current and constant prices) from World Bank (2010g) and implied growth rates of GDP per capita from IMF (2010a), (c) Calculated based on data from UNDESA (2009d), Barro and Lee (2010), UNESCO Institute for Statistics (2010a), World Bank (2010g) and IMF (2010a), (d) Barro and Lee (2010), (e) UNESCO Institute for Statistics (2010a)

The structure of Sudanese economy has long been characterised by a small share of industry, notably manufacturing, and a high share of agriculture and service sectors in GDP and employment. The share of agriculture in GDP increased from 30.3 % in 1990 to 49.8 % in 1999 and then declined to 31.1 % in 2009; the share of the services in GDP declined from 54.4 % in 1990 to 34.4 % in 1999 and then increased to 45.0 % in 2009; the share of industry in GDP increased from 15.4 % in 1990 to 15.8 % in 1999 and then increased to 23.9 % in 2009 (see Table 2.2 below). In 1999 Sudan began exporting oil and since then has become increasingly dependent on oil exports to the extent that the economy has turned into an oil dependent economy.[4] Since the late 1990s the implementation of macro-economic reforms policies, along with the positive contribution of oil to Sudan economy since 1999, has caused a rapid increase in real economic growth, GDP and GDP per capita incomes (see Table 2.2 and Fig. 2.1 below). Consequently, Sudan has moved from a low income economy into a lower medium income economy according to World Bank classifications. But while the increasing dependence on oil has had some positive effects, it has also sparked a number of negative impacts and raises questions such as the incidence of the Dutch Disease phenomenon as we explain in the next sections.

## 2.3 Overview on the Importance and Impact of Oil in Sudan

Based on the above background on the socio-economic characteristics of Sudanese economy and since its structure is now closely linked to oil, in this section it is useful to examine our hypothesis on the mixed positive–negative impact of oil on Sudanese economy. Before explaining the positive and negative impact of oil on Sudanese economy, it is useful to start with a historical background about the structure of investment in oil and show the role of China in investment in the oil sector in Sudan.

### *2.3.1 Overview on the Importance and Historical Background About Oil in Sudan*

According to the World Bank (2008) Sudan is one of the newest significant oil producing countries in the world, and the third largest oil producer in Sub-Saharan Africa behind Nigeria and Angola (see Fig. 2.2). The major oil production fields are located in Southern Sudan but the major oil refineries, ports and pipelines are located in Sudan. Due to this conflict, oil exploration has mostly been limited to the central and south-central regions of Sudan. The institutional structure of the oil sector in

[4] Sudan oil output is estimated at 500,000 barrels per day (2007) and oil reserves at five billion barrels (2005). See WB-DTIS (2008), p. 2. Moreover in 2005, the Sudanese Energy Ministry estimated total oil reserves at five billion barrels.

**Table 2.2** The performance, structure and structural change in Sudan economy (1990–2009). Basic indicators of labour force, unemployment and inflation rates in Sudan over the period (1990–2008)

| | GDP | | | | | | | | Balance of trade | | | Structure of Sudan economy (share of sectors in GDP) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Total | Growth rate | Per capita | Per capita growth rate | Inflation rate | Unemployment rate | Exchange rate | Balance of payment | Exports | Imports | Balance | Agriculture | Industry | Services |
| 1990 | 244.7 | 5.4 | 47.7 | 0 | 41 | 14.2 | 0.45 | −76.1 | 374 | 618.4 | −244.4 | 30.3 | 15.4 | 54.4 |
| 1991 | 276.8 | 7.5 | 81 | 69.8 | 62.7 | | 0.69 | −101.3 | 308.7 | 890.3 | −581.6 | 28.7 | 17.6 | 53.9 |
| 1992 | 4,327.8 | 6.5 | 17.2 | −78.7 | 105.4 | | 9.7 | −58.1 | 319.3 | 820.9 | −501.6 | 33.7 | 17.1 | 49.1 |
| 1993 | 5,862.1 | 4.5 | 37.6 | 118.4 | 115 | 10.3 | 16.1 | 37.7 | 417.3 | 944.9 | −527.6 | 37.9 | 17.4 | 44.5 |
| 1994 | 6,351.2 | 1 | 72.5 | 92.7 | 96.3 | | 29.6 | 17.9 | 535.6 | 1,059.6 | −524 | 40.1 | 16.4 | 43.5 |
| 1995 | 9,880.7 | 5.9 | 151.7 | 109.4 | 177.2 | | 55.9 | −58.1 | 555.7 | 1,184.8 | −629.1 | 43.1 | 15.8 | 41.1 |
| 1996 | 8,259.3 | 5.9 | 375.9 | 147.7 | 76.3 | 14.3 | 125 | −63.9 | 620.3 | 1,504.5 | −884.2 | 44.9 | 14.5 | 40.6 |
| 1997 | 10,684.8 | 6.3 | 563.7 | 50 | 52.6 | 18.1 | 156.9 | −36.2 | 594.2 | 1,421.9 | −827.7 | 47.6 | 15.1 | 37.2 |
| 1998 | 11,513.7 | 6.4 | 743.7 | 31.9 | 28.2 | 15.1 | 198.8 | 25.1 | 595.7 | 1,732.2 | −1136.5 | 48.6 | 15 | 36.2 |
| 1999 | 10,325 | 6.7 | 892.3 | 20 | 6.4 | 15.7 | 252 | 111.5 | 780.1 | 1,256.2 | −476.1 | 49.8 | 15.8 | 34.4 |
| 2000 | 11,242.2 | 8 | 1,083.1 | 21.4 | 8.5 | 15.2 | 257.2 | 81.5 | 1,807 | 1,553 | 254 | 46.4 | 21.4 | 32.2 |
| 2001 | 12,596.5 | 6.7 | 1,274.0 | 17.6 | 4.8 | 15.0 | 257.3 | −90.04 | 1,547 | 1,457 | 90 | 45.6 | 22.8 | 31.6 |
| 2002 | 3,924 | 6.5 | 1,457.4 | 14.4 | 8.3 | 15.8 | 236 | 198.72 | 1,949 | 2,179.22 | −230.11 | 46 | 23.2 | 30.9 |
| 2003 | 4,549 | 6 | 1,656.4 | 13.7 | 7.7 | 16.3 | 261 | 422.6 | 2,542.2 | 2,536.1 | 6.07 | 44 | 24.1 | 30.3 |
| 2004 | 5,278 | 7.2 | 1,991.2 | 20.2 | 8.5 | 16.3 | 258 | 730.2 | 3,777.75 | 3,586.18 | 191.57 | 40 | 28.0 | 32.0 |
| 2005 | 6,283 | 8 | 2,421.2 | 21.6 | 8.5 | 16.2 | 245.6 | 530.5 | 4,824.3 | 5,946.0 | −1121.7 | 39.0 | 28.0 | 32.0 |
| 2006 | 22,217. | 10.0 | 2,719.0 | 12.3 | 7.2 | 17.3 | 2.0248 | −208.6 | 5,656.6 | 7,104.0 | −1,448.1 | 36.8 | 27.5 | 35.7 |
| 2007 | 22,21 | 10.5 | 3,059.2 | 12.5 | 8.1 | 19.4 | 2.0308 | −282 | 8,879.2 | 7,722.4 | 1,156.8 | 35.3 | 30.6 | 34.1 |
| 2008 | 26.03 | 7.8 | 3,262.6 | 6.6 | 14.3 | 20.7 | 2,09 | 21.1 | 11,670.5 | 8,229.4 | 3,441.1 | 29.3 | 29.2 | 41.5 |
| 2009 | 27.63 | 6.1 | | | 11.2 | | 2,32 | −502.2 | 7,833.7 | 8,528.0 | −694.3 | 31.1 | 23.9 | 45.0 |

Sources: (1) Sudan Ministry of Finance and National Economy (1997–2007), (2) The Central Bank of Sudan Annual Report (Various Issues: 1999–2009) (3) Sudan Central Bureau of Statistics: Sudan Ministry of the Cabinet – Central Bureau of Statistics: Sudan statistical year book: Sudan statistics 1990–2008: pp. 39–43. (4) Sudan Ministry of Labour and Administration Reform – Department of Planning and Monitoring and Follow-Up. (5) Central Bureau of Statistics – Migration and Labour Force Survey 1996. (6) Central Bureau of Statistics – Department of Internal Commerce and Pricing. (7) Own calculation based on Sudan Central Bureau of Statistics Population Census Data (2010): The Fifth Sudan Population and Housing Census (2008)
Figures for 1998 from Ministry of Finance and National Economy – Annual Economic Survey 2000, Table 7-2, p. 10.

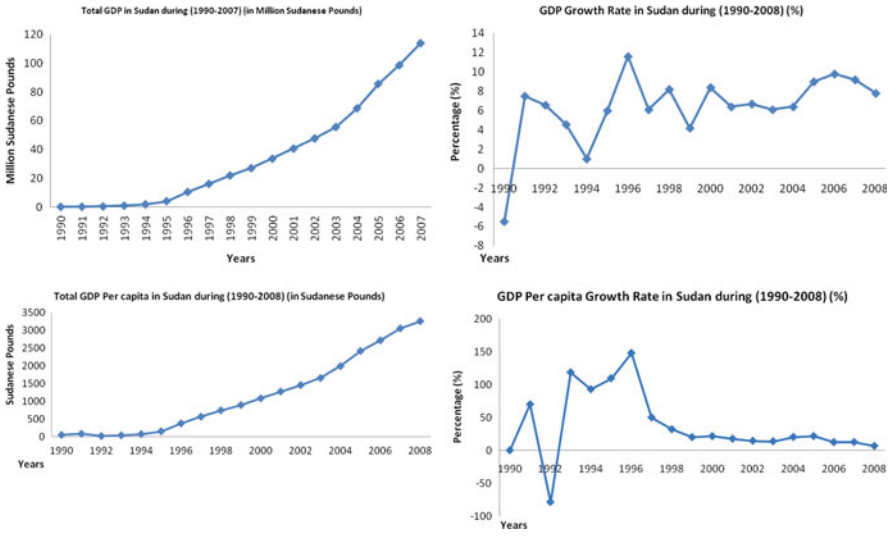


**Fig. 2.1** Total and growth rates of GDP and GDP per capita in Sudan during (1990–2008) (Millions Sudanese pounds) and (%) (Source: Adapted from Sudan Central Bureau of Statistics: Sudan Ministry of the Cabinet – Central Bureau of Statistics: Sudan statistical year book: Sudan statistics 1990–2008: pp. 39–43)

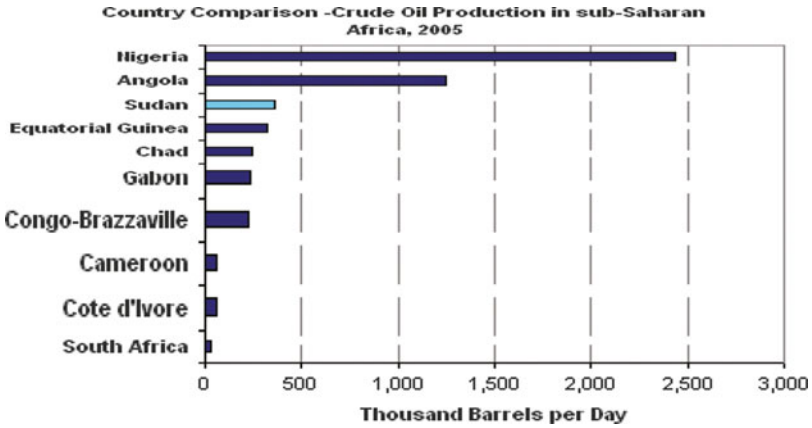


**Fig. 2.2** Country comparison crude oil production in sub-Saharan Africa 2005 (Source: International Energy Information Agency, *Sudan Analysis,* www.eia.doe.gov/cabs/Sudan/Oil.html) (See Oil fact sheet on Sudan, September 2006, p. 1, International Energy Agency Estimates; International Energy Annual, IPM)

Sudan indicates that the oil industry is regulated by the Ministry of Energy and Mining, yet the Ministry of Finance and National Economy and National Petroleum Commission are also involved. Sudanese oil sector includes several foreign international oil companies with a long history of investing in oil exploration and production

in Sudan. More recently, the sector reflects increasing involvement of national and foreign companies.[5] Foreign oil producing companies involved in Sudan's oil sector are primarily from Asia organised under the consortium of the Greater Nile Petroleum Operating Companies (GNPC), led by the China National Petroleum Corporation (CNPC), which owns the largest single share in the GNPC consortium (40 %); followed by Malaysia's Petronas (30 %); India's Oil and Natural Gas Corporation (25 %), and Sudanese Government's Sudapet company (5 %).[6]

### 2.3.2 *The Role of China in the Exploration, Production and Export of Sudanese Oil*

As the major player in Sudanese oil industry, China uses a combination of investment, trade, aid flows and diplomacy to maintain access to oil resources in Sudan.

For the period 2000–2007, we find that China contributed more than one third of total foreign investment across all sectors (38.67 %), and almost half of total foreign investment in the petroleum sector (47.63 %). By contrast, China's FDI contribution is marginal in the industrial (0.56 %), services (0.08 %) and agricultural (0.02 %) sectors. Therefore, Chinese investments are largely concentrated in the petroleum sector (99.90 %), as compared to industrial (0.07 %), services (0.03 %) and agricultural (0.0001 %) sectors.[7] The importance of Chinese investment in the oil sector in Sudan compared to that of other Asian countries over the period 1999–2008 is demonstrated by China's large share in oil concessions (6–95 %), total oil investment (47.3 %), upstream oil investment (43.8 %), downstream oil investment (56.9 %), oil pipe lines (47.6 %), oil refinery (50 %), petrochemicals (95 %), oil refinery and petrochemicals (51 %) and oil marketing, industry and manufacturing (12.5 %) (see Table 2.3 below).[8] Moreover, the significant Chinese

[5] Sudan National Petroleum Corporation (Sudapet) develops joint ventures with foreign companies in downstream projects. However, due to its limited technical and financial resources, the company takes a minor role in large upstream development projects.

[6] India's Oil and Natural Gas Corporation has acquired Talisman's Energy (Canada) interest for 25 %. See 'Oil Fact Sheet on Sudan' (September 2006), produced by C. Pinaud for UnderstandingSudan.org, pp. 1–2; Salih (2004), pp. 21–40.

[7] See Sudan Ministry of Investment unpublished statistics and data from the feasibility studies (2009).

[8] According to the Ministry of Energy and Mining (2008), among the Asian countries China contributes by significant share in investment and concessions in the oil sector that includes many Chinese companies involved in many blocks over the period (1999–2008). For example, we observe a significant share of the Chinese companies, namely, (China National Petroleum Company (CNPC) (40 %) of total concession of the Greater Nile Petroleum Operating Company (GNPOC); CNPC (41 %) of total concession of Petrodar Petroleum Operating Company; Sinopec (6 %) of total concession of Petrodar Petroleum Operating Company; CNPC (95 %) of total concession of China National Petroleum Company International Sudan (GNPCIS); Petroenergy (40 %) of total concession of Group of Companies and Petroenergy (35 %) of total concession of

**Table 2.3** The share of China in total Asian countries concession and investment, in oil sector in Sudan (1999–2008) (%)

| Items | China oil company | Share of China in total (%) |
|---|---|---|
| (1) Oil concession | | |
| Greater Nile Petroleum Operating Company (GNPOC) | China National Petroleum Company (CNPC) | 40 |
| Petrodar Petroleum Operating Company (PDOC) | CNPC | 41 |
| Petrodar Petroleum Operating Company (PDOC) | SINOPEC | 6 |
| China National Petroleum Company International Sudan (GNPCIS) | CNPC | 95 |
| Group of Companies | PETROENERGY | 40 |
| Red Sea Oil Company | PETROENERGY | 35 |
| (2) Oil investment in | | |
| (a) Up-stream oil investment | CNPC and SINOPEC | 43.8 |
| (b) Down-stream oil investment | CNPC and SINOPEC | 56.9 |
| Average total up-stream and down-stream oil investment | CNPC and SINOPEC | 47.3 |
| (c) Investment in oil pipe lines | CNPC and SINOPEC | 47.6 |
| (d) Investment in oil refinery | (CNPC) | 50 |
| (e) Investment in petrochemicals | (CNPC) | 95 |
| (f) Investment in oil refinery and petrochemicals | (CNPC) | 51 |
| (g) Investment in marketing, industry and manufacturing of oil | KANDOC PETROCHEMICAL | 12.5 |

Source: Sudan Ministry of Energy and Mining 2008

investment in the oil sector in Sudan has spurred the trade relationship between Sudan and China, which in turn has benefited both the Chinese and Sudanese economies as demonstrated by the large volume of exports (US$ 39.241 million) and imports (US$ 11.576 million) between Sudan and China over the period 1997–2010, and the large average share of China in total Sudanese exports (69.56 %) and imports (15.67 %) over the period 2000–2010.[9] According to data

Red Sea Oil Company. Moreover, the Sudan Ministry of Energy and Mining 'Unpublished Report' (2008), indicates that out of the Asian countries' total investment (84.4 %) in Sudan, the share of China (Chinese CNPC + SINOPEC companies) is largest in total oil investment (47.3 %), upstream oil investment (43.8 %) and downstream oil investment (56.9 %). In addition to the large share of China (47.6 %: CNPC (45.2 %) and SINOPEC (2.4 %)) in total Asian countries' investment in Sudanese oil pipe lines during 1999–2008, China has a large share (CNPC: 50 %) and partnership with the Sudanese government in investment in oil refinery and in petrochemicals (CNPC: 95 %), refinery and petrochemicals (CNPC: 51 %) and in marketing, industry and manufacturing of oil (Kandoc petrochemical: 12.5 %) of the total of Asian countries' investment in the oil sector in Sudan over the period 1999–2008.

[9] See Sudan Ministry of Finance and National Economy 'Unpublished Report' (2008); Central Bank of Sudan '44th Annual Report' (2004), Appendix No. XVI, pp. 188–189; and '48th Annual Report' (2008), Appendix No. XVI-B-XVIIB, pp. 158–164.

from the Central Bank of Sudan for the period 2000–2010, China's share in Sudanese total exports to all foreign countries ranged from 44 % to over 80 %; its share in Sudanese total imports from all foreign countries ranged from 6 % to over 30 %; and its share in Sudanese petroleum exports to all foreign countries ranged from 58.87 % to over 87.7 % (see Table 2.4 below). Over the period 1999–2010, petroleum dominated Sudan's exports to China (99.4 %), while non-oil exports to China represented only a small share (0.6 %). China is therefore the largest importer of Sudan's petroleum (80.07 %), leaving Sudan's petroleum exports to other countries at only (19.93 %). Furthermore, the significant investment of China in the oil sector in Sudan motivated China to increase its aid and development assistance, loans and grants to Sudan. For instance, of the total loans and grants transmitted to Sudan over the period 1999–2009, compared to other countries, the share from China is significant and ranges from 7 % to 76 % during those years. The average shares increased from 33 % to 45 % and 58 % during the periods 2002–2007, 2004–2007 and 2005–2007 respectively (see Table 2.4 below).[10]

### *2.3.3 Overview on the Oil Impact, Opportunities and Challenges for Development in Sudan*

Based on the above background, since the structure of Sudan's economy is now related to oil, this section examines the impact of oil on Sudanese economy, by explaining first the positive impact of oil and opportunities for development and then explaining the negative impact of oil and challenges of development in Sudan (see Table 2.5 below).

#### 2.3.3.1 Oil and the Opportunities for Development in Sudan

This section explains how oil created various positive effects and opportunities for development in Sudan. These include the effect of oil in satisfying domestic demand and achievement of self-sufficiency, increasing government resources, revenues and spending, economic growth (GDP growth and composition), foreign trade (volume and structure of exports), balance of trade, balance of payment, FDI and social development in Sudan.

[10] Nour (2011) indicates that Chinese aid to Sudan is tied/related to trade, FDI and importance of oil to Chinese economy and that the increase in the inflow of Chinese aid and development assistance in the form of loans has caused mixed positive and negative impacts for Sudanese economy over the period 1997–2007, by providing alternative complementary sources of finance to complement the shortage of domestic capital and financing development projects, but by increasing Sudan's debts to China from 0.9 % in 1999 to 13.45 % in 2007. Despite the global economic crisis China has reaffirmed its commitment to maintain further aid and development assistance to Sudan, to maintain the economic interests of its access to oil in the country.

**Table 2.4** The trend and share of China in petroleum and total exports from Sudan and in total loans and grants to Sudan (1999–2010) (%)

| Share of China in total (%) | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010[a] | (2000–2010)[b] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Petroleum export (%) | | 58.87 | 72.78 | 85.03 | 84.99 | 80.64 | 80.86 | 82.30 | 86.16 | 78.85 | 82.63 | 87.7 | 80.07 |
| Total export (%) | 0.07 | 44.12 | 59 | 65.74 | 69.31 | 66.89 | 71.04 | 74.87 | 81.95 | 75.02 | 75.77 | 81.42 | 69.56 |
| Total loans and grants (%) | 17 | | | 7 | 8 | 7 | 76 | 24 | 73 | 3.35 | 27.44 | | |
| Average total loans and grants (%) (1999–2007) (2007–2009)[c] | 24 | 24 | 28 | 33 | 38 | 45 | 58 | 49 | 73 | 38 | 35 | | |

Sources: (1) Adapted from Sudan Ministry of Foreign Trade and Central Bank of Sudan Annual Foreign Trade Statistical Digest various issues (1999–2010): 2006: p. 20, p. 38. 2005: p. 38, p.20. 2004: p. 20, p. 39. 2002: p. 9, p. 24. 2000: p. 9, p. 24. (2) Adapted from the Central Bank of Sudan Annual Reports (1999–2007), Ministry of International Cooperation and Ministry of Finance and National Economy

[a]January 2010–March 2010.

[b]Average (2000–2010).

[c]For calculation of the average share of China in total loans and grants (1999–2007) and (2007–2009) we use the year 2007 as a reference year because it witnessed the largest inflow of China aid and development assistance to Sudan over the period (1999–2009).

**Table 2.5** The impact of oil in Sudan economy and macroeconomic indicators in Sudan (1999–2010)

| | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Revenue (% of GDP) | 8 % | 11.5 % | 10.7 % | 11.9 % | 16.0 % | 19.7 % | 21.7 % | 20.0 % | 19.9 % | 19.3 % | 13.5 % |
| Expenditure (% of GDP) | 8.9 % | 12.2 % | 11.6 % | 12.8 % | 15.3 % | 18.2 % | 23.4 % | 24.3 % | 23.0 % | 17.8 % | 16.3 % |
| Fiscal deficit (% of GDP) | −0.9 % | −0.7 % | −0.9 % | −0.8 % | 1 % | 1.5 % | −1.8 % | −4.3 % | −3.1 % | 1.6 % | −2.8 % |
| Oil exports (% of GDP) | 1 % | 9.5 % | 10 % | 10 % | 12 % | 14 % | 15 % | 14 % | 18 % | 7.3 % | 7.2 % |
| Total oil export | 689 % | 1,350,757 | 1,376,666 | 1,510,857 | 2,047,705 | 3,100.5 | 4,187.4 | 5,087.2 | 8,418.5 | 11,094.1 | 7,131.20 |
| Total non oil export | 1,164 | 455.9 | 322 | 438.3 | 4,949.5 | 677.3 | 636.9 | 569.4 | 460.7 | 576.4 | 702.5 |
| Total exports | 1,853 | 1,806.7 | 1,698.7 | 1,949.1 | 2,542.2 | 3,777.8 | 4,824.3 | 5,656.6 | 8,879.2 | 11,670.5 | 7,833.70 |
| Total imports | 1,256.2 | 1,553 | 1,457 | 2,179.22 | 2,536.1 | 3,586.18 | 5,946.0 | 7,104.0 | 7,722.4 | 8,229.4 | 8,528.0 |
| Trade deficit | −476.1 | 254 | 90 | −230.11 | 6.07 | 191.57 | −1121.7 | −1,448.1 | 1,156.8 | 3,441.1 | −694.3 |
| Balance of payment deficit | 111.5 | 81.5 | −90.04 | 198.72 | 422.6 | 730.2 | 530.5 | −208.6 | −282 | 21.1 | −502.2 |
| Share of oil exports (%) | 37 % | 74.8 % | 81 % | 77.5 % | 80.6 % | 82.1 % | 87 % | | | 95.1 % | 91.0 % |
| Share of non oil export (%) | 63 % | 25.2 % | 19 % | 22.5 % | 19.4 % | 17.9 % | 13 % | | | 4.9 % | 9.0 % |
| Total revenue | 109,015 | 334.0 | 366.3 | 474.9 | 715.0 | 1,029.0 | 1,218.4 | 15,075 | 18,462.4 | 24,707.9 | 20,045.6 |
| Total oil revenues | 15.7 | 143.8 | 149.7 | 200.6 | 399.0 | 502.9 | 608.6 | 7557 | 10,047.6 | 15,996.7 | 9,596.2 |
| Total non oil revenues | 108,999.3 | 190.2 | 216.6 | 274.3 | 316.0 | 526.1 | 609.8 | 7,518 | 8,414.8 | 8,711.20 | 10,449.4 |
| Share of oil in total revenues (%) | 0.01 % | 43 % | 41 % | 42.3 % | 40 % | 49 % | 50 % | 50 % | 54.4 % | 64.7 % | 47.9 % |
| Share of non-oil in total revenues (%) | 99.09 | 57 % | 59 % | 57.7 % | 60 % | 51 % | 50 % | 50 % | 45.6 % | 35.3 % | 52.1 % |
| Share of oil in GDP (%) | 1 % | 6.8 % | 7.9 % | 9.1 % | 9.6 % | 14.6 % | 15.1 % | 15.1 % | 20.1 % | 18.2 % | |
| Share of oil revenues in GDP (%) | | 4.6 % | 4.3 % | 5.1 % | 8.8 % | 9.5 % | 9.9 % | | | | |
| Share of current spending in total spending (%) | | 85 % | 81.8 % | 73 % | 74.9 % | 71.9 % | 78.5 % | 80.61 % | 82.99 % | 87.45 % | 85.29 % |
| Share of development spending in total spending (%) | | 15 % | 18.2 % | 27 % | 25.1 % | 28.1 % | 21.5 % | 19.39 % | 17.01 % | 12.55 % | 14.71 % |
| Share of current spending in GDP (%) | | 9.70 % | 9.90 % | 10.60 % | 12.00 % | 15.10 % | 18.10 % | | | | |
| Share of development spending in GDP (%) | | 1.7 % | 2.2 % | 2.6 % | 4 % | 5.8 % | 4.5 % | 6.4 % | 7.2 % | 7.4 % | |
| Share of total spending in GDP (%) | | 11.4 % | 12.1 % | 13.2 % | 16 % | 20.9 % | 22.6 % | | | | |
| Net FDI | | 392 | 574 | 713.2 | 1,349.2 | 1,511.1 | 2,304 | 35,341 | 24,256 | | |

Source: Adapted from the Central Bank of Sudan and Ministry of Finance and National Economy Annual Reports (various issues)

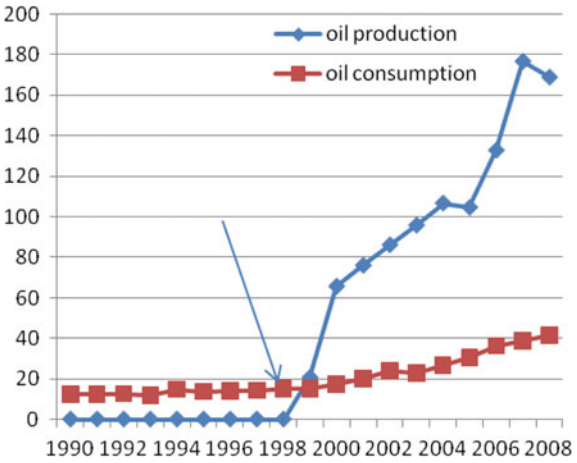


**Fig. 2.3** Sudan's oil production and consumption 1990–2008 (Source: Adapted from Sudan Ministry of Energy and Mining Statistics)

Beginning with the impact of oil production, we find that the local production of oil created important positive effects and opportunities by enabling Sudan to gain self-sufficiency in oil to satisfy domestic demand. Moreover, the local production of oil enables the government to stop the high costs previously required for the importation of oil to satisfy local demand and to mobilise the accumulated saving from the surplus amount of capital to be allocated for funding other domestic needs.[11] Furthermore, the local production and exportation of oil implies that Sudan shifted from an oil importing economy into an oil exporting economy (see Fig. 2.3 above). For instance, in 2001 more than half of Sudanese crude oil was exported (51 %) while the rest was used to satisfy local consumption (49 %).[12]

Moreover, the positive impact of oil on government financial resources is observed from the increasing share of Sudanese government in oil revenues from partnerships with foreign oil producing companies in Sudan. For instance, the rise in oil production has led to a rapid continuous increase in the share of Sudanese government in total oil production and revenues from 23 % in 2000 to 75 % in 2005. Moreover, oil revenues have enabled Sudanese government to cover half of the total costs spent in the establishment of the Khartoum refinery.[13] The government's share in total oil revenue is influenced by the interaction between the output effect and the price effect, notably the government's share in total oil revenue increases in line with the increase of oil production and increase of oil prices in the international market and vice-versa. For instance, during the period 1997–2008 the increase in oil production led to an increase in the government's share from 25 % in 1999 to 75 %

[11] See Salih (2004), p. 166.

[12] About 40 % of oil is shipped to China (Salih 2004, p. 94). Sudan's crude oil exports have increased sharply since the completion of a major oil export pipeline in 1999. In 2004, oil imports were reported at 0 bbl/day. Sudanese domestic oil consumption averaged 82,000 bbl/d in 2005, which was a 15 % increase over the 70,000 bbl/d consumed in 2004. Return from oil exports to Sudan was US$ 500 million and US$ 600 million in 2000 and 2001 respectively. Salih (2004), p. 91.

[13] See Ministry of Finance and National Economy (2006) 'The Performance of Sudan Economy 2000–2005' (April, 2006), pp. 16–18. See also Salih (2004), pp. 182, 93.

in 2005, but the share declined to 56.7 % in 2009 due to the negative effect of the great decline in oil prices due to the decline in demand in the international market linked to the global economic crisis in 2009.

Furthermore, oil has created a positive impact on foreign trade as perceived from the volume and structure of exports, balance of trade and balance of payment. We find that oil has a positive impact on the balance of trade and balance of payments, because after the export of oil in 2001 the chronic deficit reported in the balance of trade and balance of payment turned into a surplus for the first time since independence. But this surplus in the balance of payments could not be sustained, and immediately turned into a deficit, most probably due to the increase in imports of capital goods. The same applied for the balance of trade, since oil exports represented about 95 % of total exports, it led to a positive impact in the balance of trade over the period 2000–2009 as the chronic deficit in the balance of trade turned into surplus in 2000, 2003, 2004, 2007 and 2008. While total exports grew dramatically from 7 % of GDP in 1996 to 14 % in 2006, imports remained higher at 16 % of GDP and led to a trade deficit averaging 2 % of GDP since 1999. The oil export boom raised the value of total exports from US$ 620 million in 1996 to US$ 4,522 million (1996 prices) in 2006, representing a more than 700 % increase over the decade. The large import demand of the country, the huge transport costs and other expenses related to oil operation, and the weak performance of the non-oil exports contributed to the current account deficit. The size of the current account and balance of payments deficit during 1999–2006 were however smaller compared to pre-oil exportation levels.[14]

Moreover, oil has led to a significant positive impact on GDP as perceived from the impact of oil in the structure of Sudanese economy and macro-economic indicators as measured by the share of oil in GDP, its growth rate and its composition. For instance, we observe the increasing impact of oil as measured by the rapid and continuous increase in the contribution of oil sector in GDP from 1 % in 1999 to 10 % in 2004. Furthermore, oil has led to positive impacts in real GDP growth, for instance, the average rate of growth of GDP increased from 6.2 % to 6.8 %, 8 %, 10 %, 9 % and 9.6 % over the periods 1997–1999, 2000–2009, 2005, 2006, 2005–2007 and 2006–2008 respectively, putting Sudan among the fastest growing economies in the region; Fig. 2.4 below shows that Sudan is a top growth performer in the region, with oil playing a pivotal role. Oil has led to structural change in the composition of GDP, as the dividends from oil exportation have caused major transformations and structural changes in the economy. The structure of Sudanese economy has shifted over time from being predominantly reliant on agriculture for growth and exports to its current reliance on the oil sector (see Figs. 2.5 and 2.6 below).[15]

[14] See WB-DTIS (2008), p. 7.

[15] Notwithstanding these structural shifts, agriculture remains Sudan's main driver of employment, especially outside the country's top urban areas of Khartoum and Port Sudan. Near to 35 % of Sudan's GDP comes from agricultural production, which employs 80 % of the workforce. See WB-DTIS (2008), pp. 1–3. See also 'Oil Fact Sheet on Sudan' (September 2006), p. 1.

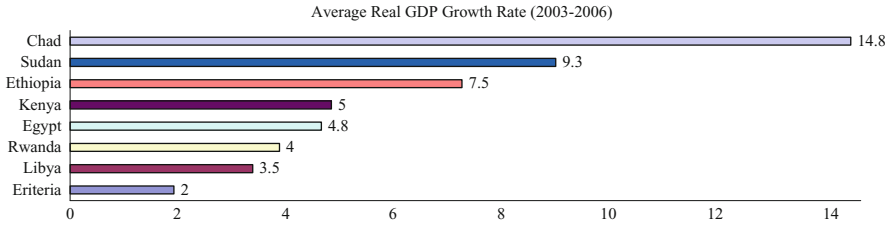


**Fig. 2.4** Average real GDP growth rate in Sudan compared to other African countries during the period (2003–2006) (Source: The World Development Indicators (WDI)/IMF/World Bank Staff Estimate 2008)

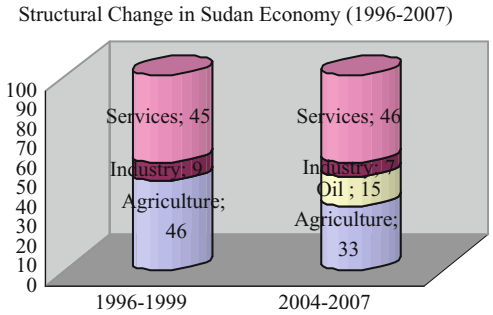


**Fig. 2.5** Structural change in Sudan economy (1996–2007) (Source: The World Development Indicators (WDI)/IMF/World Bank Staff Estimate 2008)

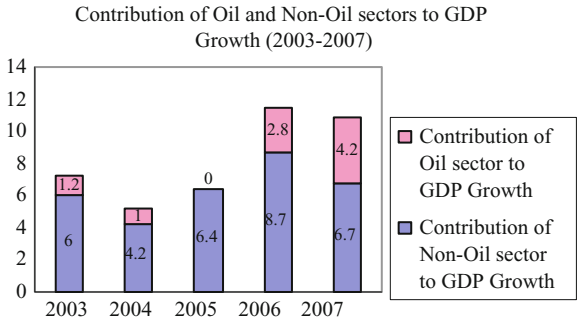


**Fig. 2.6** Contribution of oil and non-oil sectors to GDP growth in Sudan (2003–2007) (Source: The World Development Indicators (WDI)/IMF/World Bank Staff Estimate 2008)

Unlike other typical oil economies, in Sudan the impact of oil on non-oil sectors (agriculture, industry and services) remains very limited. This is noticeable from the composition or the sectoral share in GDP, as due to increasing share of oil in GDP, the contribution of industrial sectors (including oil, quarrying and mining, manufacturing, electricity and water and construction) to GDP increased to 32.3 %

in 2008 compared to 21.7 % over the period 1999–2004, while the contribution of both agricultural and service sectors declined, which clearly indicates the limited impact of oil in the agricultural and service sectors over the short run. However, over the long run these sectors may benefit from the impact of oil sector development. Currently, the impact of oil is limited to only three branches of the services sector. For example, the oil sector has led recent growth, both in terms of direct value-added to the economy as well as the associated investment boom and boost to services such as transport and construction. The emergence of the oil sector adds directly to GDP and has induced growth in certain service sectors. The construction sector has grown by about 10 % per annum since 1999 and has been the fastest growing sector in recent years, even surpassing the growth in the oil industry. Trade, restaurants and hotels have also flourished, mainly in the country's capital, and generated about one fifth of non-oil domestic product during 1996–2006.

Furthermore, the positive impact of oil in the government's public budget is perceived from the contribution of oil revenues in public finances and budget as it leads to a significant increase in government revenues and spending over the period 1999–2009. For instance, we observe the large and increasing share of oil revenues in total revenues that grew from 43 % in 2000 to 50 % and 66 % in 2006 and 2008 respectively. Despite continuous government efforts to increase the share of non-oil revenues in total revenues, the share of oil revenues in total revenues remains significant at about 50 % over the period 1999–2004, but this share declined significantly to 34 % in 2009, most probably due to the impact of the global economic crisis. Therefore, this implies the urgent need to avoid the heavy dependence on oil revenues. On the other hand the impact of oil on government expenditure is obvious from the increasing share of oil in public spending. Moreover, development spending also increased as its share in public expenditures increased from 21 % over the period 1996–1999 to 24 % over the period 2000–2004. But despite the increase in development expenditure from public expenditure from 9 % in 1999 to 31 % in 2004, its share declined and flattened out to 24 % within total public spending over the period 2006–2009.[16]

Oil created a positive impact on FDI to Sudan and motivated the increase in FDI inflow to Sudan. The implementation of economic reform policies, liberalisation and privatisation in the late 1990s, together with the exploitation of oil in 1999, and the Investment Encouragement Act of 2003, all encouraged high and increasing inflow of FDI to Sudan (see Table 2.5 above). In particular, the exploitation of oil in 1999 encouraged the inflow of FDI. For instance, according to the Arab Human Development Report (2003) the estimated net FDI flow to Sudan increased from US$ 392 million in 2000 to US$ 574 million in 2001.[17] In addition, we find that the volume of investment increased over the period 1996–2004 from US$ 251.3 to US$ 1,381

[16] See 'Sudan Factsheet Human Rights and Oil Workshop – January 31' (2003), p. 2.

[17] See the UNCTAD 'World Investment Report' (2002). See also 'Arab Human Development Report' (2003), Table 5.1, p. 102.

million, which implies that the rate of growth is near to about 500 %.[18] Moreover, in 2006, the levels of FDI in Sudan were amongst Africa's highest with over US$ 3.5 billion. From annual averages of US$ 100–200 million prior to 2000, in 2006 net FDI and portfolio inflows were US$ 3.5 billion, though tailing off to US$ 3 billion in 2007.[19,20] For 2009 however, FDI inflow decreased due to the global shock resulting in lower global oil prices, stagnating domestic oil production and related reduction in government spending. Due to increasing investment in oil, the sectoral distribution implies that the large share of FDI was concentrated on the energy and mining sector (74.7 %, 73 %), followed by industry (9.1 %, 10 %), agriculture (8.6 %, 2 %) and services sector (7.6 %, 15 %).[21] This implies that oil enables Sudan to emerge as one of the highest recipients of FDI in the African and Arab regions.

Moreover, concerning the impact of oil in enhancing capacity building, we are aware of the fact that it may be useful to depart from the analysis of the general standardised approach of examining only the macro-economic impact of oil, and to use a more indepth analysis to examine the effect of production and export of oil (natural resource-based exports) on capacity-building including education, training, science and technology (S&T) and R&D infrastructure and the growth and development trajectory of Sudanese economy. But our attempt to briefly examine the impact of oil on capacity building is constrained by the lack of reliable data at the macro and micro levels and also by the fact that Sudan is a relatively new exporter. We find that most probably the impact of oil in capacity building including education, training, S&T and R&D infrastructure might still be very limited as the country is a relatively new exporter since 1999. Furthermore, the impact on oil in the development expenditures implies that it is not at all clear and is somewhat problematic to distinguish the share and growth of spending on education, training and R&D that were mainly attributed to production and export of oil. It is clear that at the macro level the share of spending on education and R&D as a percentage of GDP most probably remained almost the same without reporting a significant change in the pre- and post-oil periods.[22]

Therefore, our findings in this section prove the first part of our hypothesis that oil created a positive impact on Sudanese economy.

---

[18] Despite the huge export earnings from oil, the current account balance has been in deficit at 8 % of GDP on average during 1999–2005. This is partly induced by increased imports of manufactured, machinery and transport equipments and other commodities. The impact of these expenses in the overall balance of payments is subdued by the influx of FDI. In 2004 and 2005, the influx of FDI led to overall surplus in the balance of payments.

[19] See WB-DTIS (2008), p. 4.

[20] See the IMF 'First Review of Performance Under the 2007–2008 Staff-Monitored Program' (June 2008), p. 2, 6.

[21] See the Sudan Ministry of Finance and National Economy 'Sudan Economy in Figures' (2002), Ministry of Finance and National Economy, Macroeconomic Policies and Programme Directorate MEPPD, First Edition (2002), p. 27.

[22] For instance, we find that the significant Chinese investment in the oil sector in Sudan has motivated China to increase very limited technical support for capacity building in Sudan, though the available information implies that direct allocation of Chinese aid to training and education sector is very limited.

#### 2.3.3.2 Oil and the Challenges of Development in Sudan

After explaining the positive impact of oil and the opportunities for development it is useful to elucidate also the negative impact of oil and the challenges for development in Sudan. These include the high uncertainty, volatility and risk of dependence on highly fluctuating oil prices in the international market, unsustained oil revenues; the lack of diversification; Dutch Disease and potential future Sudan-Southern Sudan conflict.

The first challenge related to oil is that the real economic activity is currently high, but the lack of economic diversification raises concerns over longer term sources of growth and sustained development, therefore diversification towards non-oil exports is imperative for long run sustainable development strategies. Sudan has experienced a revival in its exports, but this is largely due to the export of oil. Since 1999 the exploitation of oil resources has led to large increases in national wealth, but it has also complicated macro-economic management with recent pressures toward internal and external imbalances, as well as a heightened concern for balanced growth in the non-oil sectors, which are important for sustainable growth in Sudan. On the external side, the current account has deteriorated since the oil boom and the real exchange rate has appreciated significantly. Therefore, the major challenge created by oil is the need for diversification, although oil has driven the recent surge in real economic growth. To sustain growth and provide broader income opportunities, Sudan will need to pursue a strategy of diversifying its sources of growth, including enhancing its non-oil exports (e.g. traditional agricultural exports that have provided export earnings over the past half century).[23]

Another challenge is that oil earnings enter the economy predominantly through public finance channels, yielding significant volatility for fiscal policy. The expansion in public sector expenditures has crowded out private credit and stressed the financial sector. Oil export earnings now support the majority of public finance (55 % in 2007) and expose fiscal policy to the volatilities of domestic production and international price fluctuations. Significant oil revenue volatility and shortfalls were observed in late 2006 and early 2007 resulting in the highest fiscal deficits since the macro stabilisation of the early 1990s, which accounted for 4.3 % and 3.1 % of GDP in 2006 and 2007 respectively (see Fig. 2.7 below). The volatility in revenue has greatly complicated public expenditure management.[24] Moreover, there is a considerable decline in revenue from 24,707.9 million Sudanese pounds in 2008 to 20,045.6 million Sudanese pounds in 2009, at a rate of 18.9 %, attributed to the great decline in the share of oil in total revenues that declined by about 40.0 %.[25]

One important challenge created by oil is its weak effect in improving social development indicators. For instance, despite the increase in development expenditure from public expenditure, rising from 9 % in 1999 to 31 % in 2004, its share

[23] See WB-DTIS (2008), p. viii.

[24] See WB-DTIS (2008), pp. 4–6.

[25] See the Central Bank of Sudan 'Annual Report' (2009), p. 84.

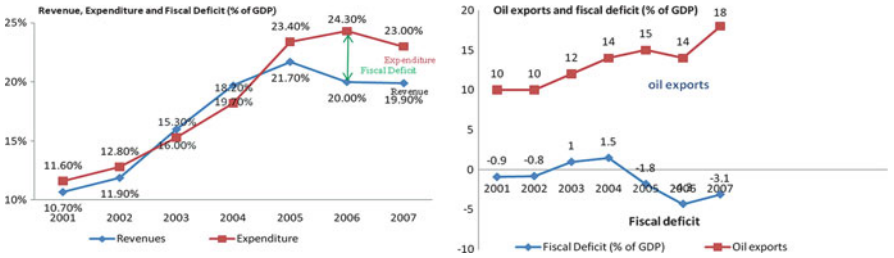


**Fig. 2.7** Sudan's fiscal position has deteriorated, while oil earnings have grown, oil exports and fiscal deficit (% of GDP) (Source: The World Development Indicators (WDI)/IMF/World Bank Staff Estimate (2008): Figure 1-3, p. 5)

then declined and flattened out at 24 % from the total public spending over the period 2006–2009. The share of development spending from oil revenues declined from 58 % in 2006 to 34 % in 2008, while the share of current spending from oil revenues increased from 42 % in 2006 to 66 % in 2008.[26] This clearly indicates the bias and deficiency in the use of oil resources on current spending instead of development spending. Despite the high oil revenues and impressive real growth, so far they are not fully utilised and do not prioritise improvement of social development indicators. Consequently, emerging vulnerabilities can be seen from poverty, regional inequalities and a low and deteriorating ranking in the Human Development Index from 147 to 150 and to 154 out of 177 world countries in UNDP-HDI in 2007, 2009 and 2010 respectively.[27,28] The low human development indicators implies that Sudan continued to fall below the Arab states and world average level over the past three decades, for instance, the trend of human development index over the period (1980–2010) implies that Sudan's level in 2010 fell below the Arab states and world average level not only in 2010 but also in 1980 (see Fig. 2.8 below). In addition to high poverty rates, according to Sudan Central Bureau of Statistics Household Survey Report (2009), about 45 % in northern Sudan are estimated to be living below the poverty line of less than US$ 1 a day. Moreover, according to UNDP (2010a), while progress has been made towards several of the Millennium Development Goals (MDG), such as in the area of education, infant and child mortality, access to water and sanitation, Sudan's performance against the MDG indicators demonstrates large inequalities with respect to gender, rural–urban residence, and at the regional and sub-regional

[26] See Sudan Ministry of Finance and National Economy (2002) 'Sudan Economy in Figures', Ministry of Finance and National Economy, Macroeconomic Policies and Programme Directorate MEPPD, First Edition (2002), p. 27.

[27] See WB-DTIS (2008), p. 6.

[28] See UNDP 'Human Development Reports' (2007; 2009; 2010a). See: http://en.wikipedia.org/wiki/Sudan, accessed June 1, 2010.

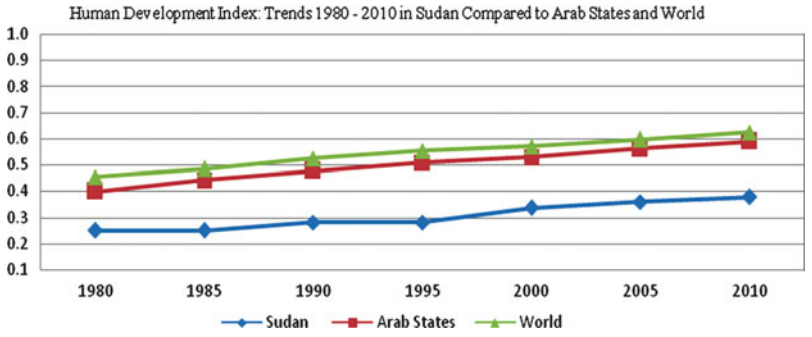


**Fig. 2.8** Human development index: trends in (1980–2010) in Sudan compared to Arab States and World (Source: UNDP Sudan Country profile of Human Development Indicators 2010) (See UNDP (2010b): http://hdrstats.undp.org/en/countries/profiles/SDN.html, Accessed on December 22, 2010)

level.[29] The significant regional disparities between regions contributed to growing inequalities and unbalanced development in Sudan (see Tables 2.6 and 2.7 below).

Another challenge related to oil is the potential for Dutch Disease. For instance, the exploitation of oil resources has led the increase in national wealth, but domestic absorption of these large inflows significantly complicates macro-economic management.[30] There is increasing debate on the potential incidence of the Dutch Disease phenomenon in Sudan's economy. On the one hand, the views in support of the potential incidence of Dutch Disease are based on the argument that

[29] The Millennium Declaration and adoption of the UN MDG in September 2000 implies commitment towards achievement of the eight MDG by 2015. The MDG are: (1) Eradicate extreme poverty and hunger: Halve, between 1990 and 2015, the proportion of people whose income is less than one dollar a day, and halve, between 1990 and 2015, the proportion of people who suffer from hunger. (2) Achieve universal primary education: Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling. (3) Promote gender equality and empower women: Eliminate gender disparity in primary and secondary education, preferably by 2005, and in all levels of education no later than 2015. (4) Reduce child mortality: Reduce by two thirds, between 1990 and 2015, the under-five mortality rate. (5) Improve maternal health: Reduce by three quarters, between 1990 and 2015, the maternal mortality ratio. (6) Combat HIV/AIDS, malaria and other diseases. (7) Ensure environmental sustainability and (8) Develop a global partnership for development. See UND-HDR 'UN MDGs in Sudan': http://www.sd.undp.org/mdg_sudan.htm, accessed June 1, 2010.

[30] Dutch Disease refers to the experience of the Netherlands in the 1960s, when the economic boom following natural gas discoveries led to a decline in manufacturing and real exchange rate appreciation. In his summary of the literature, Corden defines it as a phenomenon where a boom in one export sector, typically a windfall discovery of a new natural resource, draws factors of production from other sectors of the economy and boosts demand for non-tradeables relative to tradeables, which in turn appreciates the real exchange rate. Traditional exports collapse, due both to the internal reallocation of resources and the real exchange rate appreciation. Corden, W. M., 'Booming Sector and Dutch Disease Economics: Survey and Consolidation', Oxford Economic Papers 36 (November 1984), pp. 360–362.

**Table 2.6** The status of MDGs in Northern Sudan in 2008

| MDGs/indicators | Indicators | Status in 2004[a] | Current level[b] | Reference year | 2015 target |
|---|---|---|---|---|---|
| MDG 1 Eradicate extreme poverty and hunger | Estimated poverty incidence (% of total population) | 50 %[c] | 46.5 % | 2009 | 45 % |
| | Prevalence of child malnutrition (underweight for age; % under 5) | 35 %[c] | 31.8 % | 2006 | 16 % |
| | Prevalence of acute child malnutrition (underweight for weight; % under 5) | 16 %[c] | | | 8 % |
| MDG 2 Achieve universal primary education | Gross primary enrolment ratio | 62 % | 71.1 % | 2009 | 100 % |
| | Percentage of cohort completing primary school | 21 % | | | 100 % |
| | Adult literacy rate | 65.1 %[b] | 77.5 % | 2009 | 25 %[(c)] |
| MDG 3 Promote gender equality and empower women | Ratio girls to boys in primary education | 88 % | 53.9–46.1 % | 2007 | 100 % |
| | Women's literacy rate | 62 % | 86 % | 2009 | – |
| | Percentage of women in National Assembly/Council of States | 19 % | 25 % | 2010 | – |
| MDG 4 Reduce child mortality | Under-5 mortality rate (per 1,000) | 105[c] | 102 | 2008 | 35 |
| | Infant mortality rate (per 1,000 live births) | 70[c] | 71 | 2006 | – |
| | One-year-olds immunized against measles | 78 % | 85 % | 2009 | – |
| MDG 5 Improve maternal health | Maternal mortality ratio (per 100,000 live births) | 638[c] | 534 | 2006 | 127 |
| | Birth attended by skilled health staff | 57 %[c] | 57 % | 2006 | 90 % |
| MDG 6 Combat HIV AIDS, malaria and other diseases | Contraceptive prevalence (% of women ages 15–49) | 7 % | 7.6 % | 2006 | – |
| | HIV prevalence (% adults ages 15–49) | 1.6 %[c] | 0.5–1.24[d] | 2009 | – |
| | Incidence of TB (per 100,000 per year) | 90 | 120 | | – |
| | Children under 5 with fever treated with anti-malarials (%) | 54.2 %[c] | | | – |
| MDG 7 Integrate the principles of sustainable development into country policies and programmes; | Access to improved drinking water source (% of population) | 58.7 %[c] | 65 % | 2010 | 85 % |
| | Access to improved sanitation (% of population) | 39.9 %[c] | 42 % | 2009 | 67 % |

| | | | | | | |
|---|---|---|---|---|---|---|
| reverse loss of environmental resources | | | | | | |
| MDG 8 Develop a global partnership for development | In cooperation with the private sector, make available the benefit of new technologies, especially information and communications | Telephone line per 100 population (% of population) | 2 % | (2005) | 0.9 % | 2009 |
| | | Cellular subscribers per 100 population (% of population) | 9 % | (2005) | 28 % | 2009 |
| Internet users per 100 population (% of population) | 8.2 % (2009) | 10.4 % | 2010 | | | |

[a]Sudan Millennium Development Goals. Interim Unified Report, 2004 prepared by the UN Resident Coordinator's Support Office, Khartoum, Sudan: http://www.sd.undp.org/mdg_fact.htm, accessed in June 1, 2010.

[b]SPHS-2010, NBHS-2009, SHHS-2006 and administrative data from concerned institutions cited in pp. Sudan MDGs Progress Report 2010 (2011), Sudan National Population council, Khartoum, Sudan, 9–10.

[c]Sudan Health and Household Survey 2006.

[d]0.5 for males and 1.24 for females.

According to United Nations Development Group (2003) the proportion of population below $1 per day is the percentage of the population living on less than $1.08 a day at 1993 international prices. The poverty headcount ratio is the proportion of the national population whose incomes are below the official threshold (or thresholds) set by the national Government. Poverty gap ratio is the mean distance separating the population from the poverty line (with the non-poor being given a distance of zero), expressed as a percentage of the poverty line. Proportion of the population below the minimum level of dietary energy consumption is the percentage of the population whose food intake falls below the minimum level of dietary energy requirements. This is also referred to as the prevalence of under-nourishment, which is the percentage of the population that is undernourished. Prevalence of (moderately or severely) underweight children is the percentage of children under five years old whose weight for age is less than minus two standard deviations from the median for the international reference population ages 0–59 months. Net primary enrolment ratio is the ratio of the number of children of official school age (as defined by the national education system) who are enrolled in primary school to the total population of children of official school age. Primary completion rate is the ratio of the total

(continued)

**Table 2.6** (continued)

| MDGs/indicators | Indicators | Status in 2004[a] | Current level[b] | Reference year | 2015 target |
|---|---|---|---|---|---|

number of students successfully completing (or graduating from) the last year of primary school in a given year to the total number of children of official graduation age in the population. Literacy rate of 15–24 year-olds, or the youth literacy rate, is the percentage of the population 15–24 years old who can both read and write with understanding a short simple statement on everyday life. Ratio of girls to boys in primary, secondary and tertiary education is the ratio of the number of female students enrolled at primary, secondary and tertiary levels in public and private schools to the number of male students. The ratio of literate women to men, 15–24 years old (literacy gender parity index) is the ratio of the female literacy rate to the male literacy rate for the age group 15–24. The proportion of seats held by women in national parliaments is the number of seats held by women expressed as a percentage of all occupied seats. The under-five mortality rate is the probability (expressed as a rate per 1,000 live births) of a child born in a specified year dying before reaching the age of five if subject to current age-specific mortality rates. The infant mortality rate is typically defined as the number of infants dying before reaching the age of one year per 1,000 live births in a given year. The proportion of 1-year-old children immunized against measles is the percentage of children under one year of age who have received at least one dose of measles vaccine. The maternal mortality ratio is the number of women who die from any cause related to or aggravated by pregnancy or its management (excluding accidental or incidental causes) during pregnancy and childbirth or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, per 100,000 live births. The proportion of births attended by skilled health personnel is the percentage of deliveries attended by personnel trained to give the necessary supervision, care and advice to women during pregnancy, labour and the post-partum period; to conduct deliveries on their own; and to care for newborns. Prevalence of malaria is the number of cases of malaria per 100,000 people. Tuberculosis prevalence is the number of cases of tuberculosis per 100,000 people. HIV prevalence among 15–49 year-old adult is the percentage of adult ages 15–49 whose blood samples test positive for HIV. The proportion of the population with sustainable access to an improved water source, urban and rural, is the percentage of the population who use any of the following types of water supply for drinking: piped water, public tap, borehole or pump, protected well, protected spring or rainwater. Proportion of the urban and rural population with access to improved sanitation refers to the percentage of the population with access to facilities that hygienically separate human excreta from human, animal and insect contact. (See United Nations Development Group 2003.

**Table 2.7** Regional disparity in demographic and economic structure and achievements in MDGs in Northern Sudan (2005–2009)

| Region | | | Northern | Khartoum | Central | Kordufan | Darfur | Eastern | Total |
|---|---|---|---|---|---|---|---|---|---|
| Demographic and economic structure (2005–2008) | | | | | | | | | |
| Population[a] | 2008 | Total | 1,819 | 5,274 | 7,423 | 4,327 | 7,516 | 4,534 | 30,893 |
| | | Share (%) | 5 % | 13 % | 19 % | 11 % | 19 % | 12 % | 100 % |
| Revenues[b] | 2005 | Total | 14,853 | 15,678 | 19,267 | 9546 | 10,628 | 25,382 | 95,354 |
| | | Share (%) | 16 % | 16 % | 20 % | 10 % | 11 % | 27 % | 100 % |
| Actual per capita dederal allocation[b] | 2005 | Total | 9,068 | 8,497 | 4,872 | 3,765 | 2,732 | 2,553 | 5,248 |
| Urbanization[b] | 2005 | Total | 27 | 88 | 29 | 29 | 20 | 43 | 39 |
| MDGs[c] (2009) | | | | | | | | | |
| Poverty gap ratio | MDG 1.2 | Total | 9.4 | 6.4 | 13.8 | 23.1 | 24.6 | 17.7 | 16.2 |
| Net enrolment rate in primary education | MDG 2.1 | Total | 83 | 85 | 67 | 60 | 62 | 57 | 67 |
| Literacy rate of 15–24 years-olds | MDG 2.3.1 | Total | 88 | 94 | 77 | 69 | 74 | 63 | 77 |
| Literacy rate of 15–24 years-olds | MDG 2.3.2 | Men | 91 | 96 | 84 | 79 | 85 | 68 | 84 |
| Literacy rate of 15–24 years-olds | MDG 2.3.3 | Women | 86 | 92 | 70 | 61 | 64 | 57 | 71 |
| Share of women in wage employment in the non-agricultural sector | MDG 3.2 | Total | 15 | 19 | 13 | 19 | 22 | 12 | 17 |
| Employment ratio to population 15 years old and above | MDG 1.5 | Total | 35.9 | 37 | 41.3 | 48.5 | 45.3 | 39 | 41.4 |
| Proportion of employed population below poverty line | MDG 1.6 | Total | 30.1 | 21 | 41.5 | 55.5 | 58.8 | 39.2 | 42.5 |
| Proportion of own account and contributing family workers to total employed | MDG 1.7 | Total | 39.2 | 25.3 | 36 | 39.8 | 50 | 46.7 | 45 |

[a]Adapted from Sudan Central Bureau of Statistics Population Census Data (2010): The Fifth Sudan Population and Housing Census (2008).
[b]Elbadawi and Suleiman (2008: 107).
[c]The Sudan Central Bureau of Statistics (2011: 12).

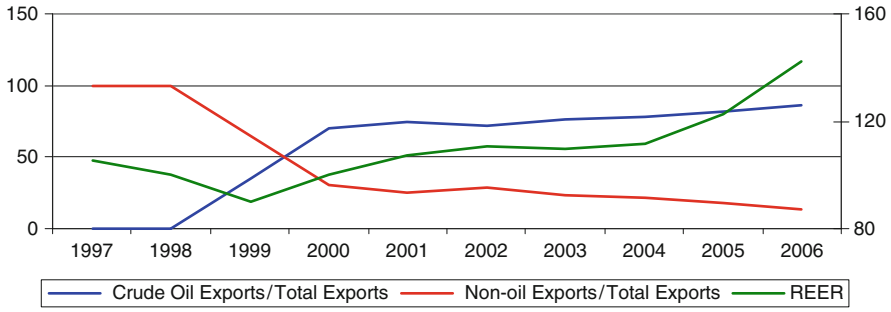


**Fig. 2.9** The trend of the share of oil exports and non oil exports in total exports and real effective exchange rate in Sudan (1997–2006) (Source: Elbadawi and Kaltani 2007)

the appreciation of the nominal effective exchange rate and the sustained increases in the general price levels led to the appreciation of real effective exchange rate in recent years. This argument indicates that the inflows through higher levels of government spending put additional pressures on the prices of non-traded goods. Prices of housing, water and electricity grew almost twice as fast as the prices of tradable goods, specifically food, clothing and consumer goods. The real effective exchange rate appreciated by 40 % in 2005–2006, which added to the more fundamental structural rigidities and supply-side constraints already faced by non-oil exporters. This argument indicates that some signs of Dutch Disease are present, though it is difficult to assess the extent of these characteristics, as the country is a relatively new exporter.[31] On the other hand, the views in suspecting of the incidence of Dutch Disease are based on the argument that the agriculture and services sector continues to dominate the economy even after the increasing share of oil in GDP over the period 1990–2009. Moreover, the rise in the share of industry in GDP is mainly attributed to the rise of the share of oil in GDP, while the share of manufacturing in GDP over the period 1999–2006 remained stagnant and the growth rate of manufacturing remained between 1 % and 3 %. This argument implies that it may be too early to confirm any Dutch Disease in Sudanese economy (Fig. 2.9, 2.10, 2.11, and 2.12).[32]

A further challenge related to the dependence on oil is the uncertainty in economic growth as measured by long run GDP and GDP per capita growth rates. This implies that Sudan must implement a strategy to avoid the negative consequences of declining growth rates in GDP and GDP per capita and uncertainty related to a drop in oil reserves by using its oil production. According to UNDP (2010), prior to the global financial crisis, Sudanese economy had been one of the

[31] See WB-DTIS (2008) p. 3. See also Elbadawi and Kaltani (2007).

[32] See Bedawi, W. F. (2007).

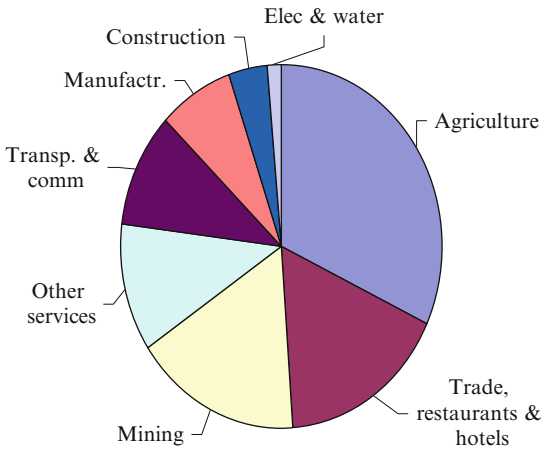


**Fig. 2.10** Where is the Dutch Disease? Agriculture and services continue to dominate the economy 2006 GDP by sectors at factor cost (Source: Bedawi 2007)

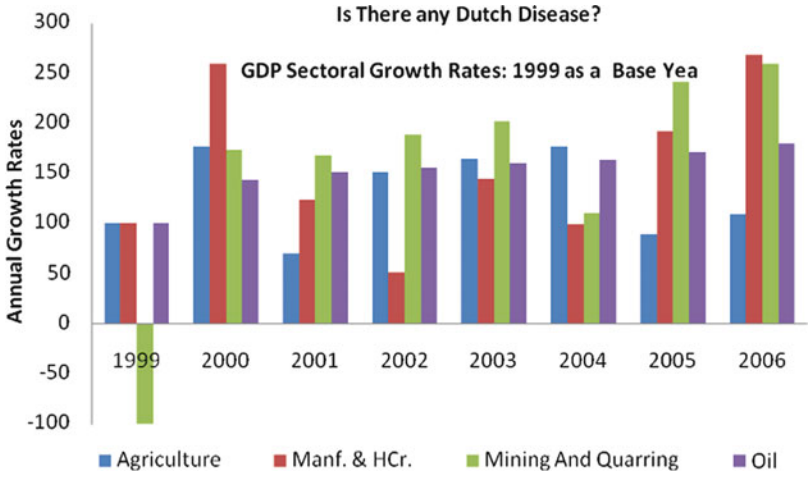


**Fig. 2.11** May be too early to say is there any Dutch Disease? Measured by the GDP sectoral growth rate over the period (1999–2006) (Source: Bedawi 2007)

fastest growing in the world, despite United States (US) sanctions. However, the global financial crisis and related shock in 2008 and 2009 resulted in low global oil prices, stagnating domestic oil production and caused a reduction in the GDP

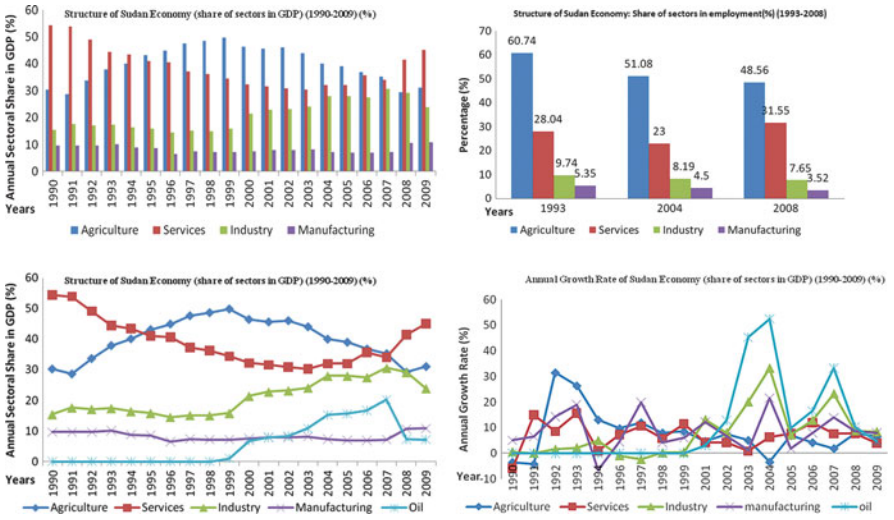


**Fig. 2.12** Structure of Sudan economy: share of sectors in GDP, share of sectors in employment and annual sectoral growth rate (share of sectors in GDP) (1990–2009) (%) (Sources: Adapted from the Central Bank of Sudan and Ministry of Finance and National Economy Annual Reports (various issues))

growth rate, dropping from 10.5 % in 2007 to 7.8 % and 5 % in 2008 and 2009 respectively (see Table 2.2 and Fig. 2.1 above).[33]

Another oil related challenge is that oil revenues create other internal problems by increasing internal tensions or conflict related to the desire to maintain control over oil resources and failure to achieve an equitable distribution of oil revenues.[34] The Comprehensive Peace Agreement (2005) states that oil revenues should be shared 50:50.[35] From a political perspective in the short run with the official secession of the Southern Sudan, there is increasing tension and potential conflict

[33] A recent IMF report ranked Sudan as one of the most vulnerable low-income countries in the global financial crisis due to its high vulnerability to trade, aid and remittances shocks. See IMF 'Report on the Implications of the Global Financial Crisis for Low-Income Countries' (March 2009), pp. 48, 50: http://www.imf.org/external/pubs/ft/books/2009/globalfin/globalfin.pdf, Accessed 10 October 2011.

[34] For instance, in the past the exploration and production of Sudan's oil has been a highly controversial issue and is affected by the continuous conflict which involves the war and conflict over controlling oil resources. "Oil has always been an issue in Sudanese conflict. For instance, the organized non-government political activity resisting oil extraction: On 30 August 1999, Sudan's pipeline with a capacity for 100,000 barrels/day filled the first tanker at the supertanker port on the Red Sea. Not one month later, on 20 September, anti-government forces exploded a portion of the pipeline outside the town of Atbara. Moreover, due to conflict, oil exploration has been mostly limited to the central and south-central regions of the country". 'Sudan Factsheet Human Rights and Oil Workshop', (January 31, 2003), pp. 1–2. See also 'Oil Fact Sheet on Sudan' (2006), pp. 1–2.

[35] See for instance, Oil Fact Sheet on Sudan' (September 2006), p. 2.

between Sudan and Southern Sudan that threatens stability and sustainability. This increasing tension is attributed to the fact that the two sides have not reached an agreement on the division of oil revenues after secession. According to official estimates since 70 % of Sudan's crude is pumped in Southern Sudan and since the main oil pipeline, refinery and seaport are located in Sudan, this suggests that Sudanese economy will be affected negatively and lose most of the oil reserves (70 %) and oil revenues (50 %) and Southern Sudan will remain dependent on the main pipeline passing through the north. Even after Southern Sudan's independence, Sudan will remain the former's only export route through a pipeline ending in the seaport of Port Sudan in the Red Sea. This also implies that Sudanese government needs to invest in agriculture and non-oil industries, and that both Sudanese and Southern Sudanese governments need to take measures to counter the negative impacts and ensure their mutual benefit. This demonstrates how oil remains a controversial issue in Sudan-Southern Sudan conflict, and also creates more potential for future conflict between Sudan and Southern Sudan.

Oil has also affected the labour market because the exploration and production of oil leads to the creation of more employment opportunities, although this is difficult to elaborate due to a lack of accurate data.[36] The inflow of FDI and the increased wealth from oil has encouraged migration to Sudan, so migrant workers have increased in the labour market, particularly in the private sector, which may also contribute to the growing unemployment rate. Furthermore, oil has also affected the structure of wages and has led to a wage differential in Sudan; for instance, the results of the comprehensive industrial survey (2005) indicates that the highest salary for workers in the industrial sector is reported in the petroleum refining industry which is 18 times more than the average wage in the industry.[37]

Our findings in this section therefore prove the second part of our hypothesis: that oil has had a negative impact on Sudanese economy.

[36] For instance, of the total labour force estimated at 97,000,000 in 2001, the share and contribution of oil industries in total employment is very minimal and accounted for only 0.0087 % of total employment of labour force and only 0.52 % of total employment in the industrial manufacturing sector in Sudan. It is worthy to note that the contribution of oil industries represent only 0.52 % of total employment and 0.64 % of total number of labour employed in the industrial manufacturing sector in Sudan (2001) but in the meantime oil industries is ranked second in terms of the contribution to industrial value added as it accounts for 11 % of total industrial value added in the manufacturing industries in Sudan; this implies that oil industries tend to use more capital intensive techniques and to be a more capital intensive industry. See for instance, Sudan Central Bureau of Statistics 'Statistical Year Book' (2001), Khartoum, November 2003, for the data on the total number of labor force in Sudan in 2001. See Sudan Ministry of Industry 'Comprehensive Industrial Survey data for 2001' (2005), Tables 12–13; the industrial survey, pp. 72–75, for the data on total number and share of oil in total employment and in employment in the industrial manufacturing sector in Sudan in 2001.

[37] See the 'Executive Summary of Sudan Comprehensive Industrial Survey' (2005), p. 29.

## 2.4 Structural Problems of Labour in Sudan

Based on the above, in this section it is useful to start by explaining the stylised facts on the characteristics and structural problems of labour market in Sudan. First we explain the relation between the structure of labour market and the demographic structure, participation rates and economic activities, second we show the relation between the structure of labour market and the low skill level and brain drain problems and finally we examine the relation between the structure of labour market and the unemployment and youth unemployment problems in Sudan.

### *2.4.1 Demographic Structure, Participation Rate and the Declining Productivity of Labour and Economic Growth in Sudan*

Before explaining the relation between the structure of labour market and the demographic structure, participation rate and economic activities, it is useful to identify the major stylised facts and characteristics of the labour market in Sudan. For instance, one stylised fact that characterises the labour market in Sudan as in many other Arab and typically developing countries, is the dominance – reflected in the large share – of the public (government) sector in total employment compared to the weakness of the private sector. The organisational structure of the labour market is constrained by weak and inefficient regulations and institutional settings, rigidity and lack of dynamism, deficiency in employment, monitoring, planning and skill upgrading; the high incidence of duality (rural–urban; traditional-modern and formal-informal sectors) and prevalence of high rates of unemployment, especially among youth population and child labour.[38] In addition the labour market is characterised by low participation rates, especially low participation rates for women and the mismatch between educational output (supply) and labour market requirements (demand). These distinctive features of Sudanese and Arab labour markets were caused by such fundamental forces as high population and labour force growth rates, macroeconomic fluctuations caused by oil price instability, and the pervasive role of the state in the region's economic activity. A demographic transition which resulted in rapid population growth, slow down in labour absorption, combined with large-scale shifts of population from rural to urban areas, led to severe pressures on labour markets, especially in urban areas.[39] In addition, there is

[38] Based on the UNDP (2010) definition of child labour as the percentage of children aged 5–14 in the labour market, the UNDP-HDR (2010a) indicates the high rates of child labour in Sudan as the percentage of children aged 5–14 in the labour market accounted for 13 % of children aged 5–14 over the period (1999–2007). See UNDP-HDR (2010a), p. 191.

[39] See for instance, Shaban et al. (1995).

increasing debate that in the Arab oil-dependent countries, the structure of labour market suffers from the impact of the Dutch Disease phenomenon.

One stylised fact of the labour market in Sudan related to demographic structure indicates continuous and rapid increase in total population from 10 million in 1956 to 39 million in 2008, and increase in the growth rate in total population from 2.1 in 1956 to 2.8 in 2008 (see Fig. 2.13 below). According to the Central Bureau of Statistics (2010), data from the 2008 population census indicates that the distribution of population according to the mode of living implies that the majority of Sudan's total population are rural and nomadic (70.5 %) compared to the minority of the urban population (29.5 %). Furthermore, the distribution of population according to gender implies that the majority of Sudan's population are male (51.27 %) compared to female (48.73 %). Moreover, the distribution of population according to age implies that the majority of Sudan's total population are aged 5–24, representing about 47.38 % of Sudan's total population in 2008. In addition, the share of population aged 17 and over (52.85 %) is higher than the share of population aged 16 or less (47.15 %) (see Table 2.8 and Fig. 2.13 below).[40] This structure and distribution of total population by mode of living, gender and age will have several important implications in the structure of labour market, notably, labour force, participation rates, economic activities, skill level, employment and unemployment rates as we will explain in this section below.

For instance, we observe that the first implication and stylised fact in the labour market in Sudan is that the continuous increase in the total population implies continuous increase in the total labour force from 16.5 in 1998 to 22.5 in 2008 and also increasing though low participation rates.[41] The demographic structure, labour force and participation rate in Sudan implies the low share of Sudanese women in the labour force (31.1 %) as compared to Sudanese men (72.2 %) and the total Sudanese labour force (52.4 %), and the low participation rate (for 15–24 year olds) for Sudanese women (6.08 %) as compared to Sudanese men (15 %) and the total Sudanese participation rate (10.08 %). Both crude and adjusted participation rates show continuous rapid increase in the period 1990–1996 in Sudan. Our findings indicate that compared to 1996, in 2008 the crude participation rates for the total population increased to (43.68 %), but they declined for men (28.99 %) and for women (14.69 %), whereas adjusted participation rates declined for men (57.90 %) and increased for women (29.42 %). Both crude and adjusted labour force participation rates in economic activities defined by mode of living and gender, indicate that the participation rates are higher for people (men and women) living in rural areas compared to people (men and women) living in urban areas and participation rates for women are less than men over the period

[40] See Sudan Central Bureau of Statistics (2008) 'Central Bureau of Statistics: Sudan Statistics and Statistical Year Book: Sudan (1990–2008)' (2008), p. 3.

[41] See for instance, data from: Arab Labour Organization; Sudan Ministry of Labour and Public Service: Migration and Labour Force Surveys 1993 and 1996; and Sudan Central Bureau of Statistics (2010) 'Fifth Sudan Population and Housing Census (2008)'.

**Table 2.8** Economically active population according to economic activities (sectoral classification) and employment status defined by gender in Sudan in 1993–2008 (%)

| | 1993 | | | 2004 | | | 2008 | | | 2008 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Economic activities | M | W | MW | M | W | MW | M | W | MW | M | W |
| Agriculture, hunting, forestry and fishing | 38.79 % | 21.94 % | 60.74 % | 32.6 | 18.46 | 51.08 | 32.57 % | 16.00 % | 48.56 % | 48.13 % | 49.48 % |
| Industry | 9.09 % | 0.65 % | 9.74 % | 7.63 | 1 | 8.19 | 6.92 % | 0.73 % | 7.65 % | 10.22 % | 2.27 % |
| Manufacturing | 4.81 % | 0.54 % | 5.35 % | 4.04 | 0.46 | 4.5 | 3.09 % | 0.43 % | 3.52 % | 4.57 % | 1.32 % |
| Services | 23.51 % | 4.53 % | 28.04 % | 19.61 | 4 | 23 | 24.29 % | 7.26 % | 31.55 % | 35.90 % | 22.45 % |
| Activities not adequately defined or classified | 1.07 % | 0.41 % | 1.49 % | 0.64 | 0.56 | 1.2 | 3.89 % | 8.34 % | 12.24 % | 5.75 % | 25.80 % |
| Total | 72.46 % | 27.54 % | 100.00% | 60.48 % | 24.02 % | 83.47 % | 67.67 % | 32.33 % | 100.00 % | 100.00 % | 100.00 % |

Sources: Adapted from Arab Labour Organization (2007), (2) Central Bureau of Statistics – Department of Internal Commerce and Pricing. (3) Own calculation based on Sudan Central Bureau of Statistics Population Census Data (2010): The Fifth Sudan Population and Housing Census (2008)

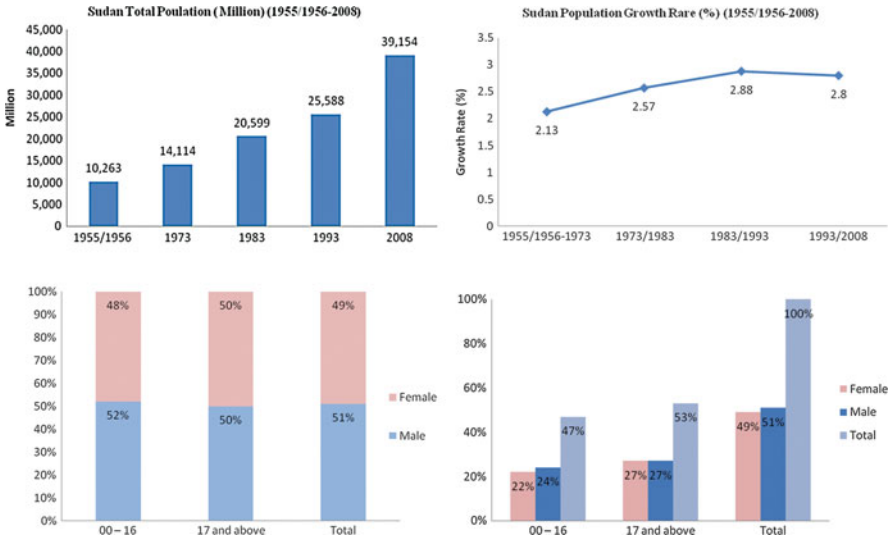


**Fig. 2.13** Total population (million) and population growth rare (%) in Sudan over the period (1955/1956–2008) and the distribution of Northern Sudan Total Population defined by age and gender (2008) (Source: Adapted from Sudan Central Bureau of Statistics Population Census Data (2010): The Fifth Sudan Population and Housing Census 2008)

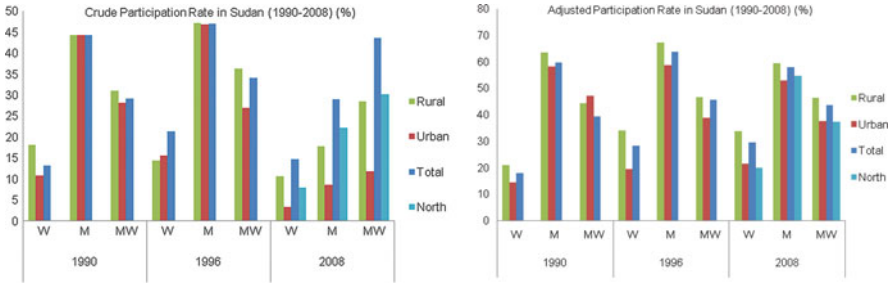


**Fig. 2.14** Crude and adjusted participation rate define by gender and mode of living in Sudan (1990–2008) (%). Sources: (1) Figures for 1990 obtained from Ministry of Labour and Administration Reform- Department of Planning and Monitoring and Follow-up. (2) Figures for 1996 obtained from Central Bureau of Statistics – Migration and Labour Force Survey 1996. (3) Central Bureau of Statistics – Department of Internal Commerce and Pricing. (4) Figures for 2008 obtained from own calculation based on Sudan Central Bureau of Statistics Population Census Data (2010): The Fifth Sudan Population and Housing Census (2008), (4) Note: Figures for 1998 from Ministry of Finance and National Economy – Annual Economic Survey 2000, Table 7-2, p. 10

1990–2008 (see Fig. 2.14 above). These findings are consistent with the observed findings from the 1993 population census and 1996 migration and labour force survey. These findings are also consistent with the structure and distribution of population in Sudan in 2008 defined by gender and mode of living as we explained above (see Figs. 2.13 and 2.14 above).

1990–2008 – see Fig. 2.14 above. These findings are consistent with the observed findings from the 1993 population census and 1996 migration and labour force survey. These findings are also consistent with the structure and distribution of population in Sudan in 2008 defined by gender and mode of living as we explained above – see Figs. 2.13 and 2.14 above.

Another stylised fact on the structure of the labour market in Sudan is the inconsistent distribution of economically active population defined according to major economic activities (sectoral classification) and gender. For example, the majority of Sudanese are employed in agriculture sector (51.8 %, 48.56 %), followed by services sector (23 %, 31 %), industry (8.9 %, 7.65 %) and finally few are employed in other activities (1.2 %, 12.24 %) in 2004 and 2008 respectively.[42,43] This structure implies that agriculture is still the predominant activity in Sudan, although its share in employment has gradually declined as other sectors of economic activity have expanded. In the 2008 census almost 48.56 % of the work force were involved in the agriculture sector, compared with 60.74 % in 1993 and 51.08 % in 2004. Services, which included a government work force that grew in terms of employment, emerged as the second largest area of activity, encompassing an estimated 31.55 % of the economically active population in 2008, compared with 28.04 % in 1993 and 23 % in 2004. The industrial sector accounted for 7.65 % in 2008 compared to about 9.74 % in 1993 and 8.19 % in 2004 (see Table 2.8 below). Sudan Central Bureau of Statistics (2010) population census data for 2008 indicates that the distribution of economically active population defined by major economic activities (sectoral classification) and gender implies that the majority of Sudanese men are employed in the agriculture sector (48.13 %), followed by services (35.9 %), industry (10.22 %) and other activities (5.75 %); similarly, the majority of Sudanese women are employed in the agriculture sector (49.48 %), followed by services sector (22.45 %), industry (2.27 %) and other activities (25.8 %). Employed Sudanese men constitute the majority of total employment in all sectors (67.67 %), whereas employed Sudanese women constitute the minority of total employment in all sectors (32.33 %). Sudanese men employed in agriculture, services and industry sectors (32.57 %, 24.29 % and 6.92 % respectively) are higher than Sudanese women employed in these sectors (16 %, 7.26 % and 0.73 % respectively). This implies that Sudanese men employed in agriculture, services and industry sectors are near to twice, near to three times, and near to seven times more than Sudanese women employed in these sectors respectively. These findings are consistent with the results from the 1993 population census and 1996 migration and labour force survey. These findings are also consistent with the structure and distribution of population in Sudan in 2008 defined by gender as we explained above.

[42] See for instance, the Arab Labour Organization (2007) for data for 2004 and Sudan Central Bureau of Statistics (2010) population census for data for 2008.

[43] Agriculture sector includes livestock raising, forestry, fisheries, or hunting, services sector includes government work force, wholesale and retail trade, restaurants and hotels, transport, storage and communication, financing, insurance, real estate and business services, community, social and personal services and the industrial sector includes manufacturing, mining, electric power, and construction.

### 2.4.2 The Low Skill Level and Brain Drain Problem in Sudan

Another stylised fact on the structure of labour market in Sudan can be observed from the skill level defined by occupation (defined by the international definition of major occupational groups classification) and education (defined by school attendance, literacy and education attainment) defined by gender. For example, the definition of skill according to occupation classification indicate that the majority of Sudanese economically active population or workers are medium and low skilled (86 %, 88 %) and minority (14 %, 12 %) are high skilled in 2004 and 2008 respectively.[44] In 2004 only 14 % of men were highly skilled and 86 % are medium and low skilled, and only 15 % of women were highly skilled and 85 % medium and low skilled; women were slightly more skilled than men. In 2008 only 13 % of men were highly skilled and 79 % medium and low skilled, and only 10 % of women were highly skilled and 84 % medium and low skilled; men were slightly more skilled than women. The majority of Sudanese workers were employed in blue collar occupations (70 %, 69.4 %), while the minority were employed in white collar occupations (30 %, 24.4 %) in 2004 and 2008 respectively. In 2004 only 33 % of men were employed in white collar occupations, while 67 % of men were employed in blue collar occupations; only 24 % of women were employed in white collar occupations, while 76 % of women were employed in blue collar occupations. In 2008 only 23.24 % of men were employed in white collar occupations, while 73.42 % of men were employed in blue collar occupations; only 26.9 % of women were employed in white collar occupations, while 61.03 % of women were employed in blue collar occupations (see Table 2.9 below). Moreover, our results from Sudan Central Bureau of Statistics (2010) population census data for 2008 indicate the low skill level and differences in skill level in Sudan that appear in terms of low school attendance, literacy rate and education attainment defined by gender and mode of living. For instance, the distribution of total Sudan population aged 6 years and over according to school attendance and literacy rate, implies that only little above half of Sudan's population aged 6 years and over are currently and/or previously attending school (50.87 %) and are literate (51.59 %), while near to half of Sudan's population aged 6 years and over have never attended school (44.62 %) and are illiterate (45.19 %). The distribution of population aged 6 years and over according to education attainment and currently and/or previously school attendance implies that the majority have less than secondary education and intermediate, primary or less than primary education (76.80 %), this is followed by secondary and post secondary diploma education (13.93 %), and finally followed by a only minority with above secondary education (5.32 %), including university first degree and college education (4.70 %) and post graduate

[44] See for instance, the Arab Labour Organization (2007) for data for 2004 and Sudan Central Bureau of Statistics (2010) population census for data for 2008.

**Table 2.9** Economically active population defined according to major occupational groups classification, defined by gender in Sudan (2004–2008) (%)

| | 2004 | | | 2008 | | | 2008 | | |
|---|---|---|---|---|---|---|---|---|---|
| Major occupational groups[a] | M | W | MW | M | W | MW | M | W | North |
| White Collar high skilled (WCHS) | 14.05 % | 14.82 % | 14.27 % | 8.61 % | 2.94 % | 11.55 % | 12.73 % | 9.08 % | 10.10 % |
| White Collar low skilled (WCLS) | 19 % | 9.05 % | 16.2 % | 7.11 % | 5.76 % | 12.88 % | 10.51 % | 17.83 % | 6.09 % |
| Blue Collar high skilled (BCHS) | 46.90 % | 69.59 % | 53.26 % | 28.58 % | 15.28 % | 43.86 % | 42.24 % | 47.25 % | 24.13 % |
| Blue Collar low skilled (BCLS) | 20.04 % | 6.53 % | 16.25 % | 21.10 % | 4.46 % | 25.56 % | 31.18 % | 13.78 % | 22.03 % |
| Not stated | | | | 2.26 % | 3.90 % | 6.16 % | 3.35 % | 12.06 % | 6.16 % |
| Total | 100.00 | 100 | 100 | | | | | | |
| White Collar (WC = WCHS + WCLS) | 33.05 % | 23.87 % | 30.47 % | 15.72 % | 8.70 % | 24.42 % | 23.24 % | 26.90 % | 16.19 % |
| Blue Collar (BC = BCHS + BCLS) | 66.94 % | 76 % | 70 % | 49.68 % | 19.73 % | 69.41 % | 73.42 % | 61.03 % | 46.16 % |
| High skilled (HS = WCHS) | 14 % | 15 % | 14 % | 8.61 % | 2.94 % | 11.55 % | 12.73 % | 9.08 % | 10.10 % |
| Medium and low skilled (MLS = WCLS + BCHS + BCLS and not stated) | 86 % | 85 % | 86 % | 56.79 % | 25.50 % | 88.45 % | 82.21 % | 95.99 % | 58.41 |

Sources: Adapted from the Arab Labour Organization (2007), (2) Central Bureau of Statistics – Department of Internal Commerce and Pricing. (3) Own calculation based on Sudan Central Bureau of Statistics Population Census Data (2010): The Fifth Sudan Population and Housing Census (2008)

[a]The ILO International Standards Classification of Occupations (ISCO) are aggregated in the following way (high skilled includes only the category of WCHS, while medium and low skilled include all other categories: WCLS, BCHS and BCLS):

White-Collar high-skilled (WCHS) includes legislators, senior officials, managers, professionals, technicians and associate professionals.

White-Collar low-skilled (WCLS) includes clerks, services workers, shop and market sales workers.

Blue-Collar high-skilled (BCHS) includes skilled agricultural and fishery workers, craft and related trade workers.

Blue-Collar low-skilled (BCLS) includes plant and machine operators and assemblers and elementary occupations.

diploma, Master's degree and PhD degree (0.62 %).[45] In addition, the distribution of population aged 6 years and over according to current school attendance implies that the majority have less than secondary education and intermediate, primary or less than primary education (73.59 %), followed by secondary and post secondary diploma education (15.40 %), and finally followed by only a minority with above secondary education (6.12 %) – including 5.92 % with university first degree and college education and 0.20 % with Master's and PhD degree education. Moreover, our results from Sudan Central Bureau of Statistics (2010) population census data for 2008 indicate the low skill level and differences in skill level in Sudan that appear in term of low school attendance, literacy rate and education attainment defined by gender and mode of living. For instance, the skill level (defined by school attendance, literacy rate and education attainment) for males is higher than females and for urban are higher than rural population (see Table 2.10 below). These findings are consistent with the structure and distribution of population in Sudan in 2008 defined by gender and mode of living as we explained above.

One stylised fact on the labour market in Sudan is that for a long time Sudan has remained a labour exporting country, especially to the oil rich Arab Gulf countries, and many Sudanese men have worked in other Arab Gulf states; the migration of highly skilled individuals has led to a brain drain problem in Sudan.[46] Based on the

[45] The distribution of population aged 6 years and over according to education attainment and currently and/or previous school attendance implies that about 8.3 % of total Sudan population aged 6 years and over are without educational attainment. It implies that the majority have below primary education (42.58 %), this is followed by primary education (14.84 %), secondary education (12.83 %), intermediate education (4.84 %), university first degree education (4.70 %), post secondary diploma education (1.10 %), postgraduate diploma education (0.29 %), Master's degree (0.24 %) and Ph.D. degree (0.09 %).

[46] "The term human capital flight, more commonly referred to as "brain drain", is the large-scale emigration of individuals with technical skills or knowledge. The reasons usually include two aspects which respectively come from countries and individuals. In terms of countries, the reasons may be social environment (in source countries: lack of opportunities, political instability, economic depression, health risks; in host countries: rich opportunities, comparatively good political system, developed economy, better living conditions). In terms of individual reasons, there are family influences (overseas relatives, and personal preference: preference for exploring, ambition for an improved career, etc.). Although the term originally referred to technology workers leaving a nation, the meaning has broadened into: "the departure of educated or professional people from one country, economic sector, or field for another, usually for better pay or living conditions". Brain drain is usually regarded as an economic cost, since emigrants usually take with them the fraction of value of their training sponsored by the government or other organizations. It is a parallel of capital flight, which refers to the same movement of financial capital. Brain drain is often associated with de-skilling of emigrants in their country of destination, while their country of emigration experiences the draining of skilled individuals. The term brain drain was coined by the Royal Society to describe the emigration of "scientists and technologists" to North America from post war Europe. Another source indicates that this term was first used in the United Kingdom (UK) to describe the influx of Indian scientist and engineers. The converse phenomenon is "brain gain", which occurs when there is a large-scale immigration of technically qualified persons. Brain drain is common amongst developing nations, such as Africa, former colonies of the island nations of the Caribbean, and particularly in centralized economies such as

conventional views in the literature on the incidence of brain drain in typically developing countries, in our view the main reasons for the incidence and continuation of brain drain in Sudan can be perceived from both national and personal perspectives. From the national perspective, the main reasons are related to the internal environment in Sudan due to lack of employment opportunities, political instability and economic instability; in host countries there are rich employment opportunities and better living conditions. From the personal perspective, the main reasons include family influences, overseas relatives and personal preference for an improved career, and better living conditions. The most important reason for the continuation of brain drain in Sudan is that the low standard of economic development has led to low GDP per capita, which implies that high skills are not financially rewarded. The main consequences of the brain drain problem in Sudan is that brain drain is regarded as an economic cost, since emigrants usually take with them the fraction of value of their training sponsored by the government or other organisations. Moreover, brain drain implies that Sudan experiences the draining of skilled individuals and this contributes to vicious circle of underdevelopment in Sudan as a low-income country. This problem of brain drain implies a loss to Sudan that may have amounted to a considerable percentage of its professional and skilled work force. For instance, over the period 2005–2008 the average share of white collar high and white collar Sudanese migrants workers represented about 8.57 % and 11.39 % of total Sudanese migrant workers respectively. Notably, the share of white collar high continuously increased from 5.87 % to 9.42 %, 7.71 % and 9.83 % in 2005, 2006, 2007 and 2008 respectively, and the share of white collar increased from 12.66 % to 13.03 %, 18 % and then declined to 6.6 % in 2005, 2006, 2007 and 2008 respectively (see Table 2.11 below).

In addition, as a result of the brain drain problem which implies a shortage of professional and skilled Sudanese workers, we find the recent phenomena of brain gain of foreign skilled workers which is most probably related to the effects of globalisation and increasing foreign investment, notably foreign investment in the oil sector, which is largely dependent on foreign skills and foreign capital; the easy inflow and employment of foreign workers has caused serious implications because of competition with the local and domestic workers. The presence and high share of skilled foreign workers in total employment of foreign workers means that the

---

former East Germany and the Soviet Union, where marketable skills were not financially rewarded. Two parties involved in brain drain are developing countries and developed countries. On the left side, because of the disadvantaged social environment (of opportunities, political instability, economic depression, health risks, etc), family influence (overseas relatives, etc), and personal preference (prefer exploring, ambitious to seek brilliant career, etc), many people in developing countries actively choose to migrate. Most of migrations from developing countries are those wealthy or skilled people, whose leaving results in brain drain and slow development of home countries. This contributes to a vicious circle for developing countries (low-income countries). On the other side, the advantaged social environment (rich opportunities, comparatively good political system, developed economy, better living conditions, etc) in developed countries attract talents from other areas, which contribute to brain drain, and finally forms a virtuous circle". See: http://en.wikipedia.org/wiki/Brain_drain, accessed November 14, 2010.

**Table 2.10** Sudan-population 6 years of age and over by school attendance, literacy, currently and previously attending school defined by age, gender and mode of living (2008)

| | Currently | Previously | Total | | | | Literate | Illiterate | Not stated | |
|---|---|---|---|---|---|---|---|---|---|---|
| (a) Sudan-population 6 years of age and over by school attendance and literacy defined by age, gender and mode of living | | | | | | | | | | |
| Group | Attended (currently and previously attended) | | | Never attended | Not stated | Total | Literacy | | | Total |
| | Currently | Previously | Total | | | | Literate | Illiterate | Not stated | |
| Total | 25.50 % | 25.38 % | 50.87 % | 44.62 % | 4.51 % | 100 % | 51.59 % | 45.19 % | 3.22 % | 100 % |
| Male | 14.07 % | 14.49 % | 28.57 % | 19.78 % | 2.01 % | 50.35 % | 29.05 % | 19.78 % | 1.52 % | 50.35 % |
| Female | 11.42 % | 10.88 % | 22.30 % | 24.84 % | 2.50 % | 49.65 % | 22.54 % | 25.41 % | 1.70 % | 49.65 % |
| Urban | 10.44 % | 11.89 % | 22.33 % | 7.02 % | 1.22 % | 30.57 % | 22.56 % | 7.21 % | 0.80 % | 30.57 % |
| Rural | 14.47 % | 13.03 % | 27.50 % | 31.88 % | 2.83 % | 62.20 % | 27.90 % | 32.31 % | 1.99 % | 62.20 % |
| Nomad | 0.59 % | 0.46 % | 1.04 % | 5.72 % | 0.47 % | 7.23 % | 1.13 % | 5.68 % | 0.43 % | 7.23 % |
| (b) Sudan population 6 years of age and over currently and previously attending school by education attainment, age, gender and mode of living | | | | | | | | | | |
| Group | Total | Below secondary: intermediate, primary and below | | | | Secondary and post secondary diploma | Primary and | | | |
| | | | | intermediate and secondary | | University first degree and colleges | Above university | | Not stated | |
| Total | 100 % | 76.80 % | 13.93 % | 94.22 % | | 4.70 % | 0.62 % | | 3.97 % | |
| Male | 56.16 % | 43.29 % | 7.80 % | 52.94 % | | 2.52 % | 0.39 % | | 2.15 % | |
| Female | 43.85 % | 33.50 % | 6.13 % | 41.26 % | | 2.18 % | 0.21 % | | 1.82 % | |
| Rural | 43.89 % | 29.56 % | 8.52 % | 39.70 % | | 3.51 % | 0.47 % | | 1.83 % | |
| Urban | 54.06 % | 45.42 % | 5.32 % | 52.48 % | | 1.17 % | 0.13 % | | 2.02 % | |
| Nomad | 2.05 % | 1.81 % | 0.10 % | 2.02 % | | 0.02 % | 0.00 % | | 0.12 % | |
| (c) Sudan population 6 years of age and over currently attending school by grade attending, age in single years and sex | | | | | | | | | | |
| Total | 100.00 % | 73.59 % | 15.40 % | 88.68 % | | 5.92 % | 0.20 % | | 4.89 % | |
| Male | 55.20 % | 40.65 % | 8.62 % | 49.07 % | | 3.06 % | 0.11 % | | 2.75 % | |
| Female | 44.80 % | 32.94 % | 6.78 % | 39.60 % | | 2.86 % | 0.09 % | | 2.14 % | |
| Urban | 40.94 % | 26.82 % | 7.91 % | 34.56 % | | 4.07 % | 0.15 % | | 1.99 % | |
| Rural | 56.76 % | 44.94 % | 7.26 % | 52.06 % | | 1.82 % | 0.04 % | | 2.71 % | |
| Nomad | 2.30 % | 1.84 % | 0.24 % | 2.07 % | | 0.04 % | 0.00 % | | 0.19 % | |

Source: Own calculation based on Sudan Central Bureau of Statistics Population Census Data (2010): The Fifth Sudan Population and Housing Census (2008)
Below secondary includes: intermediate, primary and below primary includes below primary, without educational Attainment, and Khalwa, secondary and less than university includes secondary and post Secondary/Diploma Program, university includes university and colleges, higher than university includes post graduate diploma, Master and Ph.D. degree

**Table 2.11** The brain drain: Sudanese working abroad with legal contracts, classified by occupation over the period (2005–2008)

| | Total | | | | | Share in total (%) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2005 | 2006 | 2007 | 2008 | 2005–2008 | 2005 | 2006 | 2007 | 2008 | 2005–2008 |
| Total | 8,447 | 8,302 | 13,854 | 22,144 | 52,747 | 100 % | 100 % | 100 % | 100 % | 100.00 % |
| White collar high | 496 | 782 | 1,068 | 2,177 | 4,523 | 5.87 % | 9.42 % | 7.71 % | 9.83 % | 8.57 % |
| White collar low | 573 | 300 | 1,426 | 2,481 | 4,780 | 6.78 % | 3.61 % | 10.29 % | 11.20 % | 9.06 % |
| White collar | 1,069 | 1,082 | 2,494 | 1,363 | 6,008 | 12.66 % | 13.03 % | 18.00 % | 6.16 % | 11.39 % |
| Blue collar high | 5,878 | 4,810 | 6,838 | 14,416 | 31,942 | 69.59 % | 57.94 % | 49.36 % | 65.10 % | 60.56 % |
| Blue collar low | 1,500 | 2,410 | 4,522 | 15,652 | 24,084 | 17.76 % | 29.03 % | 32.64 % | 70.68 % | 45.66 % |
| Blue collar | 7,378 | 7,220 | 11,360 | 18,192 | 44,150 | 87.34 % | 86.97 % | 82.00 % | 82.15 % | 83.70 % |

Source: Sudan Ministry of Labour and Public Service – Annual Economic Reports (various issues)

majority of foreign workers were employed in highly skilled jobs and competed with Sudanese on the available job opportunities in Sudan. Notably, the share of white collar high foreign workers increased from 61 % to 80 %, 89 % and 88 % in 2002, 2003, 2005 and 2006 respectively, and the share of white collar foreign workers increased from 77 % to 90 %, 96 % and 91 % in 2002, 2003, 2005 and 2006 respectively (see Table 2.12 below). The shortage of skilled workers, notably technical skill and mismatch problems in technical jobs also increased the demand for foreign technical workers and this may also contribute to reduce the employment opportunity and therefore increase the unemployment rates for Sudanese workers (see Table 2.13 below).

### *2.4.3 The Unemployment, Youth Unemployment and Skill Mismatch at the Macro Level in Sudan*

One stylised fact in the labour market in Sudan is the incidence of a chronically serious unemployment crisis (see Table 2.2 above). Sudan like many other Arab countries not only faces many challenges such as low per capita GDP, low growth of labour productivity and the incidence of a high poverty rate, but also the persistence of a high and rising unemployment rate. This persistent unemployment problem may reflect both a general problem of growth and development and a structural problem of the labour market and inequality, and may lead to several serious implications in hindering the process of development and economic growth. The discussion of unemployment in Sudan is important because of higher and persistent rates of unemployment – now in excess of 20 % (see Table 2.2 above and Fig. 2.15 below). Several studies in the Sudanese literature (cf. Ministry of Labour Report 2004–2005) indicate the problem is due to the demand side, but it is also essential to reflect on the interaction between the supply and demand sides and examine the problem from both perspectives. The UNDP report (2006: 92–94) shows the broad employment trends in Sudan during the 1990s and illustrates a process of jobless growth over that period and highlights the need for employment creation or generation and poverty alleviation in Sudan. Different from the several studies in the Sudanese literature, we explain below four stylised facts on the unemployment problem in Sudan, including the presence of several types of unemployment; the interpretation of unemployment crisis in Sudan from two different endogenous and exogenous perspectives due to endogenous and exogenous causes; the high incidence of unemployment among youth population; and the large mismatch between educational qualifications – supply – and labour market requirements – demand. One advantage of our analysis is that we explain these stylised facts using new data on unemployment based on Sudan Central Bureau of Statistics (2010) population census (2008).

The first stylised fact on the incidence of unemployment in Sudan is the prevalence of several different kinds or types of unemployment including structural, voluntary, involuntary, seasonal, frictional, cyclical, technological, youth, disguised,

**Table 2.12** Distribution of foreign workers by occupational classification (%) in Sudan (2002–2006)

| Distribution of foreign workers by occupational classification | 2002 | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|
| Total | 100 % | 100 % | 100 % | 100 % | 100 % |
| White collar high | 61 % | 80 % | 84 % | 89 % | 88 % |
| White collar low | 16 % | 11 % | 12 % | 7 % | 3 % |
| White collar | 77 % | 90 % | 96 % | 96 % | 91 % |
| Blue collar high | 0 % | 7 % | 0 % | 4 % | 1 % |
| Blue collar low | 23 % | 3 % | 4 % | 0 % | 8 % |
| Blue collar | 23 % | 10 % | 4 % | 4 % | 9 % |

Source: Adapted from the Statistics of Ministry of Labour

**Table 2.13** The share of technician labour in the field of mechanical engineering compared to non-technician and foreign labour

| | Technical job/ total job | Non technical work in technical job% | Foreigner in technical jobs% |
|---|---|---|---|
| Cars | 59 | 21.7 | 19.3 |
| Heat capacity | 93.5 | 6.5 | |
| Heavy machines | 86.8 | 13.2 | ... |
| Refrigeration, cooling and conditioning | 70.7 | 25.9 | 3.4 |
| Welding and blacksmith | 53.5 | 29.3 | 17.2 |
| Foundries and metal | 50.0 | 50 | .... |
| Machining formation | 64.1 | 33.3 | 2.6 |
| Maintenance of pumps | 33.3 | 66.3 | .... |
| Compilation of cooking machine | 66.7 | 33.3 | ... |
| Food processing machine | 38.5 | 53.8 | 7.7 |
| Mineral formation | 42.9 | 28.6 | 82.6 |
| Electrical steam generators | ... | 100 | ... |

Source: Prof. Alsheikh Almagzoub (2008) "study of the need in labour market for technician" cited in Sharaf Eldein Ahmed Mohamed (February 2007, 2008) "Globalization and requirements for improving the quality and efficiency of technical education output," paper presented at the third conference for the manager and experts of technical education in states, ministry of education, general department of technical education, June 2008, Table 4, p. 12.

hidden, temporary and open chronic unemployment in Sudan. The presence of seasonal unemployment in Sudan can be perceived from the fact the majority of Sudanese labour force is still hired in the agricultural sector, which is characterised by relative availability of seasonal work in agriculture. In addition the high intensity of labour and family workers in the agriculture sector has probably also caused disguised and hidden unemployment in Sudan. Furthermore, the presence of hidden and disguised unemployment can be perceived from the fact that the public sector is still the main source of job creation in Sudan, it has a limited capacity to hire more workers but the commitment of the government to hire beyond the capacity of the public sector has caused low productivity of workers – at least compared to other Arab countries (see Arab Labour Organization 2007). Furthermore, the presence of frictional unemployment can be perceived from the geographical (temporary)

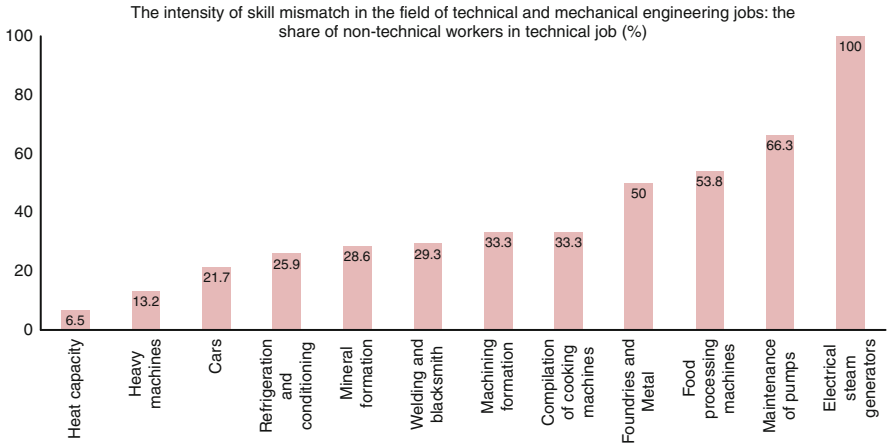


**Fig. 2.15** The intensity of skills mismatch in the technical and mechanical engineering jobs: the share of non-technical workers in technical job (%) (Source: Adapted from Almagzoub (2008) and Mohamed (February 2007, 2008))

movement of people (displaced workers and internal refuges). Moreover, the presence of cyclical unemployment can be perceived from the economic crises over the past decades in Sudan. In addition, the presence of technological unemployment can be perceived from the recent expansion in the use of technology, especially ICT in the services, notably the banking sector in Sudan. We observe that the use of new technologies in the banking sector caused displacement and substitution of workers, and contributed to a reduction in the number of employment opportunities. For instance, according to the results of the survey presented in the Central Bank of Sudan (2004) aimed at assessing the impacts of the use of new technologies in Sudanese banking system in 2004, 56.5 % of the respondents indicate that the use of new technologies in the banking system has had some impacts on employment and resulted in the reduction of the number of workers and hence led to an increase in unemployment in Sudan.[47] Furthermore, the presence of youth unemployment can be perceived from the recent information that indicates the rapid increase in unemployment rate in Sudan, especially the youth unemployment rate that reached around 18 % of the total youth population in Sudan; youth unemployment also increased amongst university graduates. In addition, the presence of involuntary unemployment can be perceived from the presence of high unemployment among youth and university graduates, which can be interpreted partly as compulsory unemployment and partly also structural unemployment. The presence of voluntary unemployment can be perceived from the low participation rate, especially for women (housewives). Furthermore, structural unemployment either temporary or open chronically has been persistently present for a long time and can be perceived from the consequences of

[47] See the Central Bank of Sudan (2004), p. 36.

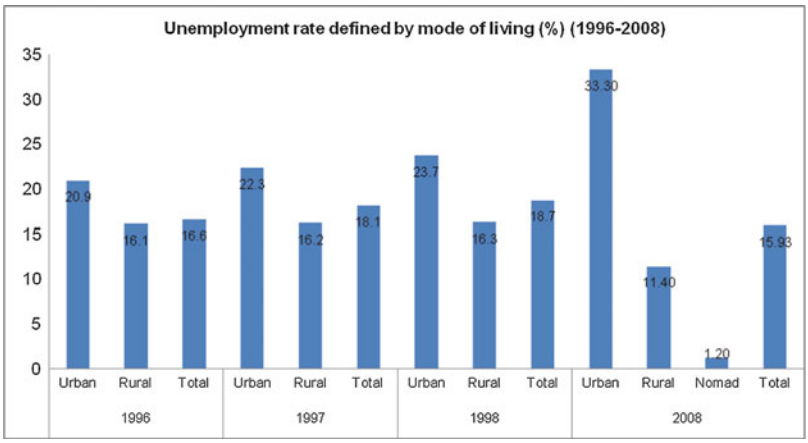


**Fig. 2.16** Total unemployment rates in Sudan (%) defined by mode of living (1996–2008) (Sources: (1) Figures for 1996 obtained from Central Bureau of Statistics – Migration and Labour Force Survey 1996. (2) Central Bureau of Statistics – Department of Internal Commerce and Pricing. (3) Figures for 1997/1998 from Ministry of Finance and National Economy – Annual Economic Survey 2000, Table 7-2, p. 10. (4) Figures for 2008 obtained from own calculation based on Sudan Central Bureau of Statistics Population Census Data (2010): The Fifth Sudan Population and Housing Census 2008)

the structural reform and the mismatch between educational qualifications for youth and requirements in the labour market. Moreover, the presence of persistent open chronically long-term unemployment is perceived from the fact that the problem of unemployment existed throughout much of the period 1973–2011. For instance, in Sudan, the rate of unemployment has rapidly increased since 1973 and has more than doubled over the past 15 years (over the period 1993–2008); for instance, the rate of unemployment increased from 10.3 % in 1993 to 20.7 % in 2008, which implies that the unemployment problem remains a chronically persistent one in Sudan (see Table 2.2 above and Fig. 2.16 above).

The second stylised fact is the interpretation of the unemployment crisis in Sudan from two different endogenous and exogenous perspectives due to exogenous and endogenous causes. The exogenous causes include the implications of the internal refuges and migration due to environmental problems, drought and desertification, civil war and conflict, influx of refugees from other neighbouring countries, imbalanced development strategies, globalisation and the use of foreign workers. The exogenous causes also include other factors, for instance, the drop in world oil prices in the 1980s, the Gulf War in the early 1990s and the recent increasing move towards nationalisation of jobs in the Arab Gulf countries, together caused the Arab Gulf states to cut back drastically on their expatriate workers, which resulted in the departure of the thousands of Sudanese workers based in these countries, leaving many of their possessions behind, and leading in turn to increased unemployment in Sudan. Unemployment is also caused by the exogenous environmental problems, for instance, unemployment figures were affected by the severe

drought that spread throughout Sudan in the 1980s. In 1983–1984, for example, several million people migrated from the worst hit areas in both the west and the east to Khartoum and other urban areas along the Nile. Many remained in these areas once the drought had eased, living in shantytowns and contributing to unemployment or underemployment in the cities. In addition, more than one million people from the south migrated to the north, as a result of the civil war and famine in these areas. We observe that the lack of political stability and the north–south conflict also contributes to increase unemployment because the civil war not only led to the displacement of many workers and job losses, but also necessitated significant expenditure on defence and security issues rather than prioritising investment in social development and the creation of more employment opportunities. The endogenous causes include the deficient demand caused by deficient macroeconomic policies: privatization; a deficient public sector, a deficient private sector, structural reform, mismatch between educational output and labour market need, unemployment caused by labour market policies, educational policies, and the use of new technologies. In particular, the considerable reduction in the aggregate demand and demand for labour was caused by the liberalisation, structural adjustment programs and privatisation of state owned enterprises during the 1990s that contributed to increased unemployment of the labour force (see Dagdeviren and Mahran 2004). Moreover, the deficiency and low employment of the private sector also contributed to unemployment in Sudan (see Ministry of Labour Report 2004–2005). In addition, we find that the inflation rate is one of the very important endogenous factors that affected the unemployment problem though it does not receive adequate analysis in the Sudanese literature. For this reason, our analysis in this chapter fills this gap in the Sudanese literature and discusses the correlation between inflation rates and unemployment rates. For instance, our findings imply that the increase in unemployment rates seems to be correlated with the increase in inflation rates in Sudan in the period 2000–2008. For instance, when using data and figures on unemployment rates and inflation rates over the period 1990–2008 (presented in Table 2.2 above) and using the ordinary least squares method to examine the correlation between inflation and unemployment rates in Sudan, we find positive and significant correlation between the unemployment rate and inflation rate for the case of Sudan for the period 2000–2008. We find negative significant correlation between inflation rate and unemployment rate over the period 1990–2008, and negative insignificant correlation between inflation rate and unemployment rate over the period 1990–2000. Our findings on the negative correlation between inflation rate and unemployment for the periods 1990–2008 and 1990–2000 are consistent with the studies in the literature in support of the Phillips curve.[48] But our result on the positive correlation between inflation rate and unemployment for the period 2000–2008 is opposite to the findings for the periods 1990–2008 and 1990–2000 and is different from the findings in support of Phillips curve. These contrasting findings for the periods 1990–2000 and 2000–2008 imply

[48] Phillips curve firstly used by Phillips (1958); it indicates a negative correlation between inflation rates and unemployment rates.

**Table 2.14** Correlation between unemployment and inflation rates in the Sudan (1990–2008)

| Year | SPSS | | | E-VIEWS | | |
|---|---|---|---|---|---|---|
| | Coefficient (*t*-value) | N | $R^2$ | Coefficient (*t*-value) | N | $R^2$ |
| 1990–2008 | −0.024* (−2.192) | 16 | 0.256 | −0.024* (−2.192) | 16 | 0.256 |
| 1990–2000 | −0.015 (−1.119) | 8 | 0.173 | −0.015 (−1.1197) | 8 | 0.173 |
| 2000–2008 | 0.567* (2.857) | 9 | 0.538 | 0.567* (2.857) | 9 | 0.538 |

**Correlation is significant at the 0.5 level of significance

that the correlation between inflation rates and unemployment turned from a negative into a positive correlation in Sudan (see Table 2.14 above and Fig. 2.17 below). The major policy implication from our findings on a significant positive correlation between inflation and unemployment rates for the case of Sudan for the period 2000–2008, implies that an increase in inflation rates have caused an increase in unemployment rates over the period 2000–2008, and so macroeconomic policies aimed at or targeting reducing inflation rates would also contribute to reduce unemployment rates (see Table 2.14 above).

The third stylised fact on the incidence of unemployment in Sudan is the high unemployment among the youth population (see Fig. 2.19 below). Sudan like many other typically developing countries not only suffers from high annual population growth rate (2.8 %) and a very high rate of unemployment (20.7 %), but also the population structure in Sudan as in many other Arab countries – with a high percentage of young people – makes the situation of unemployment even worse and more difficult as most of the population is under 25 years of age; this category of young people represents 22.9 % of Sudan's total population in 2006. Such a population structure has prompted the need to create more job opportunities and is anticipated to put more pressure on the future demands for jobs in Sudan. This situation has led to a very high rate of unemployment among the youth population, for example, according to Arab Labour Organization (2007) data for 2004, the rate of youth unemployment among Sudanese youth is 41.25 %, among females is 43.25 % and males is 36.64 %. The estimated unemployment among Sudanese youth (41.25 %) is among the highest in the world: 2.9 % as much as the international world rate, 2.6 % as much as in Latin America and the Pacific, 2.5 % as much as in South East Asia and 1.4 % as much as in the Arab world (see also Arab Labour Organization (2007); and see Fig. 2.18 below). This situation has ranked Sudan as the fifth worst after Algeria, Iraq, Mauritania and Somalia amongst the Arab countries.[49]

This situation has not only resulted in unemployment but also caused a state of mismatch and underemployment in Sudan as some people were forced to take up jobs for low compensation packages that do not suit their qualifications. (cf. Ministry of Labour Report 2004–2005).[50] The above findings on the high rate of

[49] See for example Arab Labor Organization (2007) and International Labor Organization (2007) recent statistics for 2006.

[50] In this paper the terms Ministry of Labour, Ministry of Labour and Public Service, Ministry of Labour and Administrative Reform are used interchangeably to refer to Ministry of Labour, because the Ministry of Labour is named differently in different regimes.

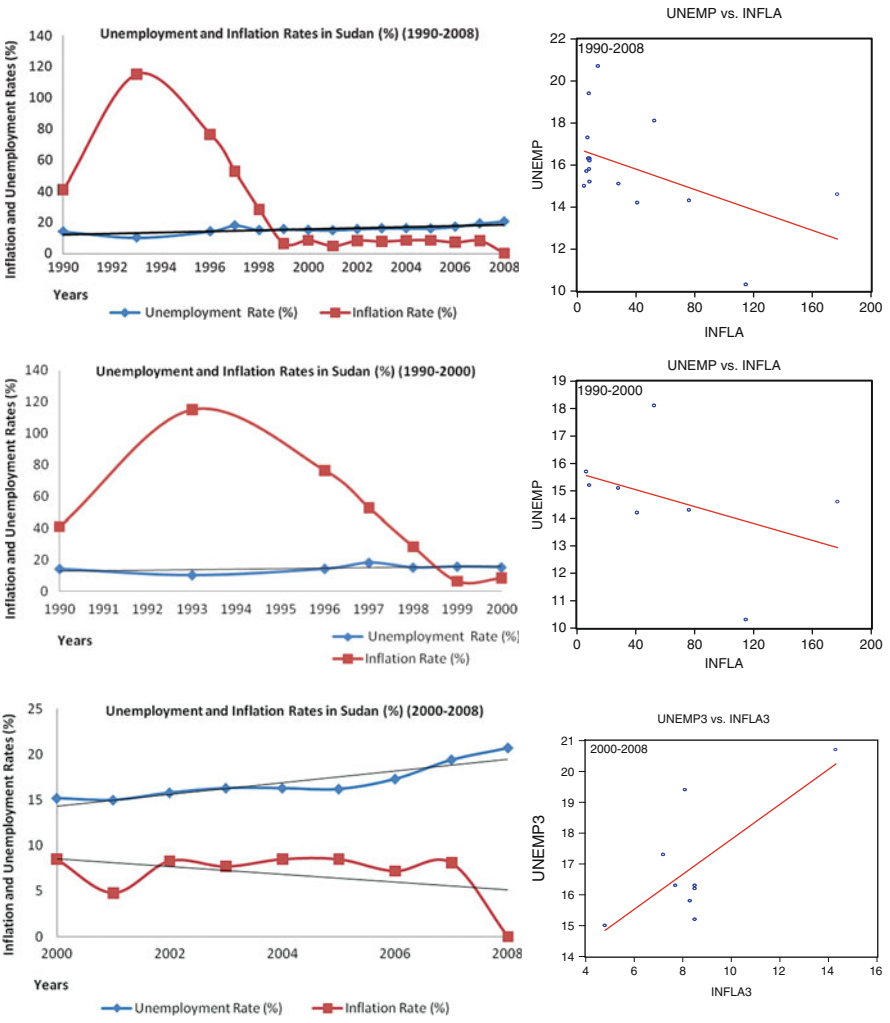


**Fig. 2.17** The relation between unemployment and inflation and rates in Sudan (%) (1990–2008) (Source: Own calculation based on data obtained from (1) the Central Bank of Sudan, (2) the central bureau of statistics, (3) Ministry of Finance and National Economy, and (4) Ministry of Labour and public service Annual Economic Reports (various issues))

unemployment for the youth population is also consistent with the findings based on Sudan census data for 1993 and Ministry of Labour and Public Service Migration and Labour Force Surveys 1993 and 1996 that show the presence of persistent unemployment crisis in Sudan and the rising trend since 1979 amongst total population of men and women in rural and urban areas. As for the incidence of unemployment according to age groups in 1996, one should realise that for the total population the highest rate of unemployment is reported amongst the youth


**Fig. 2.18** Youth unemployment rates (%) in Sudan compared to world regions (15–24) (2004) (Source: Arab Labor Organization 2007)

population aged 15–24, estimated at 28.4 %, followed by those aged 15 years and over (15.1 %), those aged 25–54 (12.1 %), those aged over 64 (11.4 %), and those aged 55–64 (10.3 %). Therefore, data for 1996 implies that the incidence of open unemployment according to age and gender was higher among the youth population, and notably, young women were more likely to be unemployed compared to young men. Youth unemployment increased from 28.4 % in 1996 to 29 % and 30.8 % in 1997 and 1998 respectively. The distribution of unemployment according to education level indicates that for total population, unemployment is high for primary education (33.8 %), followed by illiterate (29.9 %), illiterate/basic (21.6 %), secondary (11.2 %) and above secondary (3.5 %). The unemployment rate according to education level indicates that for all youth, total unemployment (28.3 %) is high for above secondary (48.7 %), followed by secondary (35.6 %), primary (34.6 %), illiterate/basic (25.59 %) and illiterate (23.4 %). Our findings based on Sudan Central Bureau of Statistics (2010) population census data for 2008, implies that the structure and distribution of the total population and labour force defined by age, gender, mode of living and education attainment have several important implications in the employment rates and unemployment rates. Notably, we find that for the total labour force, employment rates and unemployment rates for men are higher than women and for rural are higher than urban. Moreover, we find that the distribution of unemployment by age groups indicates that the highest unemployment is for the age group 15–24 (32.80 %), followed by the age group 25–39 (32.44 %), age group 10–14 (13.80 %), age group 40–59 (14.57 %) and finally age group 60 and over (4.37 %). These findings are consistent with the findings from the 1993 population census and 1996 migration and labour force survey. These findings are also consistent with the structure and distribution of population in Sudan in 2008 as defined by gender and mode of living as we explain above. Moreover, we find that for the economically active population both employment and unemployment rates

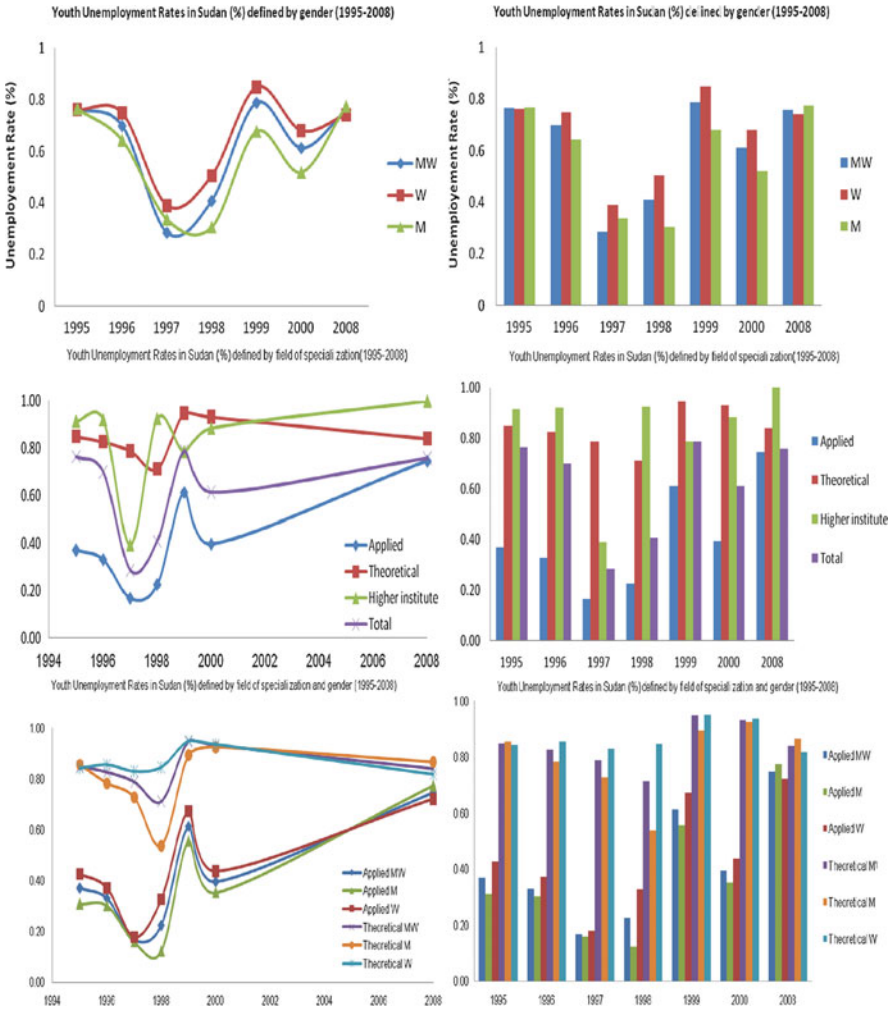


**Fig. 2.19** Youth unemployment rates in Sudan (%) defined by gender (1995–2008) (Source: Own calculations based on data from the Sudan federal public service recruitment board – Statistics and Research Administration)

are higher for primary education, followed by secondary and post secondary education respectively. Furthermore, we find that for the economically inactive population the expectations of no hope to find a job (or the potential unemployment) are higher for primary education, followed by secondary and post secondary education respectively (see Table 2.15 below). These findings together imply the importance of education in reducing the incidence of unemployment.

The fourth stylised fact on the incidence on unemployment in Sudan is that the persistence of unemployment (especially among youth) is not only high but also shows a tendency to increase over time in Sudan which is most probably related to the large mismatch between educational qualifications – supply – and labour market requirements – demand – which is perceived from the observed structural change in the demand or changing trends in the share of employment over the period 1988/1989–2008. In particular, on average demand or priority in employment was concentrated among higher secondary school graduates over the period 1988/1989–1996, but the trend changed, and on average priorities in employment turned to become concentrated in applied science colleges followed by social science and art colleges and finally higher institute diploma over the period 2001–2008. This can be attributed to changing trends and priorities from hiring higher secondary school graduates to hiring university graduates, especially applied science college graduates, due to changes in higher educational policies; in particular, the higher education revolution led to expansion in higher educational institutions and increase in student enrolment and graduation during and after the 1990s. This can be interpreted as structural change in the demand for youth labour in favour of university graduates due to structural change in higher educational policies. We observe the changing trend and priorities in reducing employment for higher secondary school graduates to increasing employment for university graduates. However, the structural change in the demand for youth labour in favour of increasing employment for university graduates should not hide the fact that unemployment among university graduates is surprisingly high and continue to increase. Somewhat surprisingly the unemployment crisis was persistent especially among all youth graduates – female and male – in different field of specialisations, even among graduates of applied science colleges. The majority of employment was for graduates in applied science colleges, followed by graduates in social science and art colleges and finally the minority for graduates of higher institute diploma. In general, men were likely to be more employed than women and women were likely to be more unemployed than men.

This fourth stylised fact implies the large mismatch between educational qualifications – supply – and labour market requirement – demand. An important endogenous cause of youth unemployment is the mismatch between educational (qualifications-output) and labour market requirements. Deficiency in educational policies and labour market policies and inadequate planning, assessments and monitoring of policies to create consistency between attained and required education has led to a serious mismatch between educational attainment and labour market requirements. To elaborate the mismatch and unemployment amongst university graduates we utilise the figures on registration and employment obtained from the federal public service recruitment board; we use the figures on registration to refer to supply of university graduates labour; and use the figures on employment to refer to demand for university graduates labour; we calculate the differences between registration and employment to refer to the differences between supply of and demand for university graduates and to define unemployment; then we divide the figures on unemployment by the figures on

**Table 2.15** Total population, labour force, economically active population, economically inactive population, employment and unemployment for population 10 years and above defined by age, gender, mode of living, main geographical areas and educational attainment in Sudan (2008)

| | Total population (%) | Total labour force (%) | Total economically Active (%) | Total employed (%) | Total unemployed (%) | Total unemployed (%) | Total economically inactive (%) | REASON_REC | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | No hope to find job (%) | Full time student (%) |
| All Sudan: age groups | | | | | | | | | |
| All Sudan | 100.00 | 100.00 | 43.68 | 84.07 | 15.93 | 100 | 48.80 | 10.28 | 40.70 |
| 10–14 | 18.58 | 18.58 | 4.19 | 7.08 | 2.52 | 15.81 | 13.18 | 2.78 | 21.03 |
| 15–24 | 27.98 | 27.98 | 9.95 | 17.56 | 5.23 | 32.80 | 15.89 | 3.50 | 18.02 |
| 25–39 | 28.56 | 28.56 | 15.98 | 31.42 | 5.17 | 32.44 | 10.13 | 2.36 | 1.70 |
| 40–59 | 17.48 | 17.48 | 10.60 | 21.93 | 2.32 | 14.57 | 5.69 | 1.74 | 0.14 |
| 60 and over | 7.40 | 7.40 | 2.96 | 6.07 | 0.70 | 4.37 | 3.92 | 0.33 | 0.01 |
| All Sudan: educational attainment | | | | | | | | | |
| No qualifications | 4.81 | | 6.08 | 6.13 | 5.18 | 5.18 | 1.99 | 0.52 | 0.77 |
| Primary/junior | 11.65 | | 10.89 | 10.99 | 9.08 | 9.08 | 6.39 | 0.57 | 7.20 |
| Secondary | 7.61 | | 7.77 | 7.88 | 5.76 | 5.76 | 3.70 | 0.37 | 4.25 |
| Post secondary | 3.80 | | 5.32 | 5.39 | 4.10 | 4.10 | 0.96 | 0.18 | 0.91 |
| Khalwa | 3.45 | | 4.36 | 4.32 | 5.09 | 5.09 | 1.34 | 0.41 | 0.64 |
| Not stated | 73.48 | | 71.66 | 71.42 | 75.97 | 75.97 | 36.41 | 8.76 | 27.71 |
| All Sudan | | | | | | | | | |
| Total | 100.00 | 100.00 | 43.68 | 84.07 | 15.93 | 100 | 48.80 | 10.28 | 40.70 |
| Male | 50.07 | 50.07 | 28.99 | 57.23 | 9.14 | 57.33 | 17.28 | 5.57 | 22.44 |
| Female | 49.93 | 49.93 | 14.69 | 26.84 | 6.80 | 42.67 | 31.52 | 4.71 | 18.26 |
| Urban | 31.49 | 31.49 | 11.83 | 23.74 | 3.33 | 20.93 | 16.72 | 2.18 | 17.69 |
| Rural | 61.48 | 61.48 | 28.47 | 53.78 | 11.40 | 71.57 | 29.21 | 7.24 | 22.16 |
| Nomad | 7.03 | 7.03 | 3.38 | 6.54 | 1.20 | 7.51 | 2.87 | 0.86 | 0.85 |
| North | | | | | | | | | |
| Total | 80.58 | 80.58 | 30.10 | 57.32 | 11.59 | 72.73 | 43.16 | 6.91 | 37.07 |

(continued)

**Table 2.15** (continued)

| | Total population (%) | Total labour force (%) | Total economically Active (%) | Total employed (%) | Total unemployed (%) | Total unemployed (%) | Total economically inactive (%) | REASON_REC | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | No hope to find job (%) | Full time student (%) |
| Male | 40.41 | 40.41 | 22.14 | 43.60 | 7.08 | 44.41 | 14.64 | 3.69 | 20.20 |
| Female | 40.17 | 40.17 | 7.96 | 13.71 | 4.51 | 28.31 | 28.52 | 3.22 | 16.86 |
| Urban | 28.02 | 28.02 | 9.71 | 19.54 | 2.68 | 16.83 | 15.48 | 1.58 | 16.56 |
| Rural | 45.53 | 45.53 | 17.01 | 31.23 | 7.71 | 48.40 | 24.81 | 4.46 | 19.66 |
| Nomad | 7.03 | 7.03 | 3.38 | 6.54 | 1.20 | 7.51 | 2.87 | 0.86 | 0.85 |

Source: Own calculation based on Sudan Central Bureau of Statistics Population Census Data (2010): The Fifth Sudan Population and Housing Census (2008)

registration to calculate the unemployment rates for university graduates.[51] We find that unemployment amongst university graduates in all subjects or fields of specialisations is persistent and high for more than two decades over the period 1984/1985–2008. In particular, persistent and high unemployment rates were mostly amongst theoretical, social science and art colleges graduates and technical education high institute (diploma) graduates. The majority of employed graduates were applied science colleges graduates, but this should not hide the fact that unemployment among this category is surprisingly also very high. This implies a mismatch between attained education (educational policies) and required education in the labour market (labour market policies) (see Fig. 2.19 above). We find that the high unemployment is persistent amongst the university graduates with different fields of specialisations over the period 1984/1985–2008, for example, on average the rates of unemployment for all fields of specialization were estimated at: 73 % (1984/1985), 82 % (1985/1986), 78 % (1986/1987), 81 % (1987/1988), 76 % (1995), 69 % (1996), 28 % (1997), 41 % (1998), 78 % (1999), 61 % (2000) and 76 % (2008) respectively. In particular, for applied science colleges unemployment was estimated at: 64 % (1984/1985), 85 % (1985/1986), 75 % (1986/1987), 48 % (1987/1988), 40 % (2000) and 75 % (2008) respectively. As for social science and art colleges, unemployment was estimated at: 88 % (1984/1985), 66 % (1985/1986), 76 % (1986/1987), 90 % (1987/1988), 82 % (1990/1991), 93 % (2000) and 84 % (2008) respectively. As for higher institute diploma, unemployment was estimated at: 74 % (1984/1985), 93 % (1985/1986), 84 % (1986/1987), 75 % (1987/1988), 49 % (1990/1991) and 88 % (2000) respectively.

Over the period 2000–2008, total unemployment for graduates of all fields of specialisation for total, women and men respectively increased from (61.2 %, 68.1 %, 51.9 %) in 2000 to (75.7 %, 74.2 %, 77.5 %) in 2008; unemployment for graduates of applied science colleges and fields of specialisation increased from (39.6 %, 43.7 %, 35.3 %) in 2000 to (74.6 %, 72.1 %, 77.4 %) in 2008; unemployment for graduates of art and social sciences colleges and fields of specialisation decreased from (93.1 %, 93.6 %, 92.4 %) in 2000 to (84 %, 81.7 %, 86.6 %) in 2008; and unemployment for graduates of high institutes (diploma) increased from (88.4 %, 93 %, 82 %) in 2000 to (100 %, 100 %, 100 %) in 2008. Over the period 1995–2000 the distribution of unemployment by gender implies that for all fields of specialisations, applied science colleges and social sciences colleges and fields of specialisation, women are more likely to be unemployed than men. Whereas somewhat surprisingly, the opposite is true in 2008 as the distribution of unemployment by gender implies that for all fields of specialisation, applied science colleges and social sciences colleges and fields of specialisation, men are more likely to be unemployed than women (see Figs. 2.14, 2.15, 2.16, 2.17, 2.18 and 2.19). Therefore, these findings provide further evidence on the serious and

[51] One limitation is that the use of figures on registration and employment to refer to supply of and demand for university graduates labor respectively may be somewhat inaccurate and underestimate the actual figures on supply of and demand for university graduates, because not all university graduates looking for jobs are registered for the federal public service recruitment board and also because figures on employment may include university graduates unregistered for the federal public service recruitment board.

increasing trend of youth unemployment, notably unemployment of university, college and higher institute diploma in Sudan over the period 2000–2008. This implies the urgent need for implementation of sound policies to address the unemployment problem and increase employment opportunities in Sudan.[52]

## 2.5 Overview on the Recent Restructuring and Challenges for Development in Sudan

The current Sudanese restructuring following the secession of South Sudan has serious implications for development and implies that the challenges are mounting for the economy and technological change in Sudan. From political perspective, the secession of South Sudan has led to political shock, uncertainty and potential future conflict over oil and border regions, particularly because the boundary is not completely delineated. From Northern Sudan's perspective, the demographic and geographical implications of South Sudan separation from North Sudan implies that North Sudan has lost about 21 % of Sudan's population and about 25–30 % of Sudan's area (see Sudan's Central Bureau of Statistics). From Northern Sudan's perspective, the economic implications of South Sudan separation from North Sudan implies that North Sudan has lost about 80 % of Sudan's agricultural and water resources, in addition to the loss of about 75 % of Sudan's proven oil reserves and about 90 % of Sudan's oil and total exports and about 50 % of Sudan's government revenues (see Sudan Central Bureau of Statistics, Central Bank of Sudan and Sudan Ministry of Finance and National Economy). Mainly, the split of the South Sudan means that the North Sudan has lost most of its oil reserves, lost near to two thirds of the country's total oil production of 500,000 barrels a day; this implies the loss of the main source of State revenues. The declining State revenues together with the increasing State expenditure led to a growing budget deficit. Other economic implications are the scarcity of foreign currency, devaluation and loss of near to half value of the Sudanese pound in 1 year that has led to fast rise in prices and near to doubled annual inflation rate that hit almost 28.6 % in April 2012 compared to 16.5 % in April 2011, this implies that the inflation rate is near to doubled during 1 year over the period April 2011 and April 2012 (see Fig. 2.20) (see Sudan central bureau of statistics).[53] Moreover, the political and economic shock implies the lack of political and economic stability, increasing uncertainty for Sudan economy, increasing domestic and external imbalances, difficulties of sustaining macroeconomic stability, limitation on capital inflow and foreign investment and increasing the amount of external debt. The secession of South Sudan resulted in 80 % decline in foreign currency earnings and a 35.6 % reduction in budget revenue. Real GDP grew by 2.8 % in 2011, down from 5 % in 2010. This

[52] See Sudan Federal Public Service Recruitment Board – Statistics and Research Administration (2010).

[53] See http://www.cbs.gov.sd/sites/default/files/Publications/April%20Bulletin.pdf: p. 7, accessed June 03, 2012.

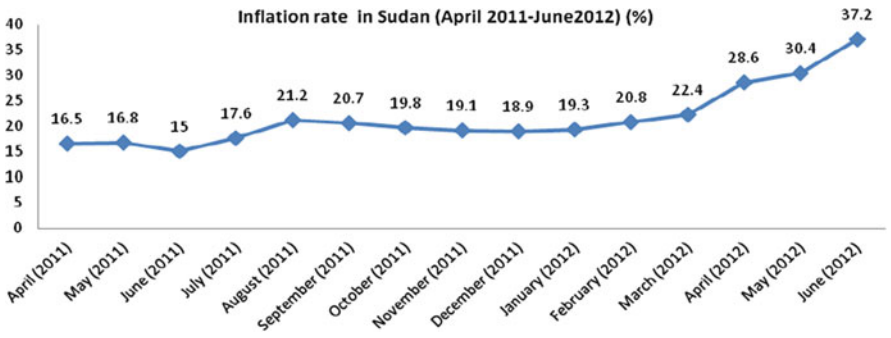


**Fig. 2.20** Inflation rates in Sudan (%) (April 2011–April 2012) (Source: Sudan Central Bureau of Statistics (2012): http://www.cbs.gov.sd/sites/default/files/Publications/April%20Bulletin.pdf: p. 7, Accessed June 3, 2012)

slowdown in growth is attributable to the loss of population and oil revenues and GDP growth is estimated to decline further to 2 % in 2012.[54] Deterioration in overall balance of payment, as the balance of payment deficit increased by more than 17 times from US$ 54.2 millions in 2010 to US$ 922.4 millions in 2011.[55] This implies that the economic situation in 2012 had not improved from 2011, and the current economic crisis implies further pressure on the already limited government budget and efforts to allocate more resources for enhancing skill development and local technological capacity building. This implies the importance of implementing sound policies to stabilize Sudan economy and allocate more resources for enhancing skill development and local technological capacity building.

## 2.6 Conclusions

This chapter explains the general political context and socioeconomic characteristics of Sudan and strategic problems for development in the country, and discusses the impact of oil and the opportunities and challenges for enhancing economic development in Sudan, as well as discussing the strategic problems facing the labour market in Sudan and highlighting the need for skill upgrading and development.

In Sect. 2.2 we started by explaining the general socio-economic characteristics of Sudan's economy. In Sect. 2.3 we then provided a comprehensive analysis using the most recent secondary data, with a view to clarifying the positive and negative effects of oil on Sudan's economic development. We have provided a historical background about the structure of oil investment in Sudan, looking in particular at China's role therein, and explained how oil has created various positive effects and opportunities for development in Sudan. These include the impact of oil in satisfying

[54] See www.africaneconomicoutlook.org/countries/east-africa/sudan/, accessed June 03, 2012.

[55] See the Economic Review June 2012 – Statistical Department – Central Bank of Sudan – Issue No. 06/2012, p. 3.

domestic demand and achievement of self-sufficiency, increasing government resources, revenues and spending, economic growth (GDP growth and composition), foreign trade (volume and structure of exports), balance of trade, balance of payment, FDI and social development in Sudan. We then illustrated the negative impact of oil and the challenges of development in Sudan. These include the volatility and risk of dependence on highly fluctuating oil prices in the international market, unsustainable oil revenues, the lack of diversification, Dutch Disease and the challenges of potential future Sudan-Southern Sudan conflict. Our results in Sect. 2.2 support the stylised fact that oil has had a mixed positive–negative impact on Sudanese economy, arguing that oil is an important resource, particularly in satisfying domestic consumption and the achievement of self-sufficiency by increasing government and public revenues. Although oil has helped to improve economic performance in the country, we find that the recent dependence on oil may spark other problems because it is an exhaustible resource and because instability of oil prices in the international market tend to produce uncertainty in domestic growth. Moreover, the increasing dependence on oil raises the possibilities of the Dutch Disease phenomenon and a lack of diversification, which may aggravate challenges linked to the division of the country and the potential for conflict with newly independent Southern Sudan. Therefore the major policy implication from our findings is that the fulfilment of long run sustainable growth and development strategies in Sudan requires various sources of growth, including revitalising and enhancing non-oil exports, notably traditional agricultural exports.

In Sect. 2.4 we explain several stylised facts on the labour market. First we explain the relation between the structure of the labour market and the demographic structure, participation rates and economic activities. Second, we show the relation between the structure of labour market and the low skill level and brain drain problems and finally we examine the relation between the structure of the labour market and the unemployment and youth unemployment problems in Sudan. We show that the differences in the structure and distribution of the total population defined by age, gender and mode of living have several important implications in the structure of labour market; notably, we find that the labour force, participation rates, economic activities, skill level, employment rates and unemployment rates for men are higher than women, and for rural are higher than urban areas in Sudan.

Different from the several studies in the Sudanese literature we examine in detail four stylised facts on the unemployment problem in Sudan including the presence of several types of unemployment; the interpretation of unemployment crisis in Sudan from two different endogenous and exogenous perspectives due to endogenous and exogenous causes; the high incidence of unemployment among youth population and the large mismatch between educational qualifications – supply – and labour market requirement – demand. Moreover, one advantage of our analysis is that we explain these stylised facts using new data on population, employment and unemployment based on Sudan Central Bureau of Statistics (2010): Fifth Sudan Population and Housing Census 2008.

The major policy implication from our findings indicate that the unemployment crisis is related or linked to the endogenous and exogenous causes explained above, therefore reducing unemployment and enhancement of employment creation are

most probably related or linked to several important factors and so policies intervention should deal with these endogenous and exogenous reasons or causes. The solution to the unemployment problem in Sudan not only includes the role of the government and public sector, but also essential roles for the private sector and non-governmental organisations as well as civil society. This implies that the possible policy interventions for reducing unemployment and enhancing employment include increasing employment opportunities in the public and private sectors, improvement of work conditions, employment policies, regulations and legislations, improvement of the federal public recruitment board and improvement of the quality of educational policies to enhance the consistency between the educational attainments and educational requirements in the labour market. One major policy implication from our results implies that an increase in unemployment rates is positively and significantly correlated to an increase in inflation rates over the period 2000–2008, and so macroeconomic policies aimed at targeting reducing inflation rates would also contribute to reduce unemployment rates. Therefore, macroeconomic policies should be used to reduce inflation in order to reduce unemployment in Sudan. Other policies include: reducing the use of foreign workers and the influx of foreign refuges; reducing internal migration by avoiding civil war and conflict and solving political problems and achieving political stabilization; ensuring equity and fairness in the labour market; attracting foreign capital for the creation of new employment opportunities for domestic and local workers and upgrading skill levels; creating more job opportunities for the poor by enhancing small and medium scale enterprises and provide unemployment insurance; enhancing small and family projects; implementing balanced development strategies and improving work conditions and availability of infrastructure and offering incentives to encourage work in the remote states; and finally use of oil revenues to create more and new employment opportunities for domestic workers in Sudan. It is important to realise that the unemployment crisis cannot be managed in a sustainable way through increased employment in an already inflated public sector; productive employment must be generated mostly in the private sector. Dealing with the unemployment crisis and meeting the poverty alleviation challenge requires action in wide-ranging areas of structural reforms to improve the business environment, encourage private sector investment, stimulate productivity growth and enhance efficiency. The implementation of plans simultaneously targeting reducing unemployment and poverty, for instance, provision of more employment opportunities and poverty alleviation, are related to improving infrastructure and facilities of value to the whole society, using labour-intensive methods or schemes to generate employment for large numbers of poor people as well as mobilising small, informal enterprises where many of the poorest workers are concentrated. These strategies are expected to also lead to sustainable job creation and therefore poverty alleviation.

Our findings in this Chapter support our first hypothesis in Chap. 1 that Sudan needs to promote local skills and local technologies in order to implement the five strategies of reducing poverty; achieving economic diversification; reducing unemployment and restructuring the labour market; building local technological capacity and achieving long-term stabilised, sustainable and balanced economic growth and development.

## References

Almagzoub, A. (2007/2008, June). Study of the need in labour market for technician. In S. A. Mohamed (Ed.), *Economic globalization and requirements of improving the efficiency and outputs of technical and technological education*. Paper prepared for the Third Conference of Managers and Senior Directors of Technical Education in States. Khartoum: Ministry of Education, General Directorate of Technical Education. Table 4, p. 12.

Arab Labor Organization. (2007). *Statistics on labor market in the Arab region*. http://www.alolabor.org, Accessed 10 March 2009.

Barro, R. J., & Lee, J-W. (2010). A new data set of educational attainment in the World, 1950–2010. (NBER working paper no. 15902), National Bureau of Economic Research, Cambridge, , MA. http://www.nber.org/papers/w15902.pdf?new_window=1. April 2010.

Bedawi, W. F. (2007, July 14–31). *A brief look at Sudan's major economic trends and development challenges*. Paper presented at the Ministry of Finance and National Economy and the World Bank "Macroeconomic and Fiscal Federalism Workshop", Khartoum, Sudan.

Corden, W. M. (1984). Booming sector and Dutch disease economics: Survey and consolidation. *Oxford Economic Papers, 36*(3), 359–380.

Dagdevirena, H., & Ameer Mahran, H. A. (2004). Trade and industry in Sudan: What role for poverty alleviation. Final draft, UNDP project on macroeconomic policy and poverty alleviation in the Arab region. Khartoum: UNDP office in Sudan.

Elbadawi, I. A., & Kaltani, L. (2007, 14–31, July). *The macroeconomics of oil booms: Lessons for SSA, Development Economics Research Group, Economists' Forum, April 19, 2007*. Paper presented at the Ministry of Finance and National Economy and the World Bank "Macroeconomic and Fiscal Federalism Workshop", Khartoum.

Elbadawi, I., & Suleiman, K. (2008). Toward an equitable inter-governmental transfer system for the Sudan. Chapter 3. In S. Abd El Rhman (Ed.), *Generating growth and making fiscal decentralization work in post-conflict Sudan* (p. 107). Khartoum: Ministry of Finance and National Economy. Table 3.

International Monetary Fund (IMF). (2008, June). *Sudan*: *First review of performance under the 2007–08 staff-monitored program* (IMF Country Rep. No. 08/174). The Middle East and Central Asia Department, International Monetary Fund (pp. 2, 6). Washington, DC: http://www.imf.org/external/pubs/ft/scr/2008/cr08174.pdf. Accessed 1 June 2010.

International Monetary Fund (IMF). (2009, March). *The implications of the global financial crisis for low-income countries*. IMF Report, IMF Multimedia Services Division. Washington, DC: International Monetary Fund. http://www.imf.org/external/pubs/ft/books/2009/globalfin/globalfin.pdf. Accessed 1 June 2010

International Energy Agency. (2005). "International Energy Agency Estimates; International Energy Annual," IPM, cited in Pinaud, C. (2006). UnderstandingSudan.org, 2006. Accessed 20 Dec 2010. (pp. 1–2).

International Labour Organization. (2007). www.ilo.org. Accessed 10 Mar 2009.

Ministry of Labour and Public Service Annual Economic Reports.

Mohamed, S. A. (2008, June). *Economic globalization and requirements of improving the efficiency and outputs of technical and technological education*. Paper prepared for the Third Conference of Managers and Senior Directors of Technical Education in States. Khartoum: Ministry of Education, General Directorate of Technical Education. Table 4, p. 12.

Nour, S. (2011). Assessment of effectiveness of China aid in financing development in Sudan (UNU-MERIT working paper no. 2011–005), Maastricht, The Netherlands. http://www.merit.unu.edu/publications/wppdf/2011/wp2011-005.pdf. Jan 2011

Palma, G. (2003, May 19). *Four sources of de-industrialisation and a new concept of the Dutch Disease*. Paper presented at UNU- INTECH Research Seminar Series 2004-2, p. 21. Unpublished paper.

Phillips, A. W. (1958). The relationship between unemployment and the rate of change of money wages in the United Kingdom 1861–1957. *Economica*, *25*(100), 283–299.

Salih, S. H. (2004). *Sudanese oil: The story of the struggle of a nation* (pp. 21–40, 166, 93–94, 91, 182). Khartoum: Sudan Currency Printing Press Company Ltd (in Arabic).

Shaban, R. A., Assaad, R., & Al-Qudsi, S. S. (1995). The challenge of unemployment in the Arab region. *International Labour Review*, *134*. www.questia.com/PM.qst?a=o& se=gglsc&d-=5000320794. Accessed 20 Nov 2007.

Sudan Oil fact sheet on Sudan (2006, September). Produced by C. Pinaud for UnderstandingSudan.org, 2006, pp. 1–2

Sudan Central Bureau of Statistics. (2001, November). *Statistical year book*. Khartoum: Sudan Central Bureau of Statistics.

Sudan Central Bureau of Statistics. (2010). *Annul statistical year book and statistical series (1990–2009)* (p. 107). Khartoum: Central Bureau of Statistics, Sudan Ministry of the Cabinet

Sudan Central Bureau of Statistics. (2011). *Sudan national baseline household survey 2009*. Tabulation report, North Sudan. Table 9.1, p. 12.

Sudan Central Bureau of Statistics. (2012). p. 7. http://www.cbs.gov.sd/sites/default/files/Publications/April%20Bulletin.pdf. Accessed 3 June 2012

Sudan Central Bureau of Statistics – Department of Internal Commerce and Pricing.

Sudan Central Bureau of Statistics Population Census Data. (2010). *5th Sudan population and housing census (2008)*. Khartoum: Sudan Central Bureau of Statistics.

Sudan Factsheet Human Rights & Oil Workshop, (2003). cited in Pinaud, C. (2006). UnderstandingSudan.org, 2006. Accessed December 20, 2010. (pp. 1–2).

Sudan Factsheet Human Rights & Oil workshop (2003, January 31). pp 1–2.

Sudan Federal Public Service Recruitment Board – Statistics and Research Administration (2010), Khartoum. Accessed 15 Sept 2010

Sudan Health and Household Survey (2006). Khartoum, Sudan, 2006. cited in the UN Resident Coordinator's Support Office, Khartoum, Sudan: http://www.sd.undp.org/mdg_fact.htm, Accessed on June 01, 2010.

Sudan Ministry of Energy and Mining. (2008). Unpublished Report (2008), Khartoum, Sudan.

Sudan Ministry of Finance and National Economy. (1997–2007: Various Issues). *Annual economic survey report*.

Sudan Ministry of Finance and National Economy. (2000). *Annual economic survey 2000*. Table 7-2, p. 10.

Sudan Ministry of Finance and National Economy. (2002). *The Sudan economy in figure: 1990–2002* (1st ed.). Khartoum: Ministry of Finance and National Economy, Macroeconomic Policies and Programme Directorate MEPPD. p. 27.

Sudan Ministry of Finance and National Economy. (2006). *The performance of Sudan economy 2000–2005* Sudan Ministry of Finance and National Economy, Khartoum, Sudan, 2006 (pp. 16–18).

Sudan Ministry of Finance and National Economy. (2008). Unpublished report.

Sudan Ministry of Foreign Trade and Central Bank of Sudan Annual Foreign Trade Statistical Digest various issues (1992–2010): 2006: p. 20, p. 38. 2005: p. 38, p.20. 2004: p. 20, p. 39. 2002: p. 9, p. 24. 2000: p. 9, p. 24. 1998: pp. 12–13, pp. 33–34. 1997: pp. 12–13, pp. 33–34, 2010.

Sudan Ministry of Industry. (2005). *The comprehensive industrial survey* (Vol. 4). Khartoum, Sudan. www.industry.gov.sd

Sudan Ministry of Industry. (2005, July). *The comprehensive industrial survey (2005)*. Khartoum, Sudan. The executive summary of the comprehensive industrial survey (2005), p. 29. Accessed December 01, 2010

Sudan Ministry of Investment. (2009). Unpublished statistics and data from the feasibility studies (2009). Khartoum

Sudan Ministry of Labour and Administration Reform – Department of Planning and Monitoring and Follow-up, Khartoum.

Sudan Ministry of Labour and Public Service and Central Bureau of Statistics. (1996). Migration and labour force survey (1996). Khartoum.

Sudan Ministry of Labour. (2005). Sudan labour report (2004–2005). Unpublished report, Sudan Ministry of Labour. Khartoum.

Sudan Ministry of Welfare and Social Security and Sudan National Population Council General Secretariat (NPC/GS). (2011). *Sudan millennium development goals progress report 2010*. Khartoum. http://www.sd.undp.org/doc/Sudan%20MDGs%20Report%202010.pdf. Accessed 20 June 2011.

The Central Bank of Sudan. (2004). *The impacts of technologies on the banking sector in Sudan during the period 1999–2003*. Report of the Central Bank of Sudan, Statistical and Research Department Series, Issue No. 6, pp. 13, 36.

The Central Bank of Sudan Annual Report. (2009). p. 84.

The Central Bank of Sudan Annual Report (Various issues: 1999–2009). The central bank of sudan. Khartoum.

*The Economic Review*. (2012, June). Statistical Department- Central Bank of Sudan – Issue No 06/2012, p.3.

The World Bank (WB-DTS). (2008). *Revitalizing Sudan's non-oil exports: A Diagnostic Trade Integration Study (DTIS) prepared for the integrated framework program (December 2008)*. A Revised version of "Sudan Diagnostic Trade Integration Study (DTS), Poverty Reduction and Economic Management 2- Africa region, Draft: May 2, 2008, Decision Meeting: May 13, 2008": pp. viii–ix; 1–7. http://www.integratedframework.org/files/english/Sudan%20DTIS%20final.pdf. Accessed June 10, 2010.

The World Development Indicators (WDI)/IMF/World Bank Staff Estimate (2008), cited in the World Bank (WB-DTS). (2008). Revitalizing Sudan's non-oil exports: A Diagnostic Trade Integration Study (DTIS) prepared for the integrated framework program (December 2008). A Revised version of "Sudan Diagnostic Trade Integration Study (DTS), Poverty Reduction and Economic Management 2- Africa region, Draft: May 2, 2008, Decision Meeting: May 13, 2008", pp. viii–ix; 1–7.

The World Investment Report. (2002). The united nations conference on trade and development (UNCTAD). The World Investment Report (2002). Geneva: UNCTAD.

United Nations Development Group (2003) "Indicators for Monitoring the Millennium Development Goals: Definitions Rationale Concepts and Sources," September 2003. New York, United Nations Publication. pp. 5, 7, 9, 12, 14, 16, 20, 22, 24, 26, 29, 30, 32, 34, 36, 38, 40, 49, 53, 54, 64, 66: http://www.undp.or.id/mdg/documents/MDG%20Indicators-UNDG.pdf: Accessed on 3 November 2012.

UNDP (United Nations Development Programme). UNDP-HDR. (2007/2008). *Human development report 2007/2008: Fighting climate change: Human solidarity in a divided world* (pp. 231–232, 392–293). New York: UNDP/Palgrave Macmillan.

UNDP (United Nations Development Programme). (2009). Human development report 2009: Overcoming barriers: Human mobility and development. New York: Palgrave Macmillan.

United Nations Development Programme (UNDP). (2010a). *Human development report 2010: The real wealth of nations: Pathways to human development*. Human Development Report 2010 – 20th Anniversary Edition. New York: UNDP/Palgrave Macmillan, Statistical Tables, Statistical Annex, Table 12: Decent Work, p.191.

United Nations Development Programme (UNDP). (2010b). *UNDP Sudan country profile of Human Development Indicators (2010)*. http://hdrstats.undp.org/en/countries/profiles/SDN.html. Accessed 22 Dec 2010.

United Nations Development Programme (UNDP) in Sudan. (2006). Macroeconomic policies for poverty reduction: The case of Sudan. Khartoum, Table 8.1, p. 82.

United Nations Development Programme (UNDP)-The Arab Human Development Report (AHDR). (2003, July). *Arab human development report (2003): Building a knowledge society*. UNDP. New York/Amman: Regional Bureau for Arab States (RBAS)/National Press, p. 56, Table 5.1, p. 102.

United Nations Resident Coordinator's Support Office, Khartoum. http://www.sd.undp.org/mdg_fact.htm, Accessed 1 June 2010.

Wikipedia. http://en.wikipedia.org/wiki/Brain_drain. Accessed 14 Nov 2010.

www.africaneconomicoutlook.org/countries/east-africa/sudan/. Accessed 3 June 2012. UNCTAD 'World Investment Report' (2002).

http://www.springer.com/978-3-642-32810-7

Technological Change and Skill Development in Sudan

Mohamed Nour, S.

2013, XXX, 478 p. 66 illus., Hardcover
ISBN: 978-3-642-32810-7