Chapter 9
Education, Training and Skill Development Policies in Sudan: Macro–Micro Overview

Abstract This chapter uses some secondary data and the macro and firm surveys (2010) to analyse the educational, training and skill development policies in Sudan. We show that skill development depends on: reforming the educational system; enhancing the provision of training; planning skill needs and matching educational output with market needs; enhancing the transfer of knowledge/schooling effect; and incentives and collaboration between public and private institutions. We explain that the promotion of local technologies and adoption of appropriate foreign technologies and the interaction between both these to foster economic growth in Sudan depends on skill development. Our results show the low commitment to the standardised international adequacy, equity and efficiency criterion related to the supply and demand sides of educational and training policies. Moreover, we interpret the regional disparity in the demand and enrolment in education due to demographic reason, economic reasons and other reasons across the main regions in Sudan. Notably, our results imply that the incidence of high poverty rate seem to be the most important factor determining or limiting the demand and enrolment, notably, in basic education. We confirm our hypothesis 8 that the effective institutional environment and consistent policies of public and private institutions will enhance upskilling plan and skill development.

9.1 Introduction

Economists of different schools of thought have confirmed the essential role of education and human capital in the creation, acceleration and sustainability of economic growth, and improvement of the quality of life in any society. In particular, endogenous and new growth theories and empirical literature recognise

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the importance of human capital accumulation/formulation for economic growth in both developed and developing countries (cf. Lucas 1988; Romer 1990).[1]

In recent years, the UNDP-AHDR Reports (2002, 2003) and Arab Knowledge Report (2009) highlight the investment in human capital, education and knowledge in the Arab region. Earlier studies in the Arab Gulf and Sudanese literature show the importance of a good education and investigate the causes and consequences of deficient educational and training systems, the lack of knowledge transfer and upskilling in the Arab Gulf countries and Sudan (cf. Muysken and Nour 2006; Nour 2005b, c; Al-Sanousi 1999; Al-Sulayti 2002; Suleiman 2007; Jalal al-Din 2002). From that perspective, therefore, it is convenient in this paper to discuss the educational and training policies and to provide insights to help generate policies to enhance skill upgrading by implementation of sound plans and consistent relevant policies for skills development: enhancing the educational system and provision of training and transfer of knowledge/external schooling effects at the macro–micro levels in Sudan. Thus, our paper is relevant to contribute to the few studies that address some aspects in relation to educational and training systems and policies in Sudan and to go beyond these studies, by providing a more comprehensive analysis to complement the earlier studies in the Sudanese literature (cf. Suleiman 2007; Jalal al-Din 2002).

Different from earlier studies an interesting element in our analysis is that we discuss both the supply and demand sides of educational policies in Sudan. Moreover, a novel element in our paper is that we use new primary macro and micro (firm) surveys data (2010) to discuss and compare the macro and micro views/perspectives concerning plans, policies and mechanisms implemented to improve skill upgrading: education, training and transfer of knowledge. In addition, our new results in this paper are consistent with the results in the literature (cf. Nour 2005c) since we show the lack of effective interaction between educational and training policies and a lack of incentives for provision of training within private firms in Sudan, our analysis presents a new element by showing limited commitment to implementation of training and skill upgrading policies only within the two largest mixed and private firms and a further duality/discrepancy at the micro level/across small-medium and large private firms. Our findings are consistent with the results in the Sudanese and Arab literature concerning the poor quality of education and the Sudanese literature concerning the low commitment to the standardised international adequacy, equity and efficiency criterion related to educational policies. Different from the Sudanese literature (Suleiman 2007; Jalal al-Din 2002), an interesting element in our analysis is that we provide a more elaborate and comprehensive analysis concerning the serious problem of poor quality of education and low commitment to the standardised international adequacy, equity and efficiency

[1] For theoretical and empirical literature on the importance of human capital see for instance, Stokey (1991), Schultz (1961), Mulligan and Sala-i-Martin (1995), Mincer, (1984, 1989), Mankiw et al. (1992), Barro (1991, 1996), Barro and Lee (1993, 1996, 2000, 2010), Becker (1962, 1964), Romer (1990) and Lucas (1988).

criterion related to the supply and demand sides of educational and training policies in Sudan. We explain that the low commitment to the standardised international adequacy, equity and efficiency criterion is obvious not only from the supply side, but also holds from the demand side for education and training policies. Finally, we provide a new contribution and fill important gap in the Sudanese literature by explaining the regional inequality and disparity in the supply and demand sides of education and training. Notably, we explain that the observed regional disparity in the demand for education (defined by the share in total enrolment in education) is most probably interpreted due to economic reasons (defined by per capita income and poverty rate), demographic reasons (defined by the share in total population) and other reasons (defined by the degree of urbanisation) across main regions in Sudan. Notably, we find that the increase in the incidence of high poverty rate and low per capita income seem to be the most important factor limiting enrolment and demand for education, notably, demand for basic (primary) education, mainly for females in Sudan.

Based on the above, this paper aims to give an empirical investigation and policy analysis of skill development at the macro–micro levels. First we discuss the supply–demand sides: the major characteristics and implications of educational and training policies, we highlight the need for prioritising skill development and we provide insights to help generate policies to reform the educational and training systems and upskilling of the labour force to foster economic growth and development in Sudan. Second, we examine the major mechanisms for reforming educational system, upgrading skills, enhancing the provision of training and the external effect of schooling/transfer of knowledge at the macro level in Sudan. Third we substantiate the need for consistent macro–micro/public-private policies to ensure the effective implementation of educational and training policies, skills upgrading and the external effect of schooling. Based on the above objectives, this Chapter aims to examine hypothesis 8 in Chap. 1 above that first Sudan needs to upgrade skill through the relevant policies for enhancing educational system, provision of training and transfer of knowledge/external schooling effect at the macro–micro levels. Second, educational reform will have positive implications on: (a) enhancing training provision; (b) skill upgrading; (c) planning skill needs and matching educational output with the needs in the labour market; (d) enhancing the transfer of knowledge/schooling effect; and (e) collaboration between public and private institutions. Third, effective institutional environment and consistent policies of public and private institutions will enhance upskilling plan and skill development.

To fulfil our objective and test our hypothesis, we follow the new growth theories and literature in viewing and using a more broad definition of human capital and its accumulation, including education, training and external effect of schooling. We use the UNESCO conceptual framework and define education indicators as composed of: (1) Input indicators including both financial or public and private spending on education and human resources allocated in education, and (2) Output (quantitative and qualitative schooling indicators), which is defined by many indicators. We integrate the descriptive and comparative methods of analysis

and use a combination of new primary and secondary data and information covering the macro–micro levels to test our earlier hypotheses and draw the major policy implications and conclusions on enhancing the educational and training systems. We use a new primary data based on the firm and macro surveys at the micro and macro levels respectively.[2]

The rest of this paper is organised as follows: Sect. 9.2 discusses the supply–demand sides: the major characteristics and implications of educational policies in Sudan based on data and information obtained from the UNESCO, UNDP, Sudan Ministry of Education and other relevant sources. Section 9.3 explains the major characteristics of training policies and examines the training and skill upgrading policies implemented by the large mixed and private firms in Sudan based on data and information obtained from these firms. Section 9.4 uses the results of the macro and firm surveys held in Sudan (2010) and the follow-up interviews to present the macro–micro views and suggestions for relevant mechanisms and policies for skill development: enhancing the educational system, provision of training and transfer of knowledge/external schooling effect. Section 9.5 provides the conclusions.

9.2 Characteristics of Educational Policies in Sudan: Supply, Demand, Quality and Impacts

This Section discusses the supply–demand sides: the major characteristics and implications of educational policies in Sudan.

9.2.1 Characteristics of Educational Policies in Sudan

Before proceeding to discuss upskilling policies, it may be useful to begin with a brief explanation of the major characteristics of educational policies in Sudan, in particular the structure and pattern of educational policies, the supply side as measured by resources or priority of financial and human investment in education. In addition, we examine the demand for education as indicated by enrolment ratios and access to schooling and the impacts on literacy, school life expectancy, training and quality of education.

[2] The firm survey (2010), 'Technological Change and Skill Development: A Comparative Study of Chemical, Food, Metal and Textile Small, Medium and Large Scale Enterprises in Sudan', covered 100 medium and large size firms active in the chemical, food metal and textile industries in Sudan in 2010. The macro survey, 'Reform of Education, Human Resources Development and Policy Intervention', has been circulated amongst 40 of policy makers and experts in 8 public, university, educational, training and research institutions in Sudan in 2010. The surveys were held in Sudan in 2010, the response rates of the firm and macro surveys are 87 % and 90 % respectively.

The UNESCO-UIS (2011) information on the structure/nature of educational system implies an insufficient duration of compulsory education in Sudan.[3] For instance, the duration of compulsory education in Sudan lasts for 8 years and falls behind the international standard of 12–13 years of compulsory education attendance in the advanced countries such as the US, UK, Belgium, Germany and Netherlands and 9–11 years in Korea, Japan and Canada respectively.[4]

Moreover, in Sudan as in most Arab countries, the structure and pattern of the educational policies is characterised by a centralised bureaucracy, which, as remarked by Al-Sulayti, "implies a high degree of centralization and intervention from the governments/ministries of education to control all the educational institutions".[5] Sometimes, the education and higher education institutions lack independence and initiatives in the area of R&D. They are often subordinate to and/or feel the negative effects of state bureaucracy, routine, institutional rigidity and lack of transparency, dynamism, flexibility, planning, organisational development, monitoring and assessment. They also sometimes, lack a proper articulation of "educational policies, dynamism, flexibility, planning, organizational development, monitoring, assessment, cooperation and problem solving ability".[6] (Cf. Suleiman 2007; Jalal al-Din 2002).

9.2.2 *The Supply Side of Educational Policies: Financial and Human Resources*

We use the UNESCO definition to show the supply side/priority of educational investment as measured by financial resources (public and private educational investment, percentage share of public spending on education in GDP and total government spending) and human resources (teaching staff). Next, we show the demand for education (enrolment ratios) and impact in Sudan.

We discuss the adequacy, equity and efficiency criterion related to the supply and demand sides of educational policies. In particular, we begin with the analysis of the standardised international adequacy criterion which was earlier adopted in the 1960s and focused on the supply side that implies the allocation of either 8 % of GDP on education or 20 % of total government or public spending on education. In addition, we explain the extended international adequacy criterion that later

[3] Suleiman (2007), p. 123, indicates the necessity for making basic education free and compulsory at the same time in Sudan.

[4] See the UNESCO Education Statistics, UNESCO-UIS (2011) website for global statistics on education: http://stats.uis.unesco.org/unesco/TableViewer/tableView.aspx?ReportId=163, 'Background information on education statistics in the UIS Data Centre: Beyond 20/20 WDS', accessed February 22, 2011.

[5] See Al-Sulayti (2002), pp. 29–30.

[6] See Fahmey and Mahmoud (1993), pp. 29–30.

Table 9.1 Public expenditures on education in the Sudan compared to world countries (1990–2001/2002)

	Public expenditure on education as percentage of						
	GDP[a, b, c]			Total government expenditures[a, b]			
Country	1990[a]	1998/1999[b]	1999–2001[a]	1990[a]	1995/1997[d]	2000/2001[b]	2001/2002
Sudan[e]	0.9	0.6 (1991)	1.4 (1996)	2.8	8.4	6.4	6.9
Bahrain	4.2	3.67	3.00	14.6	12	11.41	n/a
Kuwait	4.8	n/a	6.6	3.4	14	n/a	14.8
Oman	3.1	3.87	4.2	11.1	16.4	18.2	21.5
Qatar	3.5	3.58	3.6[c]	11.1	n/a	n/a	n/a
Saudi Arabia	6.5	9.47	8.3[c]	17.8	22.8	22.7	24.8
United Arab Emirates	1.9	1.95	1.9[c]	14.6	20.3	22.2	22.8
United States	5.2	5.01	5.6	12.3	14.4	15.5(1)[a]	17.1
Sweden	7.4	7.98	7.6	13.8	12.2	13.40	12.8
Norway	7.1	7.68	6.8	14.6	16.8	16.18	16.1
Republic of Korea	3.5	4.07	3.6	22.4	17.5	17.38	14.7
United Kingdom	4.9	4.71	4.6	n/a	11.6	11.4	11.4

Note (1) Data refers to the year (1999–2001)
[a]UNDP Human Development Report (2004).
[b]UNESCO–UIS (2003).
[c]UNESCO–UIS (2004c) country profile: data refers to the most recent years between 1998 and 2002.
[d]UNDP Human Development Report (2002).
[e]Sudan Ministry of Finance-Ministry of Education (2003: 12).

adopted by the World Bank in the 1970s and extended to include the demand side that implies the adequacy in intake and enrolment rates in primary and secondary education, gender equity in enrolment in education and literacy rate of population. Furthermore, we then discuss the equity criterion, which implies the equal distribution and allocation of financial resources to achieve the balance between the different education sectors and between different geographical rural and urban areas. Moreover, we then examine the international efficiency criterion which implies that the low efficiency often appears from the low rates of attendance, high rates of dropout, high rates of repetition, weak rates of success in final exams, low rates of trained teachers and overcrowded classrooms as indicated by the rate of students enrolment per education institutions.[7]

We begin with the adequacy of the supply side and priority of public investment in education as measured by the financial resources devoted to education, which is indicated by the share of public spending on education as a percentage of GDP and total government expenditures. For instance, Table 9.1 illustrates that the low adequacy and priority of public spending on education, as measured by public spending on education as a percentage of GDP and of total government spending in

[7] See Suleiman (2007), pp. 121–123.

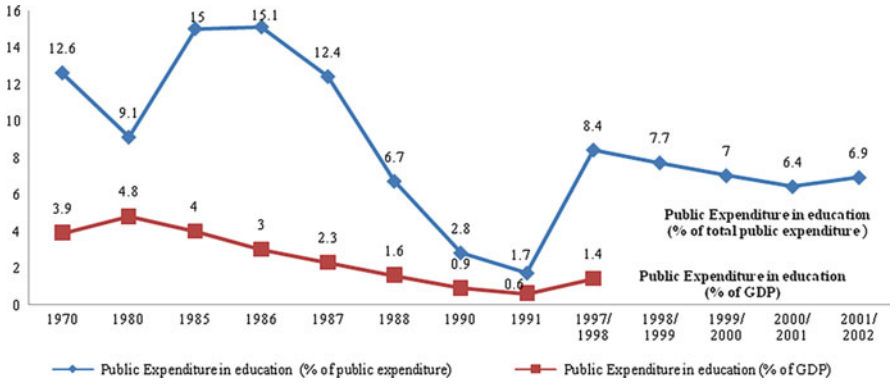

Fig. 9.1 Public expenditures on education as a percentage of total public expenditure and GDP in the Sudan (%) (1970–2001/2002) (Source: Sudan Ministry of Finance cited in Sudan Ministry of Education, Educational Planning Section of Educational Statistics (2003: 12))

Sudan lag far behind the levels prevalent in the Arab Gulf countries and the developed countries. For instance, in the period 1995–2000, the highest public spending on education as percentage of GDP and total government expenditure in Saudi Arabia was close to three and six times those of Sudan respectively. Moreover, public spending on education as a percentage of GDP shows considerable disparity and fluctuation in Sudan over the period 1970–2002. For instance, we observe the great and continuous decline in public spending on education as percentage of GDP from 4.8 % in 1980 to 4 %, 0.9 %, 0.6 % and 1.4 % in 1985, 1990, 1991 and 1996 respectively. In addition, the great and continuous decline in the trend of public spending on education also holds for the trend of public spending on education as a percentage of total government expenditure, for instance, we observe that over the period 1986–2001/02, public spending on education as percentage of total government and public expenditure in Sudan continuously declined from 15.1 % in 1986 to 2.8 %, 8.4 %, 7.7 %, 7 %, 6.4 % and 6.9 % in 1990, 1997/98, 1998/99, 1999/2000, 2000/01 and 2001/02 respectively (see Table 9.1 and Fig. 9.1 below). These findings imply that until recently the low adequacy of the supply side and public investment in education in Sudan remained low and fell below the standardised international adequacy criterion which was earlier adopted in the 1960s and related to the supply side and implies the allocation of either 8 % of GDP on education or 20 % of total government or public spending on education. These results led to increasing debate that the low commitment to standardised international adequacy criterion is somewhat surprising in view of the structural change in Sudan economy that turned into an oil dependent economy in 1999, which implies that the increasing revenues from oil has the potential to enhance increasing spending on social development issues including health and education. Based on this increasing debate, we are aware of the fact that it may be useful to depart from the analysis of general standardise education indicators and to use indepth economic, historical and social evidence to extend our analysis to focus

more explicit on whether the production and export of oil (natural resource-based exports) affected the education infrastructure and the growth and development trajectory of Sudan economy. This may be particularly important in view of the fact that the production and export of oil has significant positive impacts on Sudan's economy as it leads to impressive growth in GDP growth rate and change in the structure of Sudan's economy, but unfortunately it is only unsustained growth, mainly because of uncertainty and high fluctuation in oil price in the international market; for instance, the recent global financial and economic crisis led to significant negative impact on Sudan's economy due to high dependence on oil revenues and oil exports. We are aware of the fact that it may be interesting to explain the impact of oil in education and training, but due to practical problems related to availability of adequate and reliable data, unfortunately it will not be possible to discuss this issue in this chapter, so we leave that for a more indepth analysis in our future research. Furthermore, we believe that most probably the impacts of oil in education and training might be still very limited in view of the very recent start of production and exports of oil just before 11 years in 1999. Moreover, although oil leads to increase in public spending and increase in the share of development expenditure as a percentage of total public expenditure from 9 % in 1999 to around 31 % in 2004, its share declined and sustained at 24 % from the total public spending over the period 2006–09. Furthermore, the development expenditures include all public spending in development issues including public spending on education, health, etc. Therefore, this implies that it is not at all clear and it is somewhat problematic to distinguish the share and growth of spending on education that is mainly attributed to production and export of oil, but it is important to realise that at the macro level in the pre- and post-oil periods the share of spending on education as a percentage of GDP most probably remained below the standardised international adequacy criterion of spending 20 % of total government or public spending on education. In addition, also due to practical problems related to availability of adequate and reliable data unfortunately it will not be possible to give an indepth analysis of the impact of the private oil companies spending on education and training at the micro level. So, we hope to cover these issues in our future studies when adequate and reliable data are available; therefore, our analysis focuses on two interpretations of the low commitment to the standardised international adequacy criterion in Sudan. Our first interpretation of the low commitment to the standardised international adequacy criterion in Sudan despite the increasing oil revenues, is that it is probably true that both uncertain public revenues (oil revenues in particular) and increasing competition for these revenues for defence (due to political instability) and infrastructure spending, notably, the increasing public spending on defence and security issues probably put further pressure on public spending on education and make it difficult for the government in Sudan to continue allocating high proportions of public revenues on education.

Moreover, our second explanation for the low commitment to the standardised international adequacy criterion is probably related to the potential limitation of the private spending on education to compensate the declining public spending on education despite the recent increasing expansion and facilities offered for the

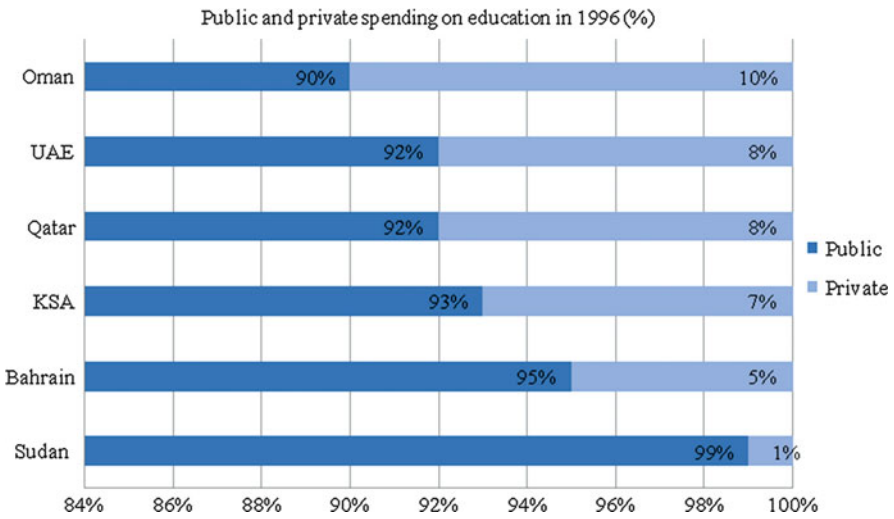

Fig. 9.2 Distribution and share of public and private spending on education in Sudan and Arab Gulf countries (1996) (Source: UNESCO–UIS (2000) World Education Report (2000): UNESCO's World Education Indicators, (b) UNESCO- UIS (2003))

introduction of private education institutions in Sudan. For instance, one important common characteristic of educational policies in Sudan and most Arab countries is the lack of incentives or marginal contributions of the private sector on educational investment (see Fig. 9.2 below). One shared feature of the education policies in the Arab countries is that public education is perceived as being very important for development. However, as indicated by Al-Sulayti, both uncertain public revenues (oil revenues in particular) and increasing competition for these revenues for defence and infrastructure spending make it difficult for oil dependent Arab countries to continue allocating high proportions of public revenues on education.[8] More recently though, following the declining trends of public spending, private spending on education shows an opposite increasing trend, it has increased slightly to fill the funding gap in Sudan as in most of the Arab and Arab Gulf countries; however, educational investment is still almost entirely public. In Sudan the extent of privatisation shows an increasing trend in tertiary education faster than in secondary and basic education respectively (see Figs. 9.2, 9.3, 9.4, and 9.5). In Sudan until 1989/90, tertiary education was publicly provided: there are only 2 private compared to 17 public higher education institutions and universities; the number of private tertiary education institutions increased from 2 in 1989/90 to 26 in 1999/2000 and the share of private tertiary education institutions increased from 11 % in 1989/90 to 50 % in 1999/2000 to be equivalent to the share of public

[8] See Al-Sulyati (2002).

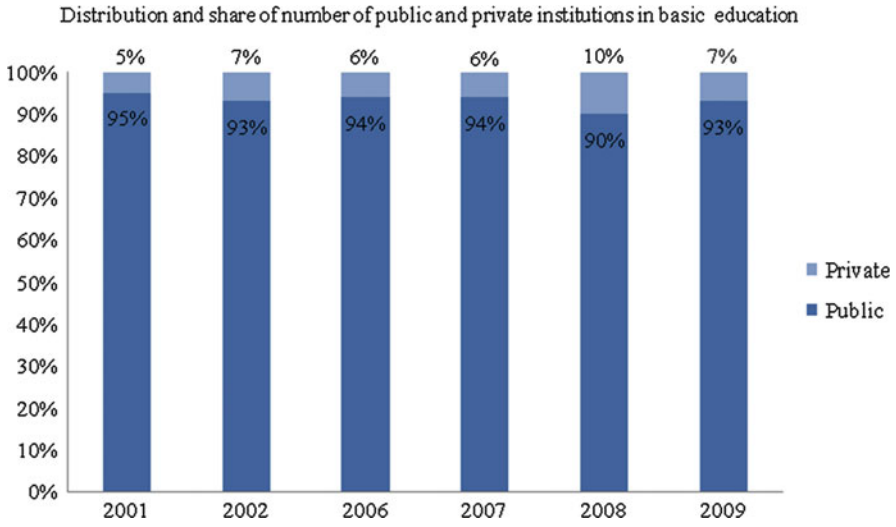

Fig. 9.3 Distribution and share of number of public and private institutions in basic education in Sudan (2001–2009) (%) (Sources: Own calculation based on Table 9.4)

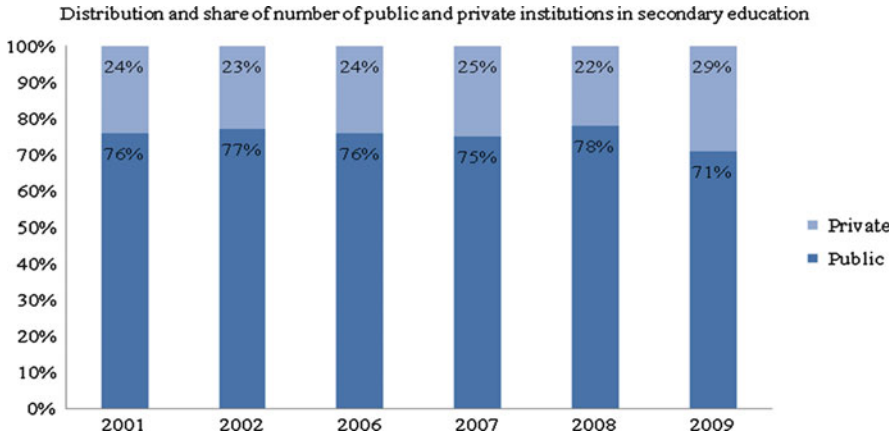

Fig. 9.4 Distribution and share of number of public and private institutions in secondary education in Sudan (2001–2009) (%) (Sources: Own calculation based on Table 9.4)

tertiary education institutions; in 2008/09 the share of private (52 %) is larger than the share of public (48 %) in total higher education institutions in Sudan.[9] However, the increasing private investment on education should not hide the fact that educational investment is almost entirely dependent on the public sector, with a very minimal contribution from private sector in Sudan (see Table 9.4 below).

[9] See Sudan Central Bureau of Statistics (2010), 'Annul Statistical Year Book and Statistical Series (1990–2009)', p. 107.

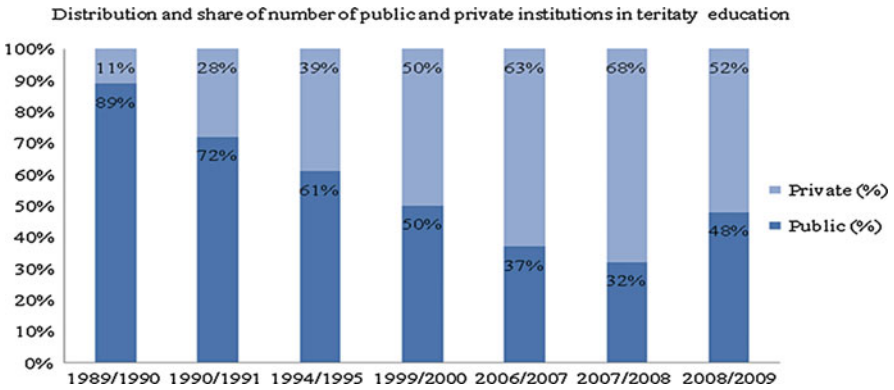

Fig. 9.5 Distribution and share of number of public and private institutions in tertiary education in Sudan (1989/1990–2008/2009) (%) (Sources: Own calculation based on Table 9.4)

Furthermore, the low commitment to the standardised international adequacy and efficiency criterions in the supply side is clear from the inadequacy, poor efficiency and quality of financial resources and physical infrastructure as measured by the overcrowded classrooms as indicated by students enrolment per education institutions in Sudan (see Table 9.2 below). Moreover, we find that the low commitment to the equity criterion in the supply side appears from the priority and trend of distributing the public and private investment in education between the different education levels in Sudan. One common characteristic of educational policies in Sudan and Arab countries is that the distribution/allocation of public investment on various educational levels tends to prioritise either primary or secondary education and seriously neglect tertiary education. Table 9.2 shows that despite the recent gradual increase in total investment in basic, secondary and tertiary educational levels as measured by the number of institutions, number of students and teachers in Sudan over the period 1993/94–2008/09, however, the distribution of increasing investment and physical infrastructure on education as measured by the number of education institutions is still biased towards basic education followed by secondary education, in general the share of investment on tertiary education remains marginal and insufficient and even shows a declining trend in Sudan as in many Arab countries. In our view the distribution of investment by educational levels may be related to both potential share of students in total population and costs of various educational levels as measured by spending per pupils, thus the low investment and spending in tertiary education is probably related to low share of potential student in tertiary education in total population and high costs of spending on tertiary students as compared to secondary and primary pupils and also probably because of high poverty rate in Sudan.[10]

[10] By contrast Jalal al-Din (2002) argues that the tragic reality of public education in some Arab and African countries is due to limited public and private spending that holds for all levels of education. But at least in many cases, the percentage of public spending on basic education is less

In addition we observe the low commitment to equity and the incidence of wide regional disparity between the main geographical regions in Sudan in terms of both supply of and demand for education.[11] As for the commitment to equity criterion in the supply side we observe that the priority and trend of distributing the public and private investment in education varies across the main geographical regions in Sudan. For instance, Tables 9.3 indicates the low commitment to equity and the incidence of regional disparity that appears from the share of the main regions in public, private and total number of schools in basic and secondary education in Sudan over the period 2001–2009. For instance, we observe the large share of the central region followed by Darfur, Kordofan and Khartoum as compared to Eastern, Southern and Northern regions in total numbers of basic schools and the large share of the central region followed by Khartoum, Darfur and Kordofan as compared to Northern, Eastern and Southern regions in total numbers of secondary schools over the period 2001–2009. Furthermore, from Table 9.4 we observe the large share of the central, Darfur, Kordofan and Khartoum regions as compared to Northern, Eastern and Southern regions in total numbers of public basic and secondary schools over the period 2001–2009. Moreover, we observe the low commitment to equity and incidence of wide regional disparity between the main regions in Sudan in terms of the participation of private sector in basic and secondary education as can be seen from the heavy concentration of privatisation in Khartoum region that has the largest share in terms of private basic and secondary schools as compared to other regions. This probably implies the low commitment to equity and incidence of unbalanced or biased distribution of allocation of investment, resources and infrastructure in education as measured by the number of schools for basic and secondary educational levels which is probably related to an unbalanced spending and development planning in education. This low commitment to equity and incidence of unbalanced regional distribution in the supply side includes not only the financial resources, investment and physical infrastructure in education as measured by the share in total and public and private schools, but also includes human resources in education as measured by both the total number of teachers and

than the proportion of spending on higher education, for example, in Sudan, spending on the basic education, which extends to 8 years in Sudan, exclusively accounted only for about 43 % of the total spending on higher education. This is in spite of the fact that basic education includes more than three million students, a number nearly ten times the proportion of students in higher education. However, spending on higher education after the expansion is still very limited unless it is compared to the tragic situation of general education. Hence, there is urgent need to allocate more resources to the entire education sector, notably, by giving high priority to public and general education. See Jalal al-Din (2002), pp. 23–24.

[11] In this research our analysis of the supply and demand for education from regional perspective is based on the classification of Sudan geographical areas according to main seven geographic regions that includes the Northern, Khartoum, Central, Kordofan, Darfur, Eastern and Southern regions. In particular, this classification implies that the Northern region includes Northern and Nahr Alnil states, the central region includes Al Gezira, Sinnar, White Nile and Blue Nile states, the Eastern region includes Red Sea, Algedarif and Kassala states, the Western region includes Kordofan and Darfur regions that include all the states which are located in Kordofan and Darfur respectively and the Southern region includes Bahr Elghazal, Equatoria and Upper Nile states.

Table 9.2 The distribution of current investment in basic, secondary and tertiary educational level in Sudan (1993/1994–2008/2009)

	1993/1994	1995/1996	1996/1997	1997/1998	2000/2001	2003/2004	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
Number of institutions											
Basic	12,515	10,713	10,969	11,278	12,539	11,541	14,071	15,089	15,907	18,095	18,052
Secondary	641	1206	1422	1648	1835	1642	2268	2877	3224	3478	3455
Tertiary	29	47	45	47	57	68	72	73	78	90	106
Number of students											
Basic	2,823	2,963.7	2,978.8	3,030.7	3,451.6	3,966.9	4,299.7	4,713.4	4,785.9	5,253	5,800
Secondary	292.8	363.7	448.5	485.6	437.5	526.2	611.6	569.7	602.9	648	753
Tertiary	116.2	125.7	171.6	172.3	254	315	447	488	440.2	508.2	519
Number of teachers											
Basic	73,654	94,414	98,747	103,082	125,391	136,401	141,315	143,327	145,999	155,023	161,345
Secondary	7,909	9,902	12,117	13,247	19,783	22,951	32,917	34,222	38,953	39,874	43,028
Tertiary	5,268	3,148	5,394	5,623	7,481	7,804	9,248	10,063	10,251	12,560	12,720
Pupils teacher ratio											
Basic	38	31	30	29	28	29	30	33	33	34	36
Secondary	37	37	37	35	22	23	19	17	15	16	18
Tertiary	22	50	32	31	17			15	15	22	13(1)
Pupils institution ratio											
Basic	226	277	272	269	275	344	306	312	301	290	321
Secondary	457	302	315	295	238	320	270	198	187	186	218
Tertiary	4,007	2,674	3,813	3,666	4,456	4,632	6,208	6,685	5,644	5,647	4,896(1)

Note (1) Data refers to (2009/2010)

Sources: (a) Sudan Ministry of Education, the Annual Educational Statistics Reports Various Issues (2001–2009): (2000–2001: 17), (2001–2002: 11), (2003–2004: 9), (2004–2005: 9), (2005–2006: 9), (2006–2007: 6), (2007–2008: 11), (2008–2009: 28), (b) Sudan Ministry of Higher Education and Scientific Research, the Annual Educational Statistics Reports Various Issues (1993/1994–2009/2010)

Table 9.3 Regional distribution and share of main regions in total number of schools in basic and secondary education in Sudan (%) (2001–2009)

	Number of basic school							Number of secondary school						
Share in total (%)	2001	2002	2004	2006	2007	2008	2009	2001	2002	2004	2006	2007	2008	2009
All Sudan	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Northern	9 %	9 %	9 %	7 %	7 %	7 %	7 %	10 %	10 %	9 %	8 %	8 %	8 %	8 %
Khartoum	14 %	15 %	12 %	13 %	13 %	12 %	13 %	24 %	28 %	25 %	23 %	24 %	30 %	25 %
Central	27 %	26 %	27 %	24 %	23 %	25 %	22 %	32 %	30 %	35 %	37 %	37 %	35 %	35 %
Kordofan	17 %	17 %	20 %	15 %	15 %	16 %	17 %	8 %	7 %	9 %	8 %	8 %	8 %	9 %
Darfur	20 %	19 %	19 %	21 %	20 %	19 %	21 %	12 %	13 %	11 %	13 %	12 %	9 %	12 %
Eastern	11 %	12 %	10 %	10 %	11 %	12 %	11 %	10 %	10 %	9 %	8 %	8 %	7 %	7 %
Southern	3 %	3 %	3 %	10 %	9 %	9 %	9 %	3 %	2 %	3 %	3 %	3 %	3 %	3 %

Sources: Own calculation based on Sudan Ministry of Education, the Annual Educational Statistics Reports Various Issues (2001–2009): (2000–2001: 39–43, 50–52), (2001–2002: 67–70, 88–89), (2003–2004: 74–77, 97–99), (2004–2005: 77–80, 102–104), (2005–2006: 76–79, 97–98), (2006–2007: 79–82, 114–115), (2007–2008: 79–82, 115–116), (2008–2009: 100–103, 136–137)

Table 9.4 Regional distribution and share of main regions in total, public and private basic and secondary schools and the share in total public and private tertiary education institutions in Sudan (%) (1989/1990–2008/2009)

	Public						Private					
	2001	2002	2006	2007	2008	2009	2001	2002	2006	2007	2008	2009
(a) Basic												
All Sudan	94.9 %	93.2 %	94.1 %	93.8 %	90.2 %	92.6 %	5.1 %	6.8 %	6.0 %	6.2 %	9.8 %	7.4 %
Northern	8.3 %	8.5 %	7.3 %	7.2 %	6.5 %	6.8 %	0.2 %	0.2 %	0.1 %	0.1 %	0.2 %	0.1 %
Khartoum	13.0 %	11.8 %	9.5 %	9.4 %	8.5 %	8.8 %	1.2 %	3.3 %	3.0 %	4.0 %	3.7 %	4.2 %
Central	25.9 %	24.9 %	23.3 %	23.0 %	21.3 %	21.7 %	0.6 %	0.6 %	0.4 %	0.3 %	3.2 %	0.6 %
Kordofan	16.4 %	16.7 %	15.1 %	14.8 %	15.1 %	16.3 %	0.4 %	0.4 %	0.4 %	0.5 %	0.8 %	0.5 %
Darfur	19.0 %	18.3 %	19.2 %	18.9 %	17.8 %	19.9 %	1.0 %	1.2 %	1.3 %	0.7 %	1.4 %	1.5 %
Eastern	9.4 %	10.2 %	9.4 %	10.8 %	11.7 %	9.5 %	1.2 %	0.7 %	0.7 %	0.6 %	0.6 %	0.6 %
Southern	2.9 %	2.8 %	10.3 %	9.7 %	9.4 %	9.8 %	0.5 %	0.5 %	0.0 %	0.0 %	0.0 %	0.0 %
(b) Secondary												
All Sudan	76.5 %	77.2 %	75.8 %	74.6 %	77.8 %	71.2 %	23.5 %	22.8 %	24.2 %	25.4 %	22.2 %	28.8 %
Northern	9.6 %	9.5 %	7.2 %	7.4 %	6.7 %	7.1 %	0.3 %	1.0 %	0.7 %	0.4 %	0.4 %	0.6 %
Khartoum	14.0 %	13.2 %	11.1 %	10.3 %	18.3 %	9.9 %	10.8 %	10.3 %	11.9 %	13.9 %	12.6 %	15.1 %
Central	27.0 %	26.6 %	33.4 %	36.2 %	32.4 %	32.5 %	5.7 %	4.6 %	2.9 %	2.1 %	3.1 %	3.5 %
Kordofan	8.1 %	7.2 %	7.2 %	6.5 %	6.2 %	6.5 %	0.5 %	0.5 %	0.9 %	1.9 %	1.8 %	2.8 %
Darfur	8.7 %	11.7 %	8.1 %	6.5 %	6.9 %	6.5 %	3.0 %	3.2 %	6.2 %	5.4 %	2.3 %	5.2 %
Eastern	7.1 %	6.8 %	6.7 %	5.8 %	4.8 %	5.3 %	2.5 %	2.5 %	1.5 %	1.7 %	2.1 %	1.7 %
Southern	2.1 %	2.2 %	2.1 %	2.0 %	2.6 %	3.4 %	0.7 %	0.7 %	0.0 %	0.0 %	0.0 %	0.0 %

	Public							Private						
(c) Tertiary														
Institutions	1989/1990	1990/1991	1994/1995	1999/2000	2006/2007	2007/2008	2008/2009	1989/1990	1990/1991	1994/1995	1999/2000	2006/2007	2007/2008	2008/2009
Total	17	18	25	26	29	29	51	2	7	16	26	49	61	55
Share (%)	89 %	72 %	61 %	50 %	37 %	32 %	48 %	11 %	28 %	39 %	50 %	63 %	68 %	52 %

Sources: Own calculation based on Sudan Ministry of Education, the Annual Educational Statistics Reports Various Issues (2001–2009): (2000–2001: 29–38, 44–49), (2001–2002: 52–54, 63–66, 76–77, 82–83), (2003–2004: 59–62, 70–73, 83–85, 90–91), (2004–2005: 58–61, 73–76, 87–89, 94–96), (2005–2006: 61–64, 73–75, 85–86, 91–92), (2006–2007: 59–62, 75–78, 88–89, 94–95), (2007–2008: 62–65, 75–78, 88–89, 95–96), (2008–2009: 84–87, 96–99, 109–110, 116–117)

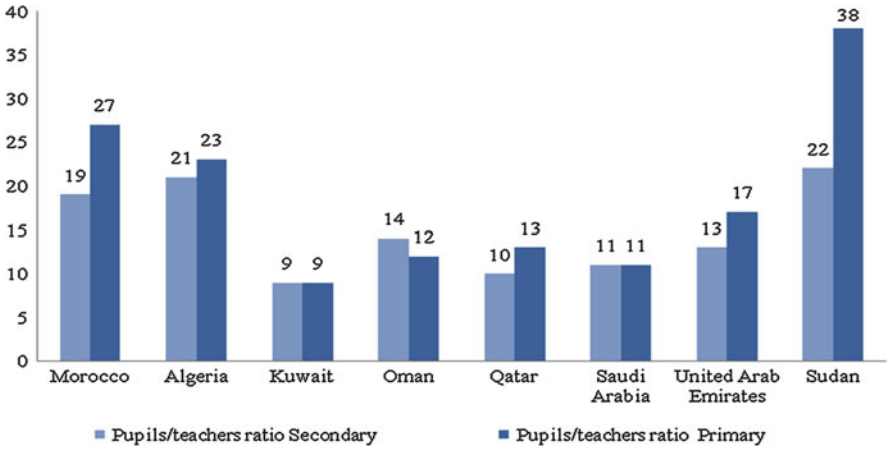

Fig. 9.6 Distribution of pupils teachers ratios in basic and secondary education in Sudan as compared to Arab and Gulf countries (2008/2009) (Source: UNESCO Global Background information on Education Statistics: UNESCO- UIS Data Centre: Beyond 20/20 WDS (2011))

the pupils teachers ratios in basic and secondary education. This low commitment to equity and incidence of unbalanced regional distribution in the supply side probably has further implications for low commitment to equity and incidence of regional distribution in the demand side as measured by the share and distribution of students enrolment in total, public and private basic and secondary education as we will explain below in this section. Suleiman (2007) discusses the equity standard criterion and notes that the imposition of tuition fees does not help to achieve this equity standard criterion and to reduce differences between high income earners and low income earners (see Suleiman 2007: 122).

The standardised international adequacy criterion of human resources in education or teaching staff can be defined by pupil-teacher ratios. Figure 9.6 below shows that the adequacy of human resources and teaching staff varies across the Arab countries including Sudan and the adequacy of human resources in education is generally better for secondary education when compared to primary education and, in sometimes, to tertiary education (see also Table 9.5 below). One serious problem with respect to human resources in education in Sudan is the low commitment to the standardised international adequacy criterion in terms of quantity of teaching staff as measured by the high pupils/teachers ratio in primary and secondary education and in terms of quality and efficiency of teaching staff as measured by the low share of trained teachers in primary, secondary and tertiary education in Sudan as compared to other Arab and Gulf countries (see Figs. 9.6, 9.7, and 9.8 below). As reported in the Sudanese and Gulf literature, "the educational system in Sudan and Gulf countries suffers from serious weak performance/low quality of teachers due to a lack of trained teachers and weak teaching skills and knowledge of recent

Table 9.5 Regional distribution and share of regions in total number of teachers and pupil teacher ratios in basic and secondary education in Sudan (%) (2001–2009)

	Basic number of teachers							Secondary number of teachers					
Total number of teachers	2001	2002	2005	2006	2007	2008	2009	2001	2005	2006	2007	2008	2009
All Sudan	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Northern	13 %	11 %	9 %	9 %	10 %	10 %	9 %	7 %	7 %	8 %	6 %	10 %	10 %
Khartoum	17 %	18 %	19 %	17 %	19 %	18 %	20 %	33 %	45 %	27 %	35 %	28 %	28 %
Central	35 %	29 %	29 %	29 %	29 %	28 %	28 %	31 %	25 %	37 %	29 %	29 %	30 %
Kordofan	10 %	12 %	12 %	12 %	12 %	11 %	12 %	7 %	6 %	7 %	8 %	9 %	8 %
Darfur	11 %	17 %	13 %	13 %	12 %	14 %	12 %	9 %	7 %	9 %	8 %	12 %	9 %
Eastern	12 %	9 %	9 %	10 %	9 %	9 %	11 %	8 %	8 %	10 %	8 %	9 %	10 %
southern	4 %	3 %	9 %	9 %	9 %	9 %	9 %	3 %	2 %	3 %	3 %	5 %	3 %
Pupils teacher ratio	Basic pupils teacher ratio							Secondary pupils teacher ratio					
All Sudan	34	28	30	33	33	34	36	22	19	17	16	16	17
Northern	22	22	23	23	21	20	20	33	25	18	25	13	13
Khartoum	41	31	30	29	27	29	27	20	10	14	12	15	16
Central	28	28	26	27	29	31	30	21	22	15	17	15	16
Kordofan	59	31	34	36	36	36	41	22	30	24	21	21	22
Darfur	51	24	36	47	58	44	54	25	32	30	22	22	29
Eastern	34	31	33	34	34	39	31	27	23	17	18	18	16
Southern	39	39	39	43	46	45	76	16	28	15	15	10	26

Sources: Own calculation based on Sudan Ministry of Education, the Annual Educational Statistics Reports Various Issues (2001–2009): (2000–2001: 39–43, 50–52), (2001–2002: 67–70, 88–89), (2003–2004: 74–77, 97–99), (2004–2005: 77–80, 102–104), (2005–2006: 76–79, 97–98), (2006–2007: 79–82, 114–115), (2007–2008: 79–82, 115–116), (2008–2009: 100–103, 136–137)

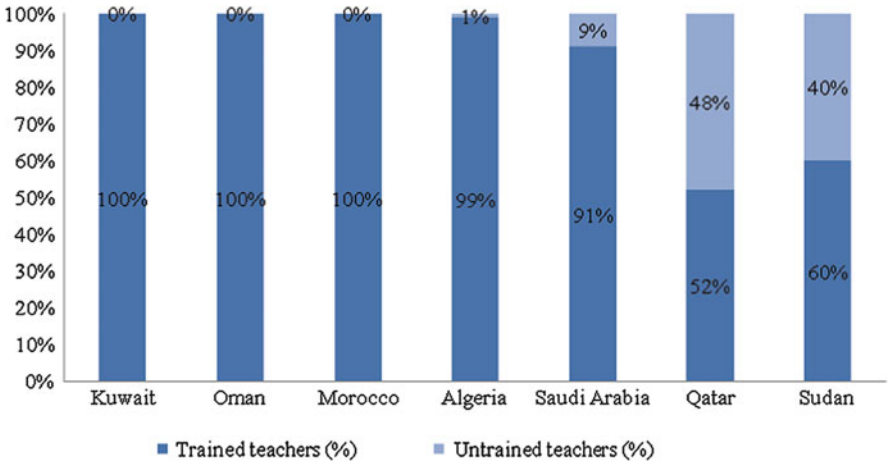

Fig. 9.7 Distribution of trained and untrained teachers ratios in basic education in Sudan as compared to Arab and Gulf countries (2008/2009) (Source: UNESCO Global Background information on Education Statistics: UNESCO- UIS Data Centre: Beyond 20/20 WDS (2011))

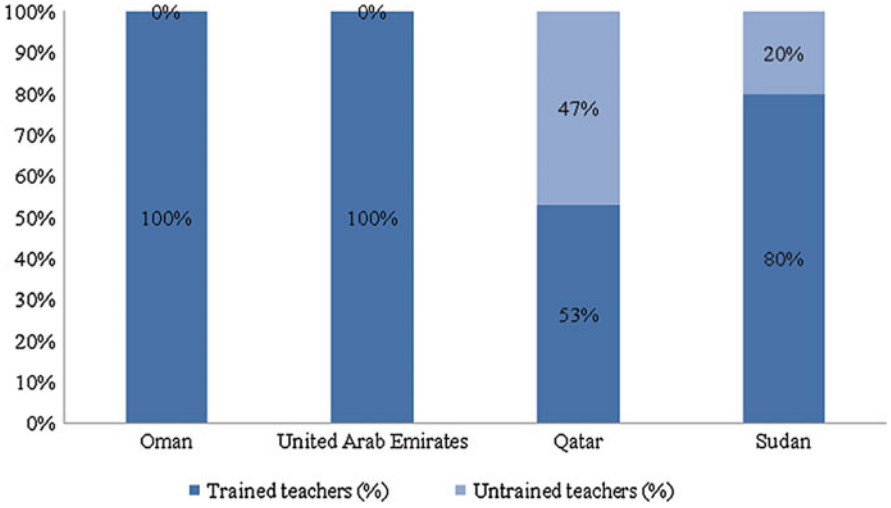

Fig. 9.8 Distribution of trained and untrained teachers ratios in secondary education in Sudan as compared to Arab Gulf countries (2008/2009) (Source: UNESCO Global Background information on Education Statistics: UNESCO- UIS Data Centre: Beyond 20/20 WDS (2011))

teaching and learning techniques".[12] For instance, Table 9.6 and Figs. 9.9, 9.10, 9.11, and 9.12 below investigate the lack of trained teachers and insufficiently trained teaching staff in basic, secondary, technical and tertiary education. For instance, over the period 2002–2008 the trained teachers are respectively 62 %, 60 %, 60 %, 66 % and 61 % of total teachers in basic education in 2002, 2005, 2006, 2007 and 2008 respectively. Moreover, in the period 2002–2009 the trained teachers are respectively 51 %, 66 %, 63 %, 67 % and 62 % of total teachers in secondary education in 2002, 2006, 2007, 2008 and 2009 respectively (see Table 9.6 below). The problem of the lack of trained teachers is more serious in the technical and basic education as compared to secondary and tertiary education, notably, for both basic and secondary education more than one third of teachers are untrained (see Tables 9.5 and 9.6 below). Moreover, we observe the lack of adequately trained teaching staff in tertiary education over the period 1996/97–2007/08. Although the share of total trained teachers in tertiary education improved and increased from 66 % in 1996/97 to 71 %, 75 %, 70 %, 77 % and 81 % in the years 1997/98, 2000/01, 2003/04, 2004/05 and 2007/08 respectively, the share of untrained teaching staff in tertiary education remained high and represents near to one fifth of total teaching staff in tertiary education in 2007/08. We observe the incidence of the sectoral gap in efficiency that appears as the share of trained teaching staff in the public universities is relatively high as compared to private universities and the incidence of the gender gap in efficiency that appears as the share of trained male teaching staff is relatively high as compared to female teaching staff; moreover, the observed gender gap in trained teaching staff in the private universities is higher than in the public universities over the period 2000/01–2007/08 (see Table 9.6 below).

In addition, from Tables 9.5 and 9.6 below we observe the low commitment to equity and incidence of wide regional disparity that appear from the share of the main regions in Sudan in terms of the adequacy and efficiency of human resources allocated to basic and secondary education as measured by the share in total number of teachers, pupils teachers ratios and the share in total number of trained teachers in basic and secondary education in Sudan over the period 2001–2009. For instance, we observe that the quantitative adequacy of teachers as measured by low pupil-teacher ratio is relatively better in the Northern region followed by Khartoum and the Central and Eastern regions as compared to Kordofan, Darfur, and Southern regions. Moreover, we observe the large share of the Central and Khartoum regions as compared to Northern, Kordofan, Darfur, Eastern and Southern regions in terms of quantitative adequacy of human resources, as measured by the share in total number of teachers and in terms of qualitative efficiency of human resources, as measured by the share in total number of trained teachers in basic and secondary

[12] See: Fahmey and Mahmoud (1993), pp. 29–30; Al-Sulayti (2002), pp. 29–30; Jalal al-Din (2002), pp. 12–13, 15–19, 22; and Suleiman (2007), pp. 117, 122–123. These findings are consistent with the observations of Suleiman (2007), who notes that currently a large number of teachers working in various stages of education without any training. See Suleiman (2007), p. 117.

Table 9.6 Regional distribution and share of main regions in trained and untrained teachers in basic and secondary education and the share of trained teachers in tertiary education defined by sector and gender in Sudan (1996/1997–2008) (%)

	Trained					Untrained				
(a) Basic	2002	2005	2006	2007	2008	2002	2005	2006	2007	2008
All Sudan	62 %	60 %	60 %	66 %	61 %	38 %	40 %	40 %	34 %	39 %
Northern	8 %	5 %	5 %	7 %	6 %	2 %	4 %	4 %	3 %	4 %
Khartoum	11 %	11 %	11 %	13 %	11 %	7 %	8 %	7 %	6 %	7 %
Central	17 %	19 %	19 %	22 %	20 %	13 %	10 %	10 %	6 %	9 %
Kordofan	9 %	7 %	7 %	7 %	6 %	4 %	5 %	5 %	5 %	5 %
Darfur	11 %	8 %	8 %	6 %	8 %	6 %	5 %	5 %	5 %	6 %
Eastern	5 %	6 %	6 %	3 %	2 %	2 %	3 %	4 %	4 %	5 %
southern	2 %	0.80 %	2 %			2 %	4 %	5 %	5 %	5 %
	Trained					Untrained				
(b) Secondary	2002	2006	2007	2008	2009	2002	2006	2007	2008	2009
All Sudan	51 %	66 %	63 %	67 %	62 %	49 %	34 %	37 %	33 %	38 %
Northern	6 %	5 %	5 %	7 %	6 %	2 %	3 %	2 %	2 %	4 %
Khartoum	18 %	18 %	25 %	20 %	16 %	10 %	8 %	10 %	9 %	13 %
Central	16 %	25 %	16 %	19 %	20 %	19 %	11 %	14 %	11 %	10 %
Kordofan	3 %	3 %	5 %	6 %	5 %	5 %	3 %	4 %	3 %	3 %
Darfur	5 %	7 %	6 %	8 %	7 %	5 %	2.30 %	3.50 %	4 %	2.30 %
Eastern	3 %	6 %	5 %	6 %	6 %	6 %	4 %	4 %	3 %	3 %
southern	0 %	3 %	3 %	3 %	3 %	3 %	1.80 %	1.60 %	3 %	3 %

(c) Tertiary	Trained						Untrained					
	1996/1997	1997/1998	2000/2001	2003/2004	2004/2005	2007/2008	1996/1997	1997/1998	2000/2001	2003/2004	2004/2005	2007/2008
All Sudan												
Total	66 %	71 %	75 %	70 %	77 %	81 %	34 %	29 %	25 %	30 %	23 %	19 %
Male	71 %	76 %	78 %	73 %	80 %	84 %	29 %	24 %	22 %	27 %	20 %	16 %
Female	52 %	55 %	64 %	58 %	71 %	75 %	48 %	45 %	36 %	42 %	29 %	25 %
Public												
Total			66 %	55 %	73 %	73 %			34 %	45 %	27 %	27 %
Male			83 %	72 %	81 %	83 %			17 %	28 %	19 %	17 %
Female			77 %	70 %	78 %	80 %			23 %	30 %	22 %	20 %
Private												
Total			65 %	64 %	67 %	64 %			35 %	36 %	33 %	36 %
Male			79 %	75 %	77 %	75 %			21 %	25 %	23 %	25 %
Female			75 %	71 %	73 %	71 %			25 %	29 %	27 %	29 %

Source: Own calculation based on Sudan Ministry of Education, the Annual Educational Statistics Reports Various Issues (2001–2009): (2001–2002: 30–31), (2003–2004: 34–37), (2004–2005: 32–35), (2005–2006: 31–34), (2006–2007: 31–34), (2007–2008: 33–36), (2008–2009: 58)

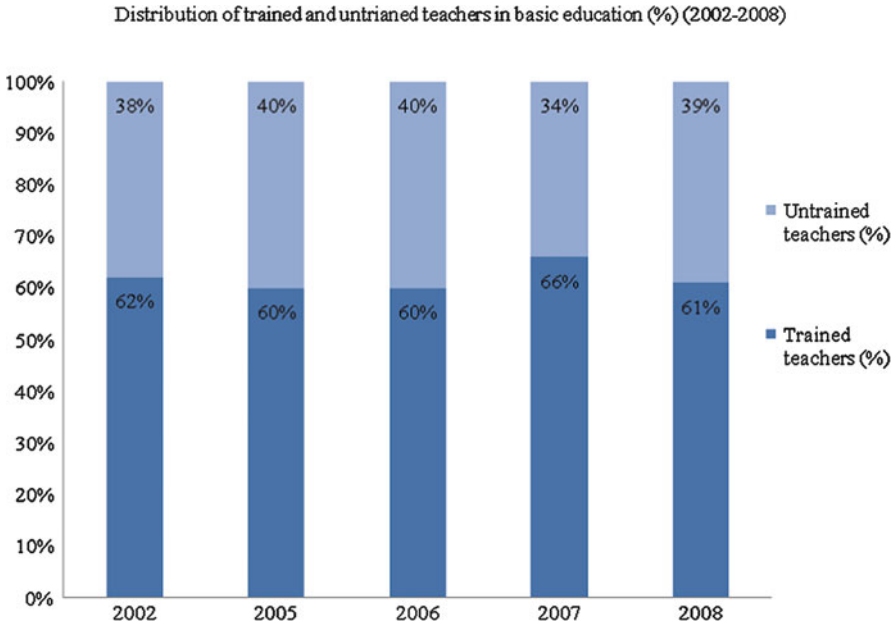

Fig. 9.9 Distribution of trained and untrained teachers in basic education in Sudan (%) (2002–2008) (Source: Own calculation based on Table 9.6)

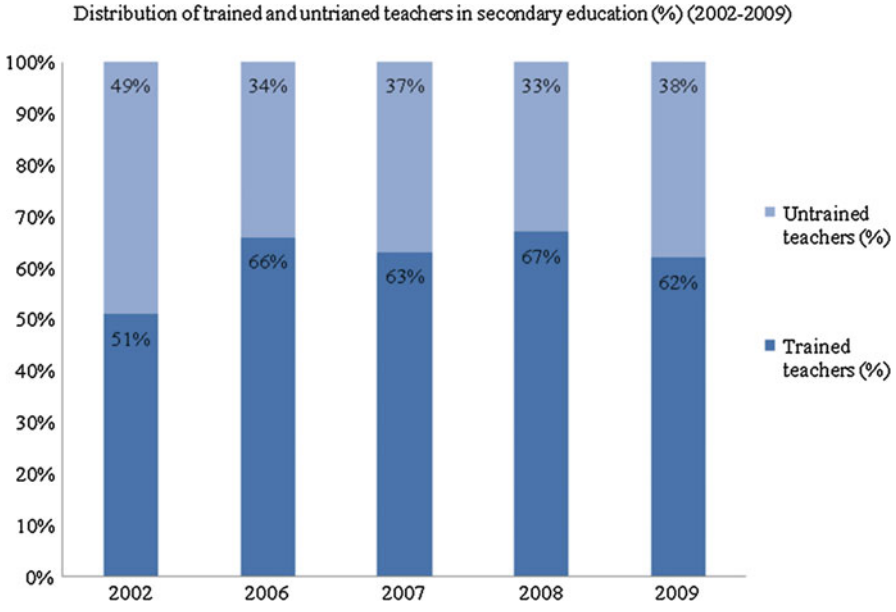

Fig. 9.10 Distribution of trained and untrained teachers in secondary education in Sudan (%) (2002–2009) (Source: Own calculation based on Table 9.6)

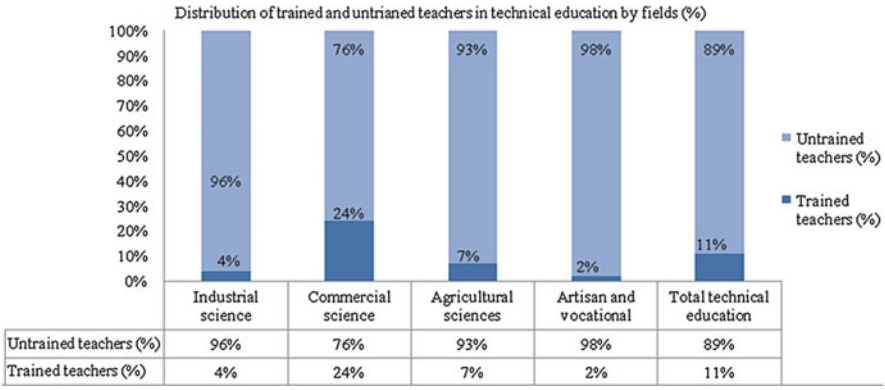

Fig. 9.11 Distribution of trained and untrained teachers in technical education in Sudan by fields (%) (Source: Own calculation based on Table 9.6. Adapted from Adapted from Table 9.2, p. 11)

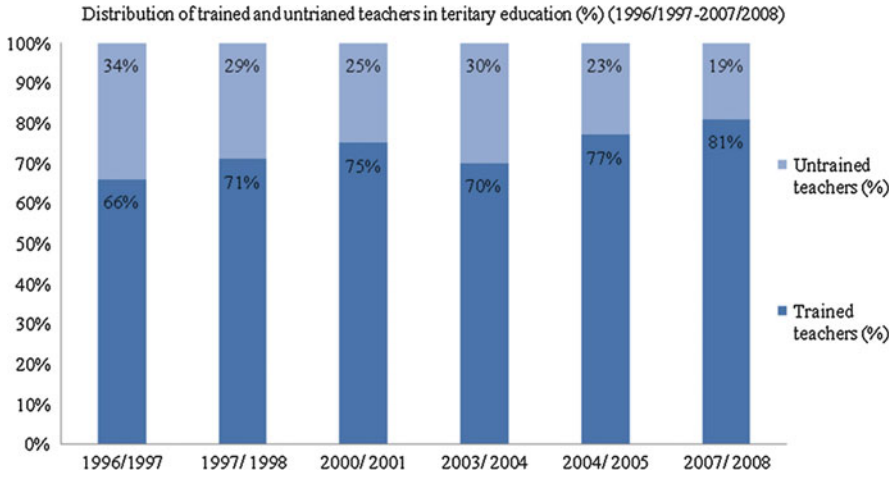

Fig. 9.12 Distribution of trained and untrained teachers in tertiary education in Sudan (%) (1996/1997–2007/2009) (Source: Own calculation based on Table 9.6)

education. This probably implies the low commitment to equity and the incidence of unbalanced regional distribution of trained human resources available for education, as measured by low pupils teachers ratios and large share in the total number of teachers and trained teachers for basic and secondary educational levels. These results may not be surprising in view of the fact that these regions also reported the large share in the financial investment and infrastructure on education as measured by the share in total numbers of basic and secondary schools over the period 2001–2009 as we explained above in this section.

9.2.3 *The Demand Side of Educational Policies: The Demand for and Enrolment in Education*

Apart from the supply side, it is also important to examine the demand for education as measured by enrolment ratios. Tables 9.7, 9.8, 9.9, 9.10, 9.11, 9.12, and 9.13 below shows that enrolment ratios vary across the main regions in Sudan, decline with the increase of education level and on average, lag behind the levels in Arab, Gulf and developed countries. The large quantitative increase in enrolment in higher education due to higher education revolution in 1990s should not hide the fact that at least until 2000/01 on average gross enrolment ratios in tertiary education in Sudan (6–6.9 %) remain low and fall behind the levels of the Arab (11.4–21 %), Gulf (21.4–24.8 %) and developed countries (58.4–94 %). That also holds for net enrolment ratios in primary and secondary education in Sudan that lag far behind those of the Arab, Gulf and developed countries.[13] A further serious problem is the negligence and declining trend in enrolment in vocational education in Sudan that falls behind Korea, Bahrain and developed countries (see Table 9.7 below). Thus, this implies low commitment to standardised international adequacy criterion in the demand side (or enrolment rate in primary, secondary and tertiary education).

Moreover, another problematic feature on the demand side of education in Sudan and Arab countries is the lack of incentives/minimal enrolment in private education compared to intensive enrolment in public education that is probably related to the high cost of private education and minimal contribution of the private

[13] Probably, the low enrolment at secondary level is attributed to high poverty rate, the high dropout in transition from primary to secondary schooling and the lack of effective actions in educational policy to legitimise compulsory education. For instance, Suleiman (2007) finds that the issue of free education, especially basic education has raised a lot of controversy in Sudan. He argues that in Sudan it is necessary to confirm the commitment for making basic education free and compulsory at the same time and it is the duty of the State to begin soon in the preparation of a plan for a period of 3 years or 5 years at most to achieve free and compulsory basic education, albeit gradually, with implementation to begin in the peripheral and poor regions that suffer from poverty. Other regions can be offered an alternative option of reduced fees that determined by school according to student family income level and the ability to pay for school fees; this can be an option or first step to achieve free education in Sudan in the long run. The plan should ensure that the schools do not have to be compelled to re-impose fees to pay salaries or other new expenses by provision of adequate ongoing or current funds necessary for the establishment and preparation of schools and teachers in light of rapid survey and assessment needs of the most needed states. If there is some shortage of school buildings, female students can be taught in the morning and male students in the afternoon, until a sufficient number of schools are available. Suleiman (2007) indicates that in the Interim Constitution of Sudan for the year 2005 (which is the Constitution that guarantees many rights for all citizens), the article 44 of it indicates that (1) "Education is a right for every citizen and the State to guarantee access to education without discrimination on the basis of religion, race, ethnicity, gender or disability "and (2)" Primary education is compulsory and the State shall provide it for free." He suggests cooperation of all people to the enforcement of this Constitution, especially as it is stated the rights of citizens. Suleiman (2007) argues that the education tuition fees and weak potential to get a job is likely paying much of today's youth to frustration and apathy. See Suleiman (2007), pp. 122–125.

Table 9.7 Enrolment ratios by educational level in the Sudan compared to Arab and world countries (1990–2008/2009) (%)

Educational level	Primary level[a, g]			Secondary level[a, g]			Tertiary level[a, b, e, g, i]			Tertiary students in Science, Math and Engineering[a, b, c, f, h]		Vocational education (1990–1995)[d]		
Year/ country	1990/ 1991[a]	2001/ 2002[a]	2008/ 2009[g]	1990/ 1991[a]	2001/ 2002[a]	2008/ 2009[g]	1998/ 1999[b]	2000/ 2001	2008/ 2009[g, i]	1994/ 1997[a, f]	1996[c(3)] – 2008[f(3), h (4)]	1990/ 1991[d]	2000[g]	2008/ 2009[g]
Sudan	43	46	74	24	18.2	38	6	6.9	5.9[i (1)]	27[f]	30[f] (3)	4.2	2	2
Bahrain	99	91	107	85	81	96	25.2	22	29.9i[(1)]	n/ a	18[h] (4)	13.3	17	16
Kuwait	49	85	95	n/a	77	90	21.1	22	17.6	23	27[c] (3)	0.6(5)	2	2
Oman	69	75	84	n/a	68	91	n/a	8.5	26	31	27[h] (4)	2.8	1.4	n/a
Qatar	89	94	106	70	78	85	27.7	24.6	10	n/a	23[h] (4)	2.9	2	1
KSA	59	59	99	31	53	97	0.71	22.4[(2)]	33	18	24[c] (3)	n/a	2 8	2.3
UAE	100	81	105	58	72	95	12.1	n/a	30	27	33[h] (4)	0.7	1	n/a
Average Gulf	77.5	80.8	99.3	61	71.5	92.3	21.4	18.5	24.8	24.5	25.3	3.9	4.4	5.3
US	97	93	99	85	85	94	75.7	72.6	83	n/a	15[h] (4)	n/a	n/a	n/a
Sweden	100	102	95	85	99	103	62.3	70	71	31	24[h] (4)	n/a	30	30
Korea	104	101	105	86	89	97	65[e]	77.6	98	34	32[h] (4)	18	19	12
UK	100	101	106	81	95	99	58.4	59.5	57	29	22[h] (4)	n/a	20	13
Finland	98	100	97	93	95	110	83[e]	85[e]	94	37	27[h] (4)	n/a	33	29
Arab	81.4	91	96	52.2	61	68	11.4	19	21	12.1	n/a	n/a	15	13

Notes: (1) Data refers to most recent available data between 2001 and 2009, (2) data refers to 1999/2000, (3) data refers to (%) of tertiary students in natural science, engineering, agriculture and medical sciences 1996 (4) data refers to (%) of tertiary graduates in natural science, engineering, agriculture and medical sciences 2008 (5) data refers to 1992/1993

[a]UNDP Human Development Report (2004).

[b]UNDP Human Development Report (2002).

[c]UNESCO–UIS (2000) UNESCO's World Education Report 2000 "The right to education: towards education for all throughout life".

[d]UNESCO (1996) Statistical Yearbook and UNESCO Statistics: www.unesco.org

[e]UNESCO- UIS (2004b) UIS web site global statistics on education: www.unesco.org

[f]Sudan Ministry of Education, the Annual Educational Statistics Reports Various Issues (2001–2009)

[g]UNESCO Global Background information on Education Statistics: UNESCO- UIS Data Centre: Beyond 20/20 WDS (2011)

[h]UNESCO-UIS (2010) "Global education digest 2010 Comparing education statistics around the e world"

[i]UNDP Human Development Report (2010).

Table 9.8 Regional distribution and share of main regions in total number of students enrolled in basic, secondary and tertiary education in Sudan (%) (1996–2009)

	(a) Basic education							(b) Secondary education						
Total	2001	2002	2004	2006	2007	2008	2009	2001	2002	2004	2006	2007	2008	2009
All Sudan	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Northern	8 %	8 %	7 %	7 %	6 %	5 %	5 %	10 %	6 %	9 %	8 %	8 %	8 %	7 %
Khartoum	21 %	21 %	19 %	15 %	16 %	16 %	15 %	29 %	33 %	24 %	23 %	28 %	27 %	26 %
Central	30 %	29 %	29 %	25 %	26 %	27 %	24 %	31 %	32 %	36 %	31 %	30 %	28 %	29 %
Kordofan	13 %	14 %	14 %	14 %	13 %	13 %	14 %	7 %	8 %	7 %	9 %	10 %	10 %	10 %
Darfur	14 %	14 %	14 %	17 %	19 %	19 %	18 %	10 %	9 %	12 %	17 %	11 %	16 %	14 %
Eastern	12 %	12 %	10 %	10 %	10 %	10 %	9 %	11 %	8 %	10 %	10 %	9 %	9 %	9 %
Southern	3 %	3 %	6 %	11 %	11 %	11 %	16 %	2 %	3 %	3 %	3 %	3 %	3 %	6 %

(c) Higher and tertiary education

Total	1996/1997	1998/1999	1999/2000	2000/2001	2001/2002	2002/2003	2004/2005	2005/2006	2006/2007	2007/2008	1996/2007
Northern	13.1 %	11.7 %	28 %	11.1 %	10 %	11.2 %	10.6 %	10 %	10.3 %	9.5 %	12.5 %
Khartoum	30.8 %	31.8 %	33.8 %	31.1 %	30.4 %	280 %	31.8 %	33.1 %	33.1 %	30.9 %	31.5 %
Central	35 %	35.5 %	32.9 %	33.9 %	32.6 %	29.8 %	30.5 %	30.2 %	29.2 %	30.4 %	32.1 %
Kordofan	5.9 %	4.8 %	4.1 %	4.9 %	6.6 %	6.6 %	5.2 %	6.2 %	6.5 %	7.5 %	5.8 %
Darfur	5.5 %	6.1 %	6.3 %	9.6 %	12 %	11.4 %	9 %	8.2 %	9 %	9.8 %	8.6 %
Eastern	8.4 %	8.9 %	8.4 %	7.4 %	6.7 %	7.8 %	8.5 %	8.1 %	7.4 %	7.7 %	7.9 %
Southern	1.4 %	1.17 %	1.7 %	2.2 %	2.7 %	3.9 %	4.2 %	4.4 %	4.4 %	4 %	3 %
Outside Sudan	0 %	0 %	0 %	0 %	0 %	0.1 %	0.2 %	0.2 %	0.2 %	0.2 %	0.1 %
All Sudan	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %

Sources: Own calculation based on (a–b) Sudan Ministry of Education, the Annual Educational Statistics Reports Various Issues (2001–2009): (2000–2001: 39–43, 50–52), (2001–2002: 67–70, 88–89), (2003–2004: 74–77, 97–99), (2004–2005: 77–80, 102–104), (2005–2006: 76–79, 97–98), (2006–2007: 79–82, 114–115), (2007–2008: 79–82, 115–116), (2008–2009: 100–103, 136–137), (c) Sudan Ministry of Higher education statistics on enrolment various issues reports (1996–2007).

Table 9.9 Regional distribution and share of main regions in total number of students enrolment rate in basic, secondary and tertiary education level defined by education levels and gender in Sudan (%) (2001–2009)

	2001			2006			2007			2008			2009		
(a) Basic	M	F	MF	M	F	MF	M	F	MF	M	F	MF	M	F	MF
All Sudan	57.4	49.3	53.4	69.8	59.3	64.5	72	60.3	66.2	73.9	63.4	68.7	67.4	64.6	66.1
Northern	94	90	92	98	91	95	91	82	86	93	84	89	88	86	87
Khartoum	88.4	83.7	86.1	83.2	79	81.1	85.5	81.6	83.6	88.8	88.5	88.6	91.5	95.9	93.7
Central	65	42	60	72	61	66	78	64	71	82	69	75	84	74	79
Kordofan	50	43	46	63	57	60	67	52	60	67	55	61	84	74	79
Darfur	45	33	27	65	46	56	46	51	60	69	56	62	67	60	64
Eastern	48	38	43	67	50	58	70	50	60	67	48	58	51	49	50
Southern	24	17	21	55	45	50	55	52	53	56	52	54	49	48	49
(b) Secondary															
All Sudan	18.1	18.4	18.2	26.2	25.3	25.7	26.9	25.7	26.3	29.6	26.3	28	29.4	29.9	29.7
Northern	39	52	45	45	52	49	42	48	45	46	52	49	46	53	49
Khartoum	35.7	40.8	38.1	44	50.6	47.4	52.9	56.4	54.6	54	55.8	54.9	62.1	68.9	65.4
Central	20	22	21	28	28	28	30	30	30	32	30	31	39	35	37
Kordofan	10	10	10	21	17	19	21	18	20	24	19	21	30	24	27
Darfur	14	9	12	24	18	21	18	12	15	26	15	20	22	18	20
Eastern	20	21	21	24	22	24	23	22	22	23	21	22	19	18	18
Southern	3	2	3	6	4	5	7	5	6	7	5	6	7	6	7

(continued)

Table 9.9 (continued)

	2001			2006			2007			2008			2009		
(a) Basic	M	F	MF	M	F	MF	M	F	MF	M	F	MF	M	F	MF
(c) Tertiary and higher education															
	2001/2002			2004/2005			2005/2006			2006/2007			2007/2008		
	M	F	MF	M	F	MF	M	F	MF	M	F	MF	M	F	MF
All Sudan	49.7	50.3	100	47.8	52.2	100	48	52	100	48.7	51.3	100	47.9	52.1	100
Northern	4.2	5.8	10	4.5	6.2	10.6	4.4	5.6	10	4.4	5.9	10.3	4		9.5
Khartoum	13.3	16.5	30.4	14.4	17.4	31.8	15	18.1	33.1	15.2	17.9	33.1	13.7	5.5	30.9
Central	15.7	17.1	32.6	14.5	16	30.5	14.5	15.8	30.2	14.2	15	29.2	14.4	16	30.4
Kordofan	3.4	3.2	6.6	2.6	2.7	5.2	3	3.2	6.2	3.3	3.3	6.5	3.6	3.9	7.5
Darfur	8.4	3.8	12	4.9	4.1	9	4.4	3.8	8.2	5.2	3.9	9	5.7	4.1	9.8
Eastern	3.5	3.2	6.7	4.1	4.4	8.5	3.8	4.1	8.1	3.5	3.8	7.4	3.6	4	7.7
Southern	2	0.9	2.7	3	1.4	4.2	3.1	1.4	4.4	2.9	1.6	4.4	2.7	1.5	4
outside Sudan	0	0	0	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.2

Sources: Own calculation based on (a–b) Sudan Ministry of Education, the Annual Educational Statistics Reports Various Issues (2001–2009), (c) Sudan Ministry of higher education educational survey statistics (2000–2001) cited in ministry of education educational statistics (2001–2002: 49)

Table 9.10 Regional distribution and share of main regions in total number of students enrolled in public and private basic and secondary schools and the share of students enrolled in public and private tertiary education institutions defined by gender in Sudan (1993/1994–2009) (%)

	Public						Private					
(a) Basic	2001	2002	2006	2007	2008	2009	2001	2002	2006	2007	2008	2009
All Sudan	95.6 %	95.2 %	96.4 %	96.0 %	93.8 %	95.7 %	4.4 %	4.8 %	3.6 %	4.1 %	6.2 %	4.3 %
Northern	8.0 %	7.9 %	6.5 %	5.9 %	5.5 %	3.3 %	0.2 %	0.2 %	0.1 %	0.1 %	0.2 %	0.1 %
Khartoum	19.9 %	19.4 %	13.9 %	13.8 %	13.9 %	13.0 %	1.0 %	1.6 %	1.5 %	1.9 %	1.9 %	1.9 %
Central	28.5 %	28.1 %	25.0 %	25.3 %	24.3 %	22.7 %	0.7 %	0.7 %	0.5 %	0.5 %	2.2 %	0.4 %
Kordofan	12.1 %	13.1 %	13.2 %	12.7 %	12.1 %	13.5 %	0.4 %	0.3 %	0.3 %	0.4 %	0.6 %	0.4 %
Darfur	13.8 %	13.1 %	17.3 %	17.4 %	17.8 %	17.2 %	0.6 %	0.9 %	0.7 %	0.6 %	0.8 %	1.0 %
Eastern	10.0 %	10.4 %	9.6 %	9.4 %	9.5 %	8.4 %	1.0 %	0.6 %	0.6 %	0.6 %	0.6 %	0.5 %
Southern	3.4 %	3.3 %	11.0 %	11.5 %	10.7 %	16.0 %	0.6 %	0.6 %	0.0 %	0.0 %	0.0 %	0.0 %
	Public						Private					
(b) Secondary	2001	2002	2006	2007	2008	2009	2001	2005	2006	2007	2008	2009
All Sudan	77.7 %	77.7 %	84.9 %	84.0 %	83.0 %	77.8 %	22.3 %	22.3 %	15.2 %	16.1 %	17.0 %	22.2 %
Northern	8.6 %	8.6 %	7.9 %	7.2 %	7.2 %	6.4 %	2.1 %	2.0 %	0.5 %	0.2 %	0.2 %	0.8 %
Khartoum	19.8 %	19.1 %	16.7 %	19.7 %	18.2 %	14.3 %	10.0 %	9.6 %	6.1 %	8.5 %	8.4 %	12.1 %
Central	25.1 %	24.6 %	28.0 %	28.0 %	26.2 %	26.1 %	6.7 %	6.4 %	1.5 %	2.6 %	2.6 %	3.1 %
Kordofan	6.8 %	7.0 %	8.9 %	9.2 %	9.2 %	8.5 %	0.3 %	0.5 %	0.6 %	1.0 %	1.2 %	0.9 %
Darfur	8.7 %	9.3 %	12.2 %	9.2 %	12.0 %	10.1 %	1.7 %	2.8 %	5.4 %	2.5 %	3.4 %	3.7 %
Eastern	7.3 %	7.7 %	8.2 %	7.7 %	7.1 %	6.5 %	2.8 %	2.5 %	1.2 %	1.2 %	1.1 %	1.6 %
Southern	1.4 %	1.4 %	3.1 %	2.9 %	3.0 %	6.0 %	0.4 %	0.4 %	0.0 %	0.0 %	0.0 %	0.0 %
	Public						Private					
(c) Tertiary	1993/1994	1995/1996	2001/2002	2002/2003	2005/2006	2007/2008	1993/1994	1995/1996	2001/2002	2002/2003	2005/2006	2007/2008
Male	89 %	93 %	83 %	98 %	92 %	94 %	11 %	7 %	17 %	2 %	8 %	6 %
Female	79 %	92 %	79 %	82 %	91 %	93 %	21 %	8 %	21 %	18 %	9 %	7 %
Total	84 %	92 %	81 %	83 %	91 %	93 %	16 %	8 %	19 %	17 %	9 %	7 %

Sources: Own calculation based on (a–b) Sudan Ministry of Education: the Annual Educational Statistics Reports Various Issues (2001–2009): (2000–2001: 29–38, 44–49), (2001–2002: 52–54, 63–66, 76–77, 82–83), (2003–2004: 59–62, 70–73, 83–85, 90–91), (2004–2005: 58–61, 73–76, 87–89, 94–96), (2005–2006: 61–64, 73–75, 85–86, 91–92), (2006–2007: 59–62, 75–78, 88–89, 94–95), (2007–2008: 62–65, 75–78, 88–89, 95–96), (2008–2009: 84–87, 96–99, 109–110, 116–117), (c) Sudan Ministry of higher education and scientific research: the Annual Educational Statistics Reports Various Issues (1993/1994–2007/2008)

Table 9.11 Regional distribution and share of main regions in technical and vocational education and training and ggraduates of the apprenticeship programmes in Sudan (1995–2009)

School[a]	Technical education								Vocational education			
	2001	2002	2004	2005	2006	2007	2008	2009	2001	2007	2008	2009
All Sudan	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Northern	14 %	16 %	19 %	15 %	9 %	12 %	12 %	14 %	18 %	13 %	12 %	12 %
Khartoum	15 %	17 %	17 %	19 %	14 %	17 %	18 %	16 %	24 %	20 %	21 %	19 %
Central	25 %	23 %	22 %	35 %	42 %	30 %	27 %	35 %	39 %	49 %	46 %	42 %
Kordofan	8 %	8 %	12 %	7 %	8 %	7 %	7 %	6 %	0 %	0 %	0 %	0 %
Darfur	19 %	18 %	15 %	14 %	11 %	13 %	14 %	10 %	6 %	4 %	6 %	8 %
Eastern	15 %	17 %	13 %	11 %	15 %	16 %	18 %	17 %	12 %	13 %	14 %	20 %
Southern	5 %	4 %	0 %	0 %	0 %	3 %	3 %	3 %	0 %	0 %	0 %	0 %
Students[a]	Technical education								Vocational education			
	2001	2002	2004	2005	2006	2007	2008	2009	2001	2007	2008	2009
Number of students												
All Sudan	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Northern	8 %	8 %	12 %	9 %	6 %	7 %	9 %	11 %	8 %	5 %	6 %	7 %
Khartoum	30 %	30 %	27 %	30 %	23 %	27 %	22 %	22 %	47 %	56 %	37 %	45 %
Central	23 %	24 %	30 %	31 %	45 %	24 %	26 %	25 %	26 %	25 %	41 %	27 %
Kordofan	4 %	4 %	7 %	7 %	6 %	8 %	8 %	8 %	0 %	0 %	0 %	0 %
Darfur	12 %	12 %	9 %	8 %	9 %	14 %	14 %	12 %	5 %	3 %	5 %	7 %
Eastern	19 %	19 %	14 %	12 %	12 %	16 %	17 %	18 %	14 %	9 %	10 %	14 %
Southern	3 %	2 %	0 %	0 %	0 %	3 %	3 %	3 %	0 %	0 %	0 %	0 %
Number of tecachers[a]												

	Technical education								Technical education				Vocational education
									Trained		Untrained		
	2001	2002	2004	2005	2006	2007	2008	2009	2008	2009	2008	2009	2009
All Sudan	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	86 %	59 %	14 %	41 %	100 %
Northern	8 %	8 %	10 %	10 %	10 %	10 %	8 %	3 %	8 %	8 %	0 %	9 %	17 %
Khartoum	28 %	28 %	29 %	39 %	25 %	16 %	15 %	83 %	15 %	18 %	0 %	0 %	18 %
Central	23 %	24 %	30 %	29 %	33 %	41 %	40 %	1 %	35 %	18 %	6 %	6 %	25 %
Kordofan	7 %	6 %	8 %	7 %	6 %	6 %	6 %	2 %	6 %	5 %	0 %	6 %	10 %
Darfur	17 %	17 %	21 %	14 %	12 %	11 %	16 %	0 %	13 %	7 %	2 %	6 %	12 %
Eastern	12 %	12 %	16 %	11 %	16 %	18 %	15 %	9 %	9 %	5 %	6 %	13 %	18 %
Southern	4 %	4 %	0 %	5 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %
Training and graduates of the apprenticeship programmes[b]													
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1995–2006
All Sudan	100	100	100	100	100	100	100	100	100	100	100	100	100
Khartoum	63.1	61.7	61.2	60.5	61	57.3	59.5	58.3	57.2	58.4	60.1	80.8	61.2
Central	18.1	19.3	15.5	16	24.9	24.2	22.8	19.8	22.1	21.1	21.4	0	19.1
Darfur	0	0	3.6	2.4	2.3	1.8	0.9	1.3	0.5	0	0	0	1
Kordofan	0	0	0	3.8	1.8	1.8	2.1	2.2	1.7	1.8	5.8	4.5	2.3
Eastern	18.7	19	19.7	17.4	10	11	12	14	13.9	12.8	2	0	11.9
Southern	0	0	0	0	0	0	0	0	0	0	2.1	2.9	0.4
Other	0	0	0	0	0	4	2.8	4.3	4.5	5.9	8.5	11.7	4

Sources: Own calculation based on

[a]Sudan Ministry of Education, the Annual Educational Statistics Reports Various Issues (2001–2009)

[b]Sudan Ministry of Labour (2006) "Statistics on enrolment and graduates for Training of the apprenticeship programmes over the period (1995–2006)," Unpublished Statistics, Department of registration and certificates, Secretariat General of apprenticeship programme, Sudan Ministry of Labour, Khartoum, Sudan.

Table 9.12 Regional distribution, share and value of main regions in urbanization, economic, MDGs, demographic and education indicators in Northern Sudan (2005–2009)

(a) Urbanization, economic and MDGs indicators[a, b]

	Urbanization [a]	Actual Per capita federal allocation [a]	Poverty[b]		MDG 2.3. Literacy rate of 15–24 years-olds[b]		
			Proportion of population below poverty line	Poverty gap ratio	Total	Men	Women
			MDG 1.1	MDG 1.2	(15–24)	(15–24)	(15–24)
	2005	2005	2009	2009	2009	2009	2009
Total			46.5	16.2	77	84	71
Northern	27	9068	33.7	9.4	88	91	86
Khartoum	88	8497	26	6.4	94	96	92
Central	29	4872	45.4	13.8	77	84	70
Kordufan	29	3765	58.7	23.1	69	79	61
Darfur	20	2732	62.7	24.6	74	85	64
Eastern	43	2553	46.3	17.7	63	68	57

(b) Education and demographic indicators[b, c, d]

	Net enrolment rate in primary education[b]	Primary education[c]		Secondary education[c]		Tertiary education[d]		Female enrolment		
		Students (6–13)	Population (6–13)	Students (14–16)	Population (14–16)	Students (16–20)	Population (16–20)	Primary[c] (6–13)	Secondary[c] (14–16)	Tertiary[d] (16–20)
	2009	2008	2008	2008	2008	2008	2008	2008	2008	2008
Total	67	100 %	100 %	100 %	100 %	100 %	100 %			
Northern	83	5 %	4 %	7 %	4 %	9.5	4.5 %	84 %	52 %	9.5 %
Khartoum	85	15 %	10 %	26 %	12 %	30.9	13.6 %	88.5 %	55.8 %	30.9 %
Central	67	38 %	29 %	29 %	19 %	30.4	19.3 %	69 %	30 %	30.4 %
Kordufan	60	14 %	12 %	9 %	10 %	7.5	10.1 %	55 %	19 %	7.5 %
Darfur	62	18 %	22 %	14 %	21 %	9.8	20.0 %	56 %	15 %	9.8 %
Eastern	57	9 %	12 %	8 %	12 %	7.7	12.2 %	48 %	21 %	7.7 %

[a]Elbadawi and Suleiman (2008: 107)
[b]the Sudan Central Bureau of Statistics (2011: 12)
[c]own calculation based on Sudan Ministry of Education, the Annual Educational Statistics Reports (2008/2009)
[d]own calculation based on Sudan Ministry of higher education statistics (2007/2008)

Table 9.13 Correlation between education indicators, urbanization, MDG, demographic and economic indicators in Northern Sudan (2005–2009)

	Coefficient (t-value)						R^2	N
Independent Variable	Proportion of population below poverty line	Poverty gap ratio	Per capita income	Urbanization	Share of population (2008)	Constant		
Dependent variable	MDG 1	MDG12						
Enrolment in basic education (MDG2:)	−0.993**					111.881	0.707	6
	(−3.103)					(7.403)		
		−2.000**				98.419	0.775	6
		(−3.717)				(10.642)		
			0.007**			37.278	0.938	6
			(7.801)			(8.831)		
				0.260*		58.780	0.289	6
				(1.274)		(6.339)		
					1.163**	−0.008	0.836	6
					(4.516)	(−0.172)		
Enrolment in secondary education	−0.002					0.258	0.108	6
	(−0.697)					(1.684)		
		−0.006				0.242	0.172	6
		(−0.910)				(2.341)		
			0.00001			0.116	0.048	6
			(0.448)			(1.209)		
				0.002		0.086	0.204	6
				(1.014)		(1.102)		
					0.844*	0.045	0.294	6
					(1.289)	(0.488)		
Enrolment in tertiary education	−0.445*					36.205	0.301	6
	(−1.313)					(2.261)		
		−0.970*				31.326	0.387	6
		(−1.588)				(2.985)		
			0.002			7.186	0.177	6

(continued)

Table 9.13 (continued)

	Coefficient (t-value)						R^2	N
			(0.926)			(0.678)		
				0.267*		5.460	0.342	6
				(1.442)		(0.648)		
					84.099	4.796	0.185	6
					(0.951)	(0.379)		
Female enrolment in basic education	−0.754*					101.039	0.407	6
	(−1.658)					(4.703)		
		−1.415*				88.798	0.383	6
		(−1.575)				(5.835)		
			0.006**			37.278	0.938	6
			(7.801)			(8.831)		
				0.347*		53.103	0.272	6
				(1.223)		(4.116)		
Female enrolment in secondary education	−0.640					61.261	0.262	6
	(−1.192)					(2.412)		
		−1.213				51.042	0.251	6
		(−1.157)				(2.874)		
			0.006**			0.687	0.952	6
			(8.917)			(0.174)		
				0.434*		15.059	0.380	6
				(1.565)		(1.194)		
Female enrolment in tertiary education	−0.693**					47.517	0.731	6
	(−3.300)					(4.783)		
		−1.268**				35.727	0.652	6
		(−2.736)				(4.551)		
			0.002			7.186	0.177	6
			(0.926)			(0.678)		
				0.267*		5.460	0.342	6

				(1.442)	(0.648)		
Female literacy rate	−0.858**				110.689	0.723	6
	(−3.229)				(8.813)		
		−1.692**			98.449	0.759	6
		(−3.547)			(12.012)		
			0.005**		46.620		
			(11.888)			0.927	6
(7.137)							
Male literacy rate	−0.382*				101.200	0.304	6
	(−1.323)				(7.417)		
		−0.806*			96.591	0.366	6
		(−1.520)			(10.600)		
			0.003**		69.303	0.663	6
			(2.807)		(11.981)		
Total population literacy rate MDG 2	−0.636**				106.409	0.591	6
	(−2.404)				(8.514)		
		−1.277**			97.714	0.644	6
		(−2.689)			(11.978)		
			0.004**		57.778	0.857	6
			(4.885)		(12.808)		

Correlation is significant
*at the 0.05 level (one-tailed)
**at the 0.01 level (one-tailed)

sector in total spending on education compared to the public sector. Enrolment in private education in Sudan is low and falls below the level in some Arab Gulf countries that probably attributed to high poverty rate in Sudan (see Figs. 9.13, 9.14, 9.15, 9.16, and 9.17 below). Similar to public enrolment, private enrolment ratio increases with the increase of educational level, i.e. are higher at secondary level, followed by tertiary level and lower at primary level. It is worth noting that despite the tremendous spread of private education institutions and despite great regional disparity in private enrolment in basic, secondary and tertiary education, private primary, secondary and tertiary enrolment ratios have not shown a large increasing trend over time in Sudan (see Table 9.10 and Figs. 9.18, 9.19, and 9.20 below).[14] Somewhat surprising we observe that different from the large share and increasing trend in the supply side as measured by the share of private sector in total number of higher education institutions, by contrast, the demand side as measured by the share of student enrolment in private higher education shows opposite declining trend and small share in Sudan over the period 1993/94–2007/08 (see Fig. 9.20 below).

Furthermore, we find evidence of the low commitment to the standardised international equity criterion in the demand side that appear in terms of the gender differences in educational attainment as measured by the gross enrolment ratio of female for primary, secondary and tertiary education. For instance, Fig. 9.21 and Tables 9.9 and 9.12 below illustrate that the percentages of female students for all levels of education in Sudan are lower than male students and both are low compared to the average for the Arab countries. For Sudan, female enrolment in secondary education is better than primary education, which implies that the gender

[14] The scarcity of reliable information limited our analysis from discussing two interesting issues related to educational policies: the contribution of private sector in both spending and enrolment in tertiary education; and the enrolment of the citizens from Sudan in overseas educational institutions. Due to the long-term low GDP per capital and high poverty rate a few number of citizens from Sudan have been able to seek higher education abroad; this is apparent from the very limited information documented from a few sources such as the UNESCO and UNDP reports. For instance, according to UNESCO-UIS (2007–2010), 'Global education digest 2007–2010: comparing education statistics around the world', for Sudan, figures on international flows of mobile students (2005–2008) indicate that the gross outbound enrolment ratio is stagnant and estimated at about 0.1, whereas students from Sudan studying abroad (outbound mobile students) was about 3,197, 3,153, 2,793 and 2,792 in 2005, 2006, 2007 and 2008 respectively. The report indicates that the top five destinations (host countries) for outbound mobile students (the number of students from given country studying in the host countries is shown in brackets) are Malaysia (507), Germany (460), UK (339), Saudi Arabia (334) and Australia (313) in 2005; Malaysia (572), USA (320), Saudi Arabia (313), Australia (313) and UK (302) in 2006; Malaysia (479), UK (343), USA (328), Saudi Arabia (313) and Germany (247) in 2007; Malaysia (634), UK (347), USA (224), Germany (209) and Qatar (137) in 2008. See UNESCO-UIS (2007–2010), 'Global education digests 2007–2010'. Moreover, the only available information indicates that during the period 2000/2001–2006/2007, the number of students from Sudan who study in the US declined by 12 % from 366 in 2000–2001 to 321 in 2006–2007. See 'Arab Knowledge Report' (2009), p. 300. This result is consistent with the results from the Arab Gulf countries which indicate that during the period 1999–2002/2003 students from Saudi Arabia, Qatar and Oman who study in the United States declined by 31 %, 26 % and 25 % respectively. See the UNDP-AHDR (2003), Table 9.1, p. 23. This may substantiate the need for improving domestic higher educational institutions to fill the gap and absorb the students who have returned.

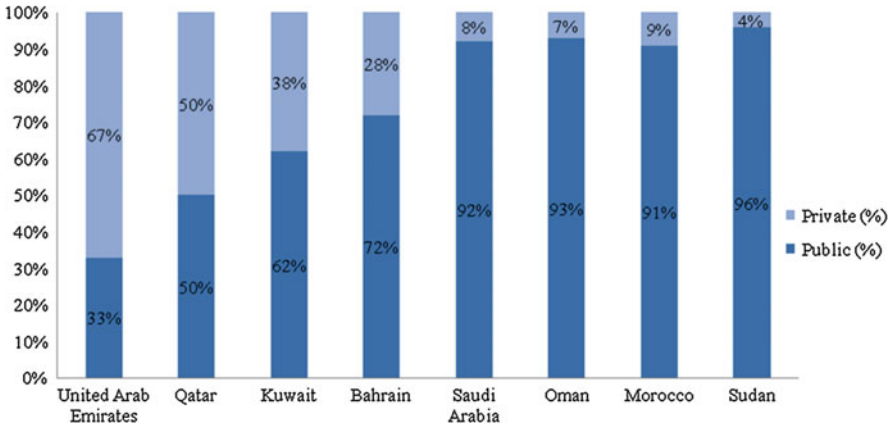

Fig. 9.13 Distribution and share of students' enrolment in public and private basic education in Sudan as compared to Arab and Gulf countries (%) (2008–2009) (Source: UNESCO Global Background information on Education Statistics: UNESCO- UIS Data Centre: Beyond 20/20 WDS (2011))

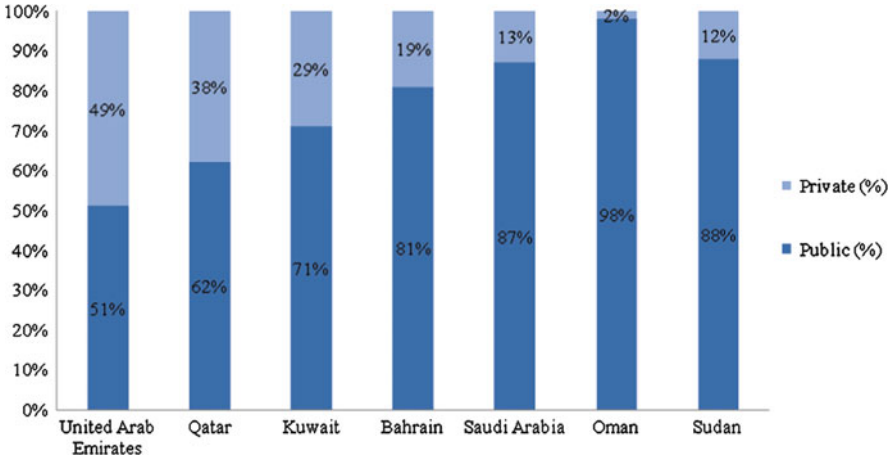

Fig. 9.14 Distribution and share of students' enrolment in public and private secondary education in Sudan and Gulf countries (%) (2008–2009) (Source: UNESCO Global Background information on Education Statistics: UNESCO- UIS Data Centre: Beyond 20/20 WDS (2011))

gap in primary education is higher than in secondary education. We observe the differences in the regional distribution in the incidence of the gender gap across the main regions in Sudan, which probably implies that the presence of gender disparity in primary education, as the gross intake and enrolment rate for females falls below the gross intake and enrolment rate of males in all regions. For secondary and tertiary education, gender disparity exists for the most poor and rural regions as the gross intake and enrolment rate for females falls behind the enrolment rate of males, by contrast for all Sudan and for relatively more urbanised and less poor regions,

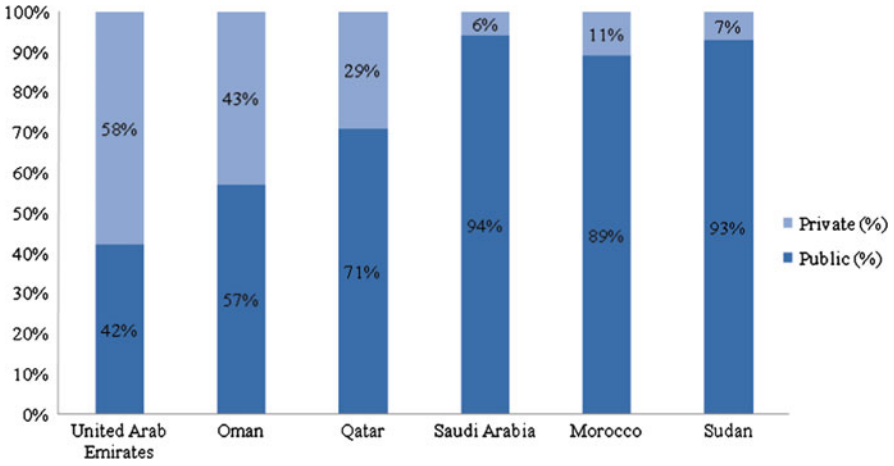

Fig. 9.15 Distribution and share of students' enrolment in public and private tertiary education in Sudan and Arab countries (%) (2007–2009) (Source: UNESCO Global Background information on Education Statistics: UNESCO- UIS Data Centre: Beyond 20/20 WDS (2011))

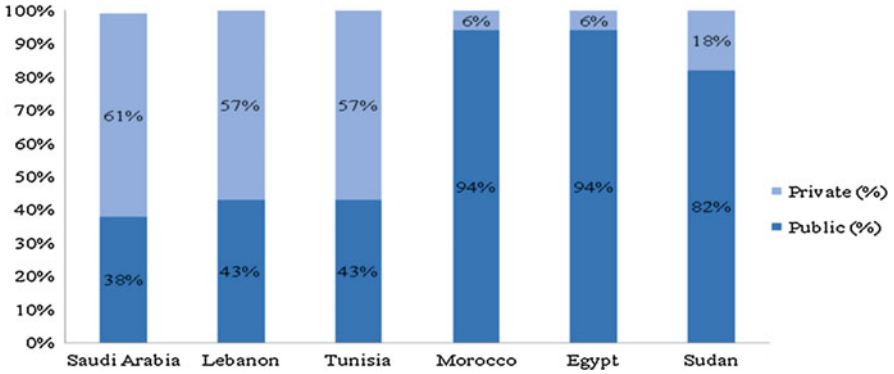

Fig. 9.16 Distribution and share of students' enrolment in public and private technical education in Sudan and Arab countries (%) (2008–2009) (Source: UNESCO Global Background information on Education Statistics: UNESCO- UIS Data Centre: Beyond 20/20 WDS (2011))

the gross intake and the percentage of enrolment rate for females is greater than the enrolment rate of males (see Tables 9.12 and 9.13 below). This implies that gender disparity and gap is more critical for more poor and rural regions and population groups, i.e. poor females and females living in rural areas are facing a serious situation of inequality and are suffering more in terms of net attendance or access to primary and secondary education in Sudan. Somewhat surprisingly, the gender disparity is more serious in primary education compared to secondary education, especially for poor females; this is consistent with the findings based on the data

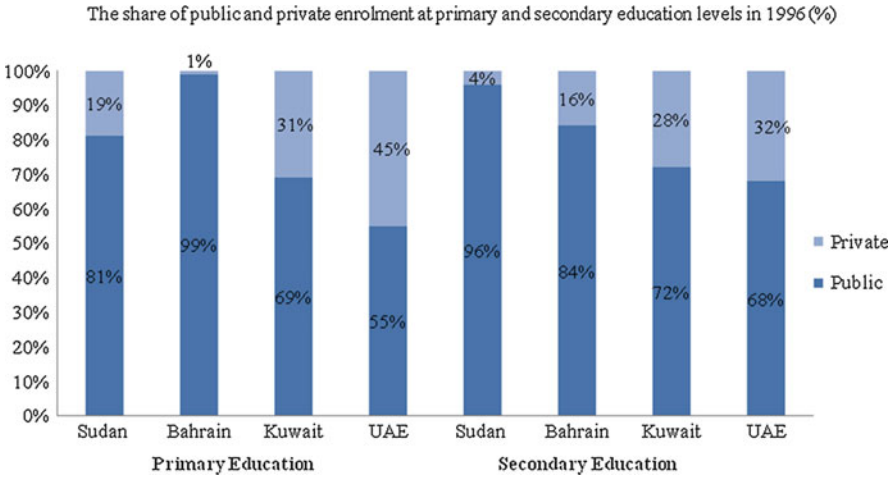

Fig. 9.17 Distribution and share of students' enrolment in public and private basic and secondary education in Sudan and Gulf countries (%) (1996) (Source: UNESCO Global Background information on Education Statistics: UNESCO- UIS Data Centre: Beyond 20/20 WDS (2011))

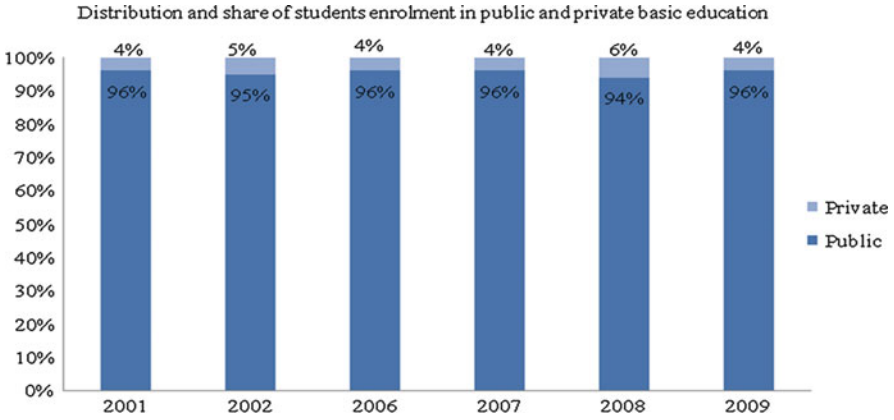

Fig. 9.18 Distribution and share of students' enrolment in public and private basic education in Sudan (2001–2009) (Source: Own calculation based on Table 9.10)

from UNESCO (2006), which we presented in Nour (2011). This implies that, especially amongst the poor, economic reasons were considered to be the most important factor limiting girls' potential to complete their primary (basic) and secondary school education and that the factors preventing males from completing their education differ from those hampering females. It is clear from Tables 9.9, 9.12, and 9.13 below that family economic problems impact more negatively on female than on male education. Likewise, families perceive educating girls to be

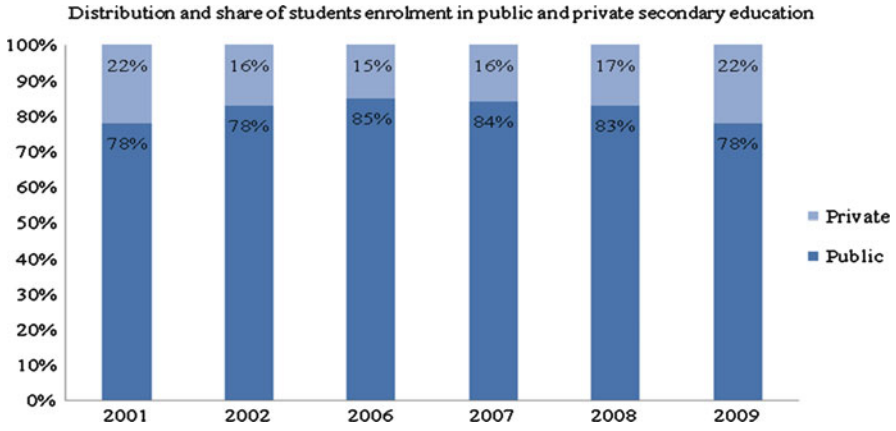

Fig. 9.19 Distribution and share of students' enrolment in public and private secondary education in Sudan (2001–2009) (Source: Own calculation based on Table 9.10)

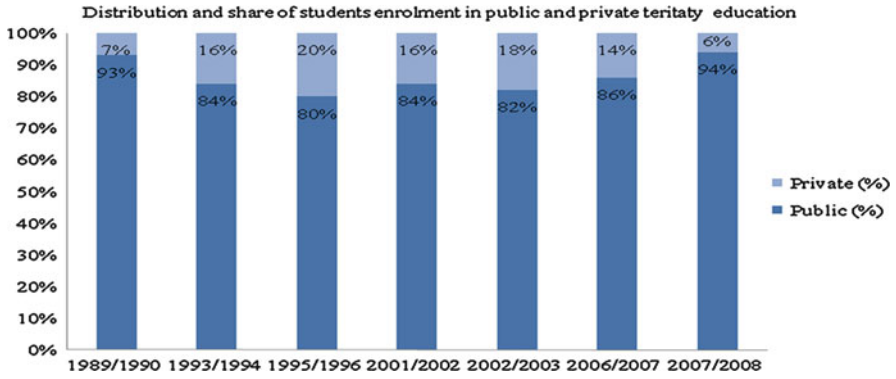

Fig. 9.20 Distribution and share of students' enrolment in public and private tertiary education in Sudan (1989/1990-2007/2008) (Source: Own calculation based on Table 9.10)

less important than schooling boys. It is the need to work that has the largest effect on the withdrawal of boys from school. It is worth noting that despite the tremendous spread of female education in the last five decades, Sudanese women remain poorly prepared to participate effectively and fruitfully in public life by acquiring knowledge through education. This is most clearly manifested in the extent to which girls and women are still deprived of education and knowledge, especially those forms of knowledge that bring high social returns. Sudan has one of the world's lowest rates of female enrolment opportunities at all levels of education, especially higher education. Female access to all levels of education remaining below that of males implies further evidence on the incidence of relatively higher deprivation of girls in terms of educational opportunities at all levels in Sudan. Sudan has one of the highest rates of illiteracy approximately near to one half of

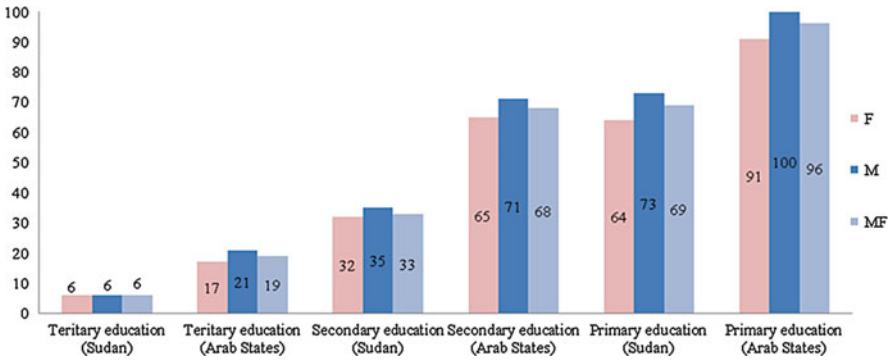

Fig. 9.21 Enrolment ratios in basic, secondary and tertiary education in Sudan compared to the average for the Arab countries defined by educational level and gender (2000) (%) (Source: Arab Knowledge Report (2009: 279))

females are illiterate compared to only one third of males.[15] Moreover, data and information from the Sudan Ministry of Education and Ministry of Higher Education provide further evidence for the incidence of gender gap in education as measured by enrolment of students in primary (basic), secondary and tertiary education (measured by students nominated and admitted for governmental, private and foreign higher education institutes) over the period (2004–07). For instance, the gender gap for basic (primary) education is higher than for secondary and tertiary education. The incidence of gender gap in tertiary education as measured by the share of female students enrolled or admitted in tertiary education in public and governmental higher education institutes is higher than that for private and foreign higher education institutes in 2005. The high share of female students compared to male students in tertiary education, can be interpreted in relation to the observation from the preliminary findings of the Sudan Central Bureau of Statistics on Sudan's fifth population census which indicate that the structure of Sudan's total population according to different age groups implies that for the age group 20–39 the total number of females is slightly higher than the total number of males. Another justification is probably because of the presence of male Sudanese studying abroad (Nour 2011: 7–10). Therefore, these findings imply low commitment to the standardised international adequacy and equity criterions in the demand side as measured by the lack of adequacy and gender equity in enrolment rate in primary, secondary and tertiary education and literacy rate of population.

In addition we observe that the low commitment to equity criterion and the incidence of wide gap and regional disparity between the main regions in Sudan is not only limited to the supply side but also holds for the demand side. For instance, Tables 9.8, 9.9, 9.10, 9.11, 9.12, and 9.13 below indicate the incidence of regional disparity that appear from the share of main regions in total number of students

[15] See for instance, AHDR (2004), pp. 73–74.

enrolment in basic, secondary and tertiary education in Sudan over the period 2001–09. For instance, we observe the large share of the Central and Darfur regions followed by Khartoum in total numbers of students enrolled in basic education, and the large share of the Central and Khartoum regions followed by the Darfur region in total numbers of students enrolled in secondary education as compared to Kordofan, Eastern, Northern and Southern regions over the period 2001–09. Moreover, we note the large share of the Central and Khartoum regions followed by the Northern region as compared to Darfur, Eastern, Kordofan and Southern regions in terms of the total numbers of students enrolled in tertiary education over the period 1996–2007. Moreover, we observe the heavy concentration of privatisation in Khartoum region that has the highest share in terms of total number of student enrolment in private basic and secondary schools as compared to other regions. This low commitment to equity criterion and the incidence of unbalanced distribution in the demand side as measured by the distribution and share of student enrolment in total and in public and private basic, secondary and tertiary education levels can be perceived as an implication that is consistent with the share of these regions in total number and public and private schools in basic and secondary education as we explained above in this section. This probably implies that the low commitment to equity criterion and the incidence of unbalanced development planning and unbalanced distribution in the supply side and investment as measured by the number of schools, number of teachers and the pupil/teacher ratios for basic and secondary educational levels that probably led to further implications in the demand side as measured by the distribution and share in total number of student enrolment in public and private schools and in basic, secondary and tertiary educational levels as we explained above in this section. Moreover, using the ordinary least squares method and E-VIEWS, Tables 9.8, 9.9, 9.10, 9.11, 9.12, and 9.13 below explain that it is probably plausible to interpret the observed regional disparity in the share in demand and enrolment in education due to demographic reasons (measured by the share in total population), economic reasons (measured by per capita income and poverty rate) and other reasons (measured by the degree of urbanisation) across the main regions in Sudan. Starting with the demographic reasons, Table 9.13 indicates significant positive correlation between the share in enrolment in basic and secondary education and the share in total population and positive correlation between enrolment in tertiary education and the share in total population. These results can be used to argue that the share in total population seems to be the first important factor determining the share and regional disparity in enrolment in education. Moreover, as for the economic reasons, Table 9.13 indicates significant positive correlation between per capita income and total, female and male literacy rates, between per capita income and enrolment in secondary and tertiary education and female enrolment in tertiary education, and also significant positive correlation between per capita income and enrolment in basic education and female enrolment in basic and secondary education. In addition, Table 9.13 indicates significant negative correlation between poverty rate and total, female and male literacy rates, significant negative correlation between poverty rate and total and female enrolment in basic and tertiary education

and negative correlation between poverty rate and total and female enrolment in secondary education. These results can be used to argue that the economic reasons as measured by per capita income and poverty rate seem to be the second important factor that determining the share and regional disparity in enrolment and demand for education. Notably, our results imply that the incidence of high poverty rate seems to be the most important factor determining or limiting the demand and enrolment, notably, in basic education. These findings imply that especially among the poor regions, economic reasons were considered to be the most important factor limiting poor students and especially, girls' potential to complete their primary (basic), secondary and tertiary education and that region economic problems impact more negatively on female than on male education. These results imply that the increase in the incidence of poverty and the low per capita income limited or led to low demand and enrolment in education, notably, across the poor regions and this probably explains the regional disparity in the demand for education across the main regions in Sudan. In addition, as for the other reasons, Table 9.13 indicates positive correlation between enrolment in secondary education and degree of urbanisation, significant positive correlation between enrolment in basic and tertiary education and degree of urbanisation and between female enrolment in basic, secondary and tertiary education and the degree of urbanisation. These findings can be used to argue that the degree of urbanisation is the third and other factor determining the share and regional disparity in enrolment in education. The major policy implication from our findings is that Sudan has the potential to achieve equity and fulfil the second and third United Nations Millennium Development Goals (UN MDG) on universal access to primary education and gender equality respectively through reduction and elimination of poverty, notably, across the poor regions and population in Sudan, and this implies achievement of equity and international commitment to fulfilment of UN MDG in Sudan.

Moreover, we observe the low commitment to equity criterion and the incidence of regional disparities in terms of technical and vocational education. For instance, the Central and Khartoum regions followed by Eastern region as compared to the Northern, Darfur, Kordofan and Southern regions respectively show the large share in total number of schools, students, total number of teachers and trained teachers in technical and vocational education in Sudan over the period 2001–09. In addition, Khartoum and the Central region followed by the Eastern region as compared to Kordofan, Darfur and Southern regions respectively show the large share in total number of trained and graduated students of the apprenticeship programmes and vocational training in Sudan over the period 1995–2006. This probably implies the low commitment to equity criterion and the incidence of regional disparity and unbalanced distribution of trained human resources available for technical and vocational education. That may not be surprising in view of the fact that these regions also reported the large share in total numbers of basic, secondary and tertiary education over the period 2001–09 as we explained above in this section.

One major problem of the educational system in Sudan and the Gulf countries is the recent serious deterioration in the quality of tertiary education; for instance, after considerable improvement and increase in enrolment in tertiary education in

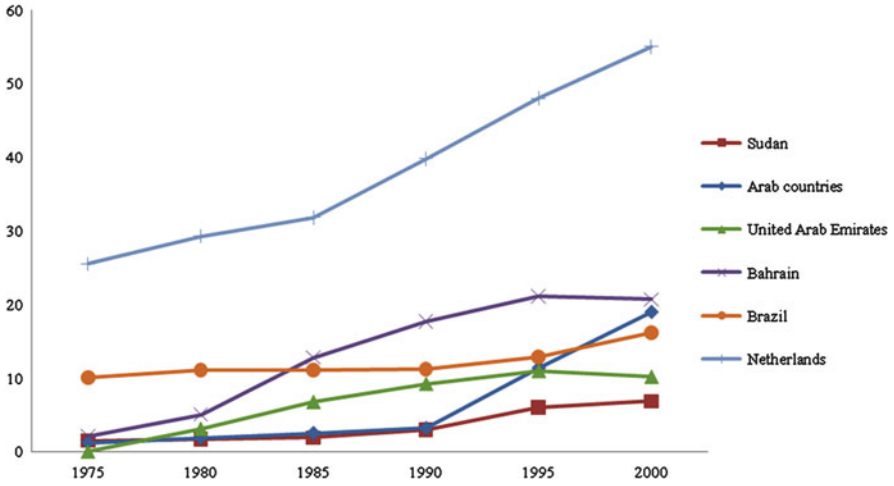

Fig. 9.22 Gross enrolment in tertiary education in the Sudan, UAE, Bahrain, Brazil and the Netherlands (1975–2000) %) (Source: WDI (2004) Database)

Sudan until around 1995 – after the higher education revolution in 1990s – while the gross enrolment figures have increased, the net enrolment ratio of the number of tertiary students of official tertiary education age who are enrolled in tertiary education to the total population of students remains low and below the international standard and also the quality has deteriorated in recent years (see Fig. 9.22 below). Therefore, this implies an ample role for policymaking to improve the quality and enrolment in tertiary education. In addition, as in most other developing countries, one serious problematic feature concerning tertiary education in Sudan and the Gulf is that enrolment and graduation ratios in tertiary education are biased against scientific, technical, engineering, agriculture, medical and natural sciences and are focused on art, humanities, law and social sciences. For instance, in the period 2009–10, enrolment and graduation ratios in medical sciences, natural sciences, engineering and agriculture accounted for only 30 % as compared to 70 % for art, humanities, law and social sciences; these biases remained for enrolment and graduation rates in the period 1994–2009 (see Table 9.7 above).[16]

[16] "The irrelevant wrong policy for admission in higher education leads to focus on humanities and social science and biases against science, technology and engineering studies leads to mismatch, unemployment, shortage of technical skills that leads to dependence on foreign technical skills". See Al-Sulayti (2002), pp. 16–18; Jalal al-Din (2002), pp. 7–10, 15, 23–24; Almagzoub (2007/08); Al-Tuhami (2008), pp. 2–12; Mohammed (2008), pp. 12, 2–20; Ismail (2008), pp. 2–19. "The low share of enrolment in technical education relative to total enrolment in tertiary education is probably attributed to both social/cultural aspect in the society that discourage the involvement in technical work and the weak relationship between educational policies and development planning". See Alfakhery (1999), p. 82; Jalal al-Din (2002), pp. 7, 20; Almagzoub (2007/08); Al-Tuhami (2008), pp. 2–12; Mohammed (2008), pp. 12, 2–20; Ismail (2008), pp. 2–19.

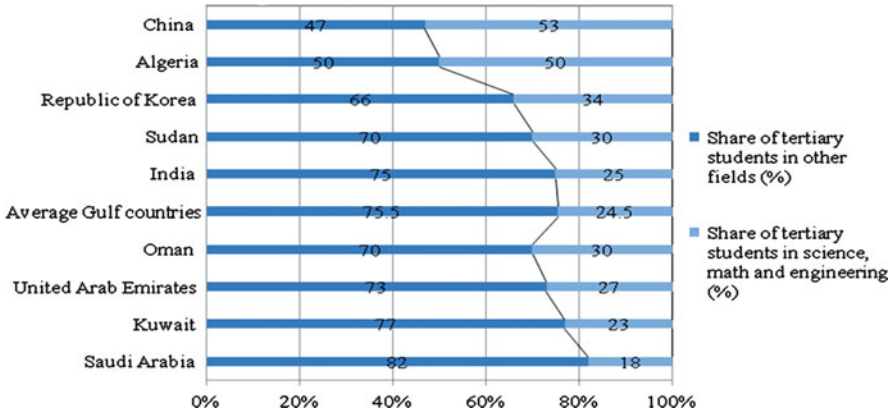

Fig. 9.23 Relative distribution of tertiary education students (%) by fields in the Sudan compared to the Gulf countries, Algeria, India, China and Korea (1994/1997- 2009/2010) (Source: UNDP (2004), UNDP – AHDR (2003) and UNESCO-UIS (2003): UNESCO web site (www.unesco.org))

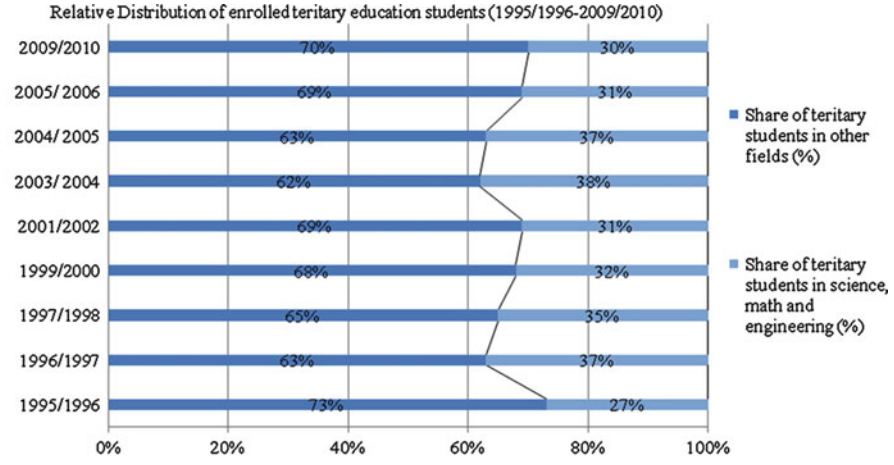

Fig. 9.24 Relative distribution of enrolled tertiary education students (%) by fields in the Sudan (1996/1997- 2009/2010) (Source: Own calculation based on Sudan Ministry of Higher Education and Scientific Research, the Annual Educational Statistics Reports Various Issues (1993/1994–2008/2009))

The share of tertiary students enrolled in sciences, math and engineering in Sudan and the Gulf is low compared to Korea (34 %), Algeria (50 %) and China (53 %) (see for instance, Figs. 9.23, 9.24, and 9.25 below).

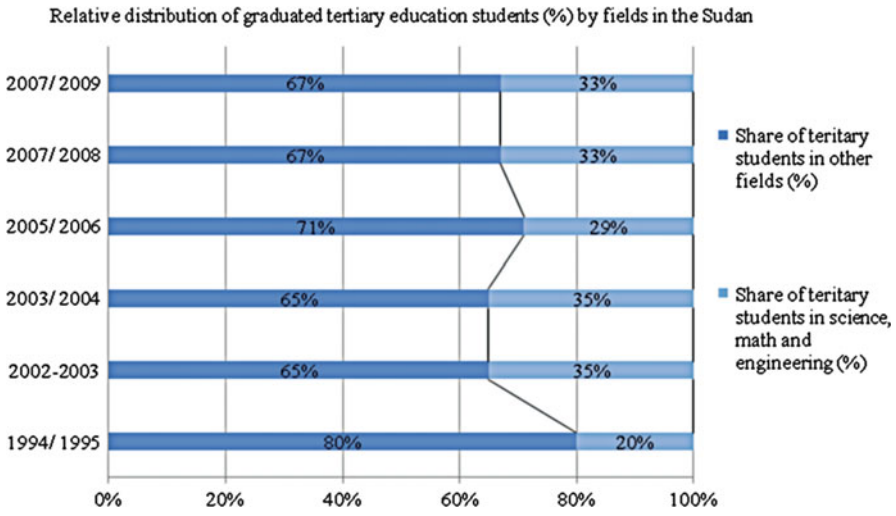

Fig. 9.25 Relative distribution of graduated tertiary education students (%) by fields in the Sudan (1994/1995–2007/2009) (Source: Own calculation based on Sudan Ministry of Higher Education and Scientific Research, the Annual Educational Statistics Reports Various Issues (1993/1994–2008/2009))

9.2.4 Return, Efficiency and Quality of Educational Policies

Another common characteristic of the educational system in Sudan and the Gulf countries is the low commitment to the standardised international efficiency criterion and the weak internal efficiency/quality of primary, secondary and tertiary education; the severity of the problem varies across the main regions in Sudan.[17] For instance, Table 9.14 below illustrates that in the period 2006–09, the percentage of repeaters in primary schooling was high in Sudan and in Saudi Arabia, while the percentages of transition to secondary and tertiary education were low in Sudan and Saudi Arabia.[18]

The UNESCO indicators on the quality of education implies that the average for Sudan and the Gulf countries in terms of quality of education has improved over time; the performance for Sudan is lower than the Gulf as is apparent from the considerable decline in the percentage of repeaters in primary schooling and

[17] No relevant data and information is available to allow an assessment of the quality of tertiary education.

[18] "The poor quality is attributed to: (a) high repetition rates in primary and secondary level, (b) weak absorptive capacity and performance level of students at all levels. (c) failure of educational strategy to motivate innovative skills and problem solving ability/skills, (e) low public and private spending on education, (f) high focus on quantity at the expense of quality; (g) lack of monitoring systems/ institutions to measure and assess the performance of educational and training institutions, (h) lack of trained teachers and (i) lack of materials, infrastructure and facilities". See Suleiman (2007), pp. 121–123; Jalal al-Din (2002), pp. 22–24.

Table 9.14 The quality of education in Sudan and the Gulf countries: and regional distribution and share of main regions in Sudan government basic education defined by the percentage of repetition, transition and dropouts (%) (1995–2009)

(a) Quality of education in the Sudan and Gulf countries: percentage of repetition and transition (1990–2002)

Indicator	Percentage of repeaters primary and secondary education (%):				Percentage of reaching secondary and tertiary education (%)					
	Primary education (%)			Secondary education (%)	Secondary education (%)		Tertiary education (%)		Primary to secondary transition rates (%)	
Country/y ear	1999 [a]	2002[b]	2008/2009[c, d]	2008[d]	1995[a]	2008[d]	1995[a]	2008[d]	1998–2002[b]	2008[d]
Sudan	11	5	4	3	93	94	74–86	93	94	94
Bahrain	4	4	2	5	99		95		98	96
Kuwait	3	3	1	8	97	100	96	100	98	97
Oman	8	4	1	2	99	99	96	100	98	97
Qatar	3		1	3	100	97	98	97	96	99
Saudi Arabia			3[d]–4[c]	4	96	97	89	96	97	94
UAE	3	3	2	5	93	100	83	100	98	98
Average Gulf	4	4	2	5	97	99	93	99	98	97

(b) Repeaters (%)[e]	2006			2007			2008			2009		
	M	F	MF	M	F	MF	M	F	MF	M	F	MF
All Sudan	3.2 %	2.9 %	2.7 %	6.6 %	6.4 %	6.5 %	5.4 %	5.2 %	5.3 %	4.4 %	4.2 %	4.3 %
Northern	7 %	6 %	3 %	10 %	8 %	9 %	8 %	7 %	8 %	12 %	8 %	10 %
Khartoum	1.30 %	1.1 %	1.2 %	0.9 %	0.7 %	0.8 %	0.9 %	0.6 %	0.7 %	0.9 %	0.7 %	0.8 %
Central	3 %	2 %	2 %	4 %	4 %	4 %	4 %	4 %	4 %	4 %	4 %	4 %
Kordofan	9 %	8 %	5 %	10 %	10 %	10 %	10 %	10 %	10 %	6 %	7 %	6 %
Darfur	0 %	0 %	0 %	9 %	10 %	9 %	6 %	6 %	6 %	3 %	3 %	3 %
Eastern	5 %	4 %	2 %	12 %	14 %	13 %	10 %	11 %	10 %	8 %	8 %	8 %

(continued)

Table 9.14 (continued)

(c) Dropouts (%)[e]	2006			2007			2008			2009		
	M	F	MF	M	F	MF	M	F	MF	M	F	MF
All Sudan	1.6 %	1.4 %	1.4 %	3.4 %	3.2 %	3.3 %	2.7 %	2.5 %	2.6 %	1.4 %	1.2 %	1.3 %
Northern	1 %	1 %	1 %	2 %	1 %	1 %	1 %	1 %	1 %	1 %	1 %	1 %
Khartoum	1.2 %	1.2 %	1.2 %	0.3 %	0.5 %	0.4 %	0.3 %	0.4 %	0.4 %	0.3 %	0.4 %	0.4 %
Central	2 %	1 %	1 %	2 %	3 %	3 %	2 %	2 %	2 %	1 %	1 %	1 %
Kordofan	3 %	2 %	2 %	4 %	3 %	4 %	3 %	3 %	3 %	2 %	2 %	2 %
Darfur	0 %	0 %	0 %	6 %	6 %	6 %	4 %	4 %	4 %	2 %	2 %	2 %
Eastern	1 %	1 %	1 %	8 %	8 %	8 %	7 %	7 %	7 %	2 %	2 %	2 %

[a]UNESCO–UIS (2000) UNESCO's World Education Report (2000)
[b]UNESCO –UIS (2004c) country profile: statistics refer to the most recent year between 1998 and 2002
[c]UNESCO Global Background information on Education Statistics: UNESCO- UIS Data Centre: Beyond 20/20 WDS (2011)
[d]UNESCO-UIS (2010) "Global education digest 2010 Comparing education statistics around the world"
[e]Own calculation based on Sudan Ministry of Education, the Annual Educational Statistics Reports Various Issues (2001–2009): (2005–2006: 39–42), (2006–2007: 38–41), (2007–2008: 40–63), (2008–2009: 62–65)

increase in the percentages of transition from primary to secondary education, however, across the main regions in Sudan poor quality is still obvious. For instance, Table 9.14 indicates that throughout the period 2006–09 the percentages of repeaters in primary schooling increased from 2.7 % in 2006 to 6.5 % in 2007 and 5.3 % in 2008 but declined to 4.3 % in 2009. Moreover, Table 9.14 indicates that throughout the period 2006–09 the percentages of dropouts from education in primary schooling increased from 1.4 % in 2006 to 3.3 % in 2007 and 2.6 % in 2008 but declined to 1.3 % in 2009. Therefore, further efforts are needed to enhance the quality of education at all levels, in order to avoid the exacerbation of the problems that will result in the event of a failure to implement some effective policies to improve the quality of education. Moreover, we observe the improvement in the quality as measured by the decline in the percentage of repeaters and dropout despite the decline in the percentage of success in the basic education. We observe the low commitment to the standardised international efficiency and equity criterions and the incidence of considerable regional disparity between the main regions in Sudan. For instance, the efficiency and quality of primary and secondary education, as measured by low percentage of repeaters and dropout in basic and secondary education, are relatively better in Khartoum region followed by the central regions as compared to the Darfur, Kordofan, Eastern and Northern regions respectively. In addition this regional disparity in the quality of education also holds for the percentages of success in the basic education which are reported high in the Northern region followed by the Central, Kordofan, Eastern, Khartoum and Darfur regions respectively. This regional disparity in the quality of education is not surprising in view of the fact that these regions also reported the large share in terms of quantitative supply and demand in basic and secondary education over the period 2001–09 as we explained above in this section. Furthermore, we find evidence of the gender differences that appear in terms of the efficiency and quality of education across the main regions in Sudan as measured by the percentage of repeaters and dropout from basic education. For instance, Table 9.14 indicates that over the period 2006–09 the percentages of repeaters and dropout in primary education for female students are less than those of male students for the majority of the main regions in Sudan. It is the need to work that probably has the largest effect on the withdrawal of boys from school.

In addition, the poor quality of education can be observed from the results of the percentage of success in Sudan's basic education certificate (2000/01–2008/09) and percentage of success in Sudan's secondary school certificate (1996/97–2007/08). For instance, Table 9.15 indicates that throughout the period 2000/01–2008/09 the percentage of success in Sudan's basic education certificate declined from 71.9 % in 2001 to 71.4 % in 2006 and then increased to 73.7 %, and 76.4 % in 2007 and 2008 respectively but declined to 74.9 % in 2009. Moreover, Table 9.15 indicates that over the period 1996/97–2007/08 the percentage of success in Sudan's secondary school certificate increased from 69.4 % in 1996/97 to 73.5 %, 75.4 % and 75.9 % in 2000/01, 2001/02 and 2002/03 respectively but then declined to 72.1 %, 71.4 %, 73.7 %, 74.1 % and 73.7 % in 2003/04, 2004/05, 2005/06, 2006/07 and 2007/08 respectively. Furthermore, the reported annual success in Sudan academic secondary education is higher than Sudan's technical secondary education; the

Table 9.15 The percentage of success in Sudan basic education certificate defined by gender and main regions and Sudan secondary school certificate defined by secondary education type in Sudan (1996/1997–2009)

(a) Sudan basic education certificate basic results percentage of successors (%) by sex and state (2000/2001–2008/2009)

	2001			2006	2007			2008			2009		
	M	F	MF	MF	M	F	MF	M	F	MF	M	F	MF
All Sudan	73.1	72.9	71.9	71.4	72.7	74.5	73.7	72.9	80.4	76.4	73	73.5	74.9
Northern	76	78	66	93	86	92	89	92	96	94	92	97	95
Khartoum	68.5	74.2	71.4	65.3	65.3	59.4	62.8	75.2	82.8	79	63.8	71.1	67.3
Central	76	72	74	76	74	78	76	75	76	75	78	78	78
Kordofan	67	62	64	73	70	70	70	74	73	74	74	74	74
Darfur	75	67	72	60	73	69	72	67	59	64	67	60	64
Eastern	72	64	68	62	66	72	68	63	69	65	68	74	71
Southern	75	80	77										

(b) Sudan secondary school certificate percentage of successors according to education type (1996/1997–2007/2008) (%)

	1996/1997	1997/1998	1998/1999	1999/2000	2000/2001	2001/2002	2002/2003	2003/2004	2004/2005	2005/2006	2006/2007	2007/2008
Government academic secondary education	69.4	70.8	62.1	63.4	73.5	75.4	75.9	72.1	71.4	73.7	74.1	73.7
Non-government academic secondary education	66.0	67.4	73.1	76.3	79.0	78.8	70.9	73.6	74.1	72.0	71.9	73.5
Teacher union	59.6	48.3	60.6	60.0	66.6	66.7	60.6	65.3	65.8	63.5	64.2	65.3
Irregular	75.2	78.9	79.8	78.5	84.1	78.7	66.8	77.5	74.5	74.3	71.3	75.0
All academic education	66.9	66.0	65.1	66.5	74.3	74.1	70.1	71.3	70.8	70.7	70.4	71.3
Technical commercial secondary education	47.9	35.8	52.4	46.0	57.0	52.5	52.4	53.5	52.1	49.4	48.4	49.0
Technical industrial education	55.8	44.1	40.5	37.0	52.0	51.4	44.5	43.8	41.8	43.5	46.0	45.7

Technical agriculture education	37.3	29.2	44.9	26.7	47.0	44.8	46.5	45.8	49.3	52.7	54.2	49.7
Technical home education	35.0	41.3	40.3	23.4	48.7	45.7	42.3	39.8	59.8	62.4	41.0	43.7
All technical education	48.3	37.9	48.9	42.2	55.0	51.8	48.7	48.6	47.3	47.0	47.1	47.2
Vocational training				87.4	92.3	88.5	89.3	85.8			76.6	77.7
Ahlia		67.4	57.8	84.8	85.0	91.6	82.0	79.7	78.3	86.5	84.4	83.2

Source: Own calculation based on Sudan Ministry of Education, the Annual Educational Statistics Reports Various Issues (2001–2009): (a) (2000–2001: 22), (2001–2002: 32), (2003–2004: 26), (2004–2005: 24), (2005–2006: 23), (2006–2007: 23), (2007–2008: 25), (2008–2009: 45), and (b) (2000–2001: 24), (2008–2009: 48).

technical education not only showed a very poor but also a continuous declining annual rate of success over the period 1996/97–2007/08 (see Table 9.15 below). Al-tuhami (2007) finds many reasons for the poor quality problem of technical education in Sudan. For example, the lack of clear vision regarding technical education, lack of central body for organisation, planning and development, the transfer of technical education schools to the States in 1993, weak relationship between technical educational policies and development planning and mismatch between specialisations and content of technical education courses and requirements in the labour market. In addition: the lack of financial resources, facilities and infrastructure (such as buildings, laboratories, workshops, halls, books and references), the critical shortage of qualified and trained Sudanese teachers and trainers specialised in technical education in accordance to the requirements of the labour market and the lack of favourable educational environments and facilities for supporting, hosting and accommodating students in technical education. Further to the social/cultural aspects, due to high preference for enrolment in academic education and low preference for enrolment in technical education, there is a lack of appreciation in the society and lack of attractive working conditions for graduates of technical education that discourage involvement in technical education and work. In addition to: deficiency of the current structure, which implies the sudden move of students from basic school to technical education, lack of a specialised institutional body for preparing technical secondary education courses, lack of linkages between technical education in secondary and tertiary levels, easy transfer from technical to academic education, and from industrial apprenticeships to technological colleges, low rates of enrolment and graduation and low opportunities for postgraduate studies in the fields of technical colleges and tertiary education (Al-tuhami 2007: 2–12).[19]

Therefore, our findings presented above imply that the low commitment to the standardised international efficiency criterion and poor quality and efficiency is obvious not only from the supply side as measured by low rates of trained teachers and over-crowded classrooms as indicated by students enrolment per education institutions as we explained above (see Tables 9.2, 9.6, and 9.11 and Figs. 9.7, 9.8, 9.9, 9.11, and 9.12 above), but also holds from the demand side as measured by low rates of enrolment and attendance, high rates of dropout, high rates of repetition and weak rates of success in the final exams in the basic and secondary, mainly, technical education.[20]

Apart from the problem with regard to enrolment ratios, as with most developing countries, the quality of education in Sudan and the Arab region poses a serious problem. Our findings presented above concerning the poor quality and low

[19] See for instance, Altuhami (2008), pp. 2–12; Mohammed (2008), pp. 2–20; Ismail (2008), pp. 2–19; and Almagzoub (2007/08).

[20] Suleiman (2007) indicates the most important three standard criteria for assessing education in Sudan, notably, the adequacy, equity and efficiency criterion. Suleiman (2007) discusses the equity standard criterion and notes that the imposition of tuition fees does not help to achieve this equity standard criterion and to reduce any significant differences between high earners and low income earners in Sudan. See Suleiman (2007), p. 122.

commitment to the standardised international efficiency and quality criterion are consistent with the results of Sudanese and Arab literature, notably, Suleiman (2007) and Jalal al-Din (2002) are very useful sources to qualify them; we shall here take up part of their description. For instance, Suleiman (2007) argues that there is a common complaint in Sudan about the poor quality of education in all its stages: primary, secondary and university education. Suleiman (2007) indicates the difficulty to identify or measure the poor quality of education, but he observes that the failure to achieve an acceptable standard of educational efficiency criterion takes the form of high rates of absence of pupils from attending school, high rates of repetition and failure in the final examinations, high numbers of unsuccessful educational institutions, poor training for teachers, overcrowded classrooms with students, shortages of teaching equipment and materials needed for the teaching of some courses, absence of textbooks even for undergraduates, as well as the absence of libraries, all of which adversely affect basic, secondary and tertiary education (Suleiman 2007: 122–123). Moreover, Jalal al-Din (2002) notes that all indicators and reports show that the internal efficiency of public education is extremely low and means that the overall system of general education is characterised by waste, high rates of repetition and dropout, and low enrolment ratios (Jalal al-Din 2002: 23–24). Suleiman (2007) finds that the explanation of poor quality of education is related to several reasons, the first reason is the low public spending on education as a proportion of total public spending, and this low ratio has even declined from 8.4 % in 1997/98 to 6.9 % in 2001/02.[21] This ratio does not include public expenditure on above secondary (higher) education and it could drop more and more when adding to public expenditure on defence and security, especially given that public spending in these areas has increased greatly in Sudan because of its circumstances. Also, this proportion may decline significantly if they attribute it to the national income, which is a standard method that is often used for measuring the share of education of a country's resources and to compare between different countries in terms of allocation of appropriate resources for the provision of adequate level of education in terms of both quality and quantity. Suleiman (2007) indicates that another reason for the low quality of education in Sudan is that despite the expansion in public and private education the adequacy standard criterion (as measured by the ratios of spending on education and enrolment in education) is not only still very low, but also still focuses on quantity over quality in Sudan (Suleiman 2007: 122–121). Jalal al-Din (2002) confirms that the commitment to high quality and internal and external efficiency of education so as to respond to the economic and social needs in Sudan, does not imply that it will be rational to stop expansion of enrolment in higher education; on the contrary it implies the need to stop the policy of continued random quantitative expansion in enrolment in higher education that caused a serious negligence of improving qualitative efficiency in higher education in light of the limited material, human and financial resources (Jalal al-Din 2002: 5). Jalal al-Din (2002), argues that the

[21] See 'Educational Statistics for the Academic Year' (2000/02), p. 10.

financial difficulties faced by some Arab governments led to an unacceptable reduction in material resources and financial resources allocated to higher education institutions. He indicates that it seems public and political pressure forced many governments to swap the quality of education by quantitative expansion; while this a swap might seem politically acceptable in the short term, it will have serious repercussions on educational trends and economic and even political directions in the medium- and long-terms. He argues that in Sudan and some Arab countries, the continuous random unregulated expansion, establishment and opening of more universities and colleges and increases in student enrolment rates in the existing universities without allocation and provision of the required material and financial resources, sufficient numbers of qualified faculty members, sufficient facilities for libraries, books, laboratories, materials and equipment for laboratories has led to serious deterioration in higher education institutions. Due to lack of public funding for universities some universities and colleges were even opened in existing old buildings without making the sufficient infrastructural changes, buildings that were not originally suitable for academic higher education institutions. Libraries, which earlier regularly subscribed to important periodicals and journals no longer do so, so they fail to acquire basic references due to lack of funding in both local and foreign currency, which has led to further deterioration in higher education institutions (Jalal al-Din 2002: 22). Jalal al-Din (2002) explains that the deterioration in the quality of higher education in the Arab countries is related to the fact that the majority of plans which have been prepared in many Arab countries in the fields of labour and employment during the past four decades, in particular the last three decades, implies that on the one hand Arab governments were more interested in hiring the holders of diplomas and university degrees more than hiring the holders of lower certificates. This policy has led to wider and greater demand for higher education in various forms and has also led governments to respond to this social demand through the increasingly quantitative expansion of higher education, regardless of the needs of the economy. On the other hand, universities and other higher education institutions seem to have responded to these directives, convictions and plans through exaggeration in the excessive branching and introduction of narrow disciplines (that are increasingly narrowed year after year) in a rigid system in order to respond to the specific needs of professionals and specialists and it seems that this is the most important dilemma in which universities and higher education institutions in the Arab and in other countries are involved.

Moreover, Jalal al-Din (2002) notes that another problem is related to the lack of favourable environments, which exist in Western universities and communities, to fill the gap in higher education curricula, that does not exist in any reasonable amount in any of the Arab countries (Jalal al-Din 2002: 14). Jalal al-Din (2002) attributes the weakness of the general public's education to the seemingly greater focus on lower levels (recognition and understanding) rather than higher levels (analysis and reflection and systematic application); less attention is paid to refinement of imagination, independent thinking and interest in knowledge and research and less emphasis is also placed on modern sciences, including mathematics and

basic science (Jalal al-Din 2002: 23–24). Jalal al-Din (2002) discusses the implications of rapid quantitative expansion on education experienced by all Arab countries, he indicates that the first implication is that it has led to qualitative deficit and rapid degradation and deterioration in the quality of higher education because it implies that higher education has become merely an extension of general public education in the Arab countries. He finds that another serious implication is that this situation has led to the graduation of students who are less familiar with and have limited ability and knowledge of their disciplines even closely related to their narrow fields of specialisation; it seems that this situation has been taking root and growing in many Arab countries and it has been producing huge surpluses of graduates in specific areas who are not playing a great role in economic and social development due to using obsolete methods of learning (Jalal al-Din 2002: 7–8). Jalal al-Din (2002) notes that further serious implication is that the trend and direction of universities and other higher education institutions do not only suffer qualitative deficit as explained above, but also do not seem compatible with the local environment and community and practical needs. That is probably because not only have education curricula in universities been taken from the curricula of Western universities, but they are also taught and examined by traditional ways (Jalal al-Din 2002: 23–24).

Suleiman (2007) notes that further reason for the poor quality of education in Sudan is that a large number of teachers are currently working in various stages of education without any training (Suleiman 2007: 117). Suleiman (2007) and Jalal al-Din (2002) explain the reasons of poor quality for tertiary education in Sudan (Suleiman 2007: 122–123). Suleiman (2007) shows the links between the policy of upgrading teaching staff and some issues related to quality of higher education and universities in Sudan. Suleiman (2007) indicates that in the past Sudanese universities implemented a policy with regard to selection, appointment, upgrading by emission of teaching assistants on the basis of academic excellence, similar to the best universities in the UK, USA or elsewhere, as appropriate for their fields of specialisation. This policy allowed the external exposition of excellent international higher education and acquisition of high quality knowledge that also contributed to the promotion of excellence in Sudanese universities. Suleiman (2007) indicates that the problem with regards to the shift from this past policy and recent focus on alternative policy of localisation of knowledge, where the process of "breeding" could be followed by some universities, now means that university graduates are then appointed to teach after studying their Master's or doctorate, yet only know the Arabic language and do not know of any other university except their own. Suleiman (2007) indicates that this policy of "hatching" weakens the universities a lot, because it limits the ability of fulfilling the functions of a faculty member, which is not limited to lectures, but includes regular participation in personal and academic development and revision of the contents of the courses in the area of specialisation in the light of scientific development, selection of new textbooks that are more relevant to the content of new courses, and doing high quality research published in peer-reviewed scientific journals that should assist in economic and social development, in addition to contributing to training and development of

academic rules and regulations to better upgrade the academic level of university over time (Suleiman 2007: 117). Moreover, Jalal al-Din (2002) observes that the lack of funding and deterioration of facilities and deterioration of Sudan's relations with the majority of advanced donor countries, has put some limitations on the regular provision of scholarships and led to interruption of scholarships and limited the opportunities for most professors and graduate students to follow the rapid developments in their area of interests and studies in applied and social sciences. In addition, the low salaries of university professors have limited their ability to acquire scientific books and sometimes forced them to work in other income-generating activities or teaching in several universities to maximise their income; this implies that they do not have any free time to develop their abilities through the follow up of successive developments, even if facilities are available for free. Jalal al-Din (2002) indicates that the deterioration is not only limited to infrastructure or basic standard of living for teachers, but also extends to include teaching staff, as some of universities professors do not originally possess the required qualifications for engagement in teaching or university colleges. Jalal al-Din (2002) argues that part of the continued decline is also due to low capacity of people in charge of higher education, in particular members of the teaching staff as reflected in their weaknesses and limited abilities not only in the field of research and preparation for lectures but also in terms of interaction with students (Jalal al-Din 2002: 12–13, 22).

Jalal al-Din (2002) indicates that the agreed efforts in all Arab countries to achieve the required balance between the tracks of humanitarian and scientific paths, including science, engineering, medicine and agriculture, should not hide the fact that the random expansion in scientific paths, including science, engineering, medicine and agriculture, has led and still leads to serious deterioration in the quality of education, even for disciplines that affect human life such as medicine, pharmacy, architecture, civil engineering and chemical. For instance, the rapid expansion in engineering education in Sudan and some Arab countries has led to rapid decline and continued chronic weaknesses and deterioration in the quality of engineering education that still does not meet the needs of the advanced industrial sector. For example, some of the newly established engineering schools in Sudan completely suffer from the lack of laboratories and workshops, and therefore, in the practical aspects depend mainly on vocational training centres or where available on the laboratory equipment of secondary schools, which are not available in most cases. As a result of this situation, the students of some universities do not have any laboratory experience even after several years of study. For example, the students of the Faculty of Engineering in the Red Sea state had completed seven semesters without conducting any experiments in the laboratory during the period 1993–96, but only three semesters of the ten that are required to achieve a degree in engineering sciences were left until they graduated. This sad situation is accompanied by quantitative and qualitative deficit in the faculty members, where the percentage of students to professors of engineering in some universities has increased to more than 90 students per professor; consequently, these colleges are forced to resort to employing colleagues from abroad, who mostly hold initial university degrees or a Master's degree. Jalal al-Din (2002) observes that the deterioration in the quality is

not only limited to the engineering sciences but also extends to the medical sciences. Jalal al-Din (2002) argues that in fact, the expansion in medical education has been slowing not commensurate with the potential facilities of Sudan and its demographic weight. For example, until 1978 there was only one medical college, and it absorbed no more than 50 students per year; until 1990 the number of medical schools in Sudan was around four colleges, all of which were supposed to accommodate less than 200 students annually. Then an expansion in enrolment throughout the 1990s led to the opening of dozens of colleges in a decade, reaching 26 completely by the third millennium. However, the expansion has not only been limited to the further opening of new colleges, but also focused more on further increases in the number of students admitted each year, for example, the number of students admitted to the Faculty of Medicine at the University of Aljazeera during the academic year 1989/90 was only up to 59 students, but this number jumped to about 400 students per year during the next 3 years, 1991/92–1993/94. This expansion of colleges and numbers of enrolment has happened without being accompanied by the provision of the minimum financial, material and human resources to help accommodate the new colleges in their absorption of these numbers and provision of the minimum required acceptable academic standards. Moreover, these new medical colleges not only lack many of the required disciplines but also they do not have close ties with teaching hospitals and other medical and health facilities that provide practical training for medical students and graduates. In general, all teaching hospitals are still lacking adequate and qualified staff, lacking medical practical equipment to an acceptable and satisfactory level, and also lacking all the required museums of pathology and anatomy. For instance, a report prepared by the Sudan Ministry of Higher Education indicates that in Sudan a lot of new universities lack references, books, periodicals, or that these references are too few, the majority of them are obsolete and few of them are relevant to recent developments in medical science and health. In general, the specialised laboratories of pre-clinical medical sciences are either not available or are incomplete in almost all new universities and the laboratory facilities in all new and old universities are very limited and unsatisfactory, lacking in teaching staff members in basic medical sciences and relying either wholly or partly on visiting lecturers, which lead to weak links and interactions between teachers and students (Jalal al-Din 2002: 15–19). In addition, colleges of medicine, pharmacy, nursing and medical laboratories are often face the difficulties to be closely related with hospitals and pharmaceutical industries in order to provide training for students and researchers in these fields. The attainment of medical and pharmaceutical overseas education is not only expensive and attracts only the best students in the Arab countries, but also it has tended more and more to sub-specialities in diseases that affect only a small percentage of citizens, particularly in the poorer Arab countries. This medical and pharmaceutical education is not available in an acceptable level in universities in the Arab countries, but only in universities in Western countries, which makes distinguished Arab students continue their specialties and their training process in these Western universities and often end up settled in Western societies. The migration of Arab medical specialists trained in Western universities with scholarships financed from public spending in education in Arab countries, implies a great loss for the poor

people in Arab countries, not only because the poor people in the Arab countries partially and indirectly bear part of the burden of subsidising the high spending on educating the migrant Arab medical specialists; but also because the poor people in Arab countries are still susceptible to highly prevalent diseases such as malaria, tuberculosis, schistosomiasis and other diseases, which are not being sufficiently tackled by most of the medical specialists in the Arab countries. Jalal al-Din (2002) argues that medical science, although significant in the fight against poverty and disease, has not received so far the significant progress it deserves in the Arab countries; it has suffered from poor quality because of qualitative and quantitative deficits in the medical staff in poor regions and rural areas, and qualitative deficit despite quantitative surplus in the medical staff in urban cities. Jalal al-Din (2002) notes that apart from that, the level of medical education on the one hand and the level of wages and incentives for doctors and medical facilities available do not help provide any reasonable degree of public health requirements (Jalal al-Din 2002).

Moreover, the poor quality and efficiency of higher education in Sudan is probably related to the short age of some universities. For instance, Sudan Central Bureau of Statistics (1990–2009) shows that three quarters of Sudanese universities were established in the last period between 1991/92–2008/09, and 58 % are no more than 15 years old having been established between 1996/97–2008/09. These results seem consistent with the results in the Arab countries. For instance, the AHDR indicates that three quarters of Arab universities were established in the last quarter of the twentieth century, and 57 % are no more than 15 years old.[22] This observation is telling since higher education institutions, and universities in particular, require a long time to consolidate their institutional structure, and to foster their role in the dissemination and production of knowledge.[23] Our results presented above concerning poor quality and low commitment to the standardised international efficiency and quality criterion in Sudan are consistent with the results in the Arab literature. For instance, the AHDR authors (2003) argue that: "The quality of higher education institutions in Arab countries is affected by many factors, chief among which is the lack of a clear vision, and, as noted earlier, the absence of well-designed policies regulating the educational process. One of the main features of many universities in the Arab world is their lack of autonomy, i.e., they fall under the direct control of the ruling regime. Nevertheless, universities are often the arenas for political and ideological conflicts, the more so because of restrictions imposed on political participation in general and the promotion of political currents that owe allegiance to the regime more particularly. These contextual features have adverse effects on the degree of freedom allowed for education and research. This lack of autonomy has resulted in a situation where universities run according to the requirements of the governing political rationality and not according to a plan. [Higher education institutions often suffer from a lack of funding that prevents them from implementing sound scientific plans]. Some universities, for example, are

[22] See UNDP-AHDR (2003).

[23] See Nader Fergany (1998), pp. 18–19.

overcrowded on account of the uncalculated increase in enrolment rates, simply because the announcement of enrolment numbers in universities has become a political gesture to appease society. The quality of higher education is also influenced by an ongoing decline in expenditure, reflected in inadequate facilities for students and faculty. Quantitative expansion in higher education came at the expense of quality. University libraries are in a sorry state, laboratories are old and cannot accommodate the increasing numbers of students, and classes are overcrowded, thus creating a wide distance between students and teachers. Moreover, faculty members in many Arab universities earn meager salaries, and therefore cannot devote themselves fully to teaching or research".[24]

The dearth of reliable information precluded an analysis and discussion of interesting policy issues related to the quality of the private sector's contributions to both spending and enrolment in tertiary education in Sudan and the Arab countries. Although in the recent years Sudan and most West Asian Arab countries have been overwhelmingly open to private education, however, in terms of quality, it has not produced yet any visible results. Moreover, in Sudan as in most Arab countries, there is strong debate that the private universities are mainly businesses, the only exceptional cases being those of few older "private" universities, which rely on a history of good teaching and patient growth of research. This implies that the increasing private sector's contribution and the observed shortcomings in the quality and performance of the government or public education institutions, however, should not hide the fact that public sector institutions will remain very important; it would not be rational to absolutely replace them by a massive introduction of private education institutions and establishments in Sudan and all Arab countries, not only because of the uncertainties of a contribution to higher education by the private universities, but also because of the potential failure of private universities when deviating to target mainly business and profit objectives instead of focusing on targeting the conventional intrinsic values of higher education and higher quality. And also it is worth noting that the status of higher education, science and scientists is much better in Sudan and the Arab countries (especially in the Maghreb, see UNESCO) than in other parts of the world (e.g. Africa, see STS)[25] where, neoliberal policies have lead to the withdrawal of governments' support, the collapse of renowned establishments and the ruin of the profession, while such a deinstitutionalisation and the replacement by a global market of scientific skills had no results or disastrous ones in terms of scientific publications. Moreover, the bibliometric data demonstrate that the "newly founded" private establishments in Sudan and Arab countries (with the exception of three or four ancient and proud research universities like AUB or St Joseph in Lebanon and to some extent AUC in Cairo) contribute very little to the research output of the country, and that most of them do not care at all about

[24] See UNDP-AHDR (2003), p. 56.

[25] See Roland Waast (2003), pp. 153–181; see also ESTIME (2006), pp. 1–80.

research (see ESTIME 2006). Jalal al-Din (2002) explains that in light of the increasing economic difficulties, the declining public spending in education and increasing dependence on private spending in education, a serious growing trend appearing in higher education in Sudan is that the ability criterion (ability to pay large expenses by the student's higher income groups) has started to replace the merit and efficiency criterion. This is not only detrimental to society's poorest sections but also impairs the efficiency and quality of higher education itself, when the merit is replaced by the ability to pay and to bear the costs, and this has increased the disruption of the relationship between education and work (Jalal al-Din 2002: 22).

9.2.5 The Impacts of Educational Policies on Literacy and Access to Schooling (School Life Expectancy)

Educational policies in Sudan, Arab and Gulf countries lead to only slight improvements in school life expectancy and enrolment in all educational levels. However, in Sudan the educational policies have insufficient effects on improving school life expectancy, which remains low and lags behind when compared to the Arab and international standard. One important positive implication of educational policies is the increase in literacy rates; however, the educational policies have so far only managed to alleviate rather than fully eliminate the youth illiteracy problem in Sudan compared to the Gulf countries. For instance, Table 9.16 illustrates that in 1990 illiteracy rates amongst the youth population was 40 %, throughout the period 1990–2008 it continuously declined, but in the year 2008 it still remained in excess of 30 % in Sudan (30.7 %). Moreover, the youth illiteracy rate for women was in excess of 40 % (40.4 %) and was higher than for men, which accounted for 21 %. This implies that there is an ample room for policy to increase the literacy rate among the young population, especially for women. Furthermore, when comparing the supply and demand sides, we observe that the supply side or public spending seems to be only one component in the educational policies, because higher public spending per se does not imply higher demand, participation and enrolment ratios at all educational levels, access to schooling/school life expectancy and higher literacy rates.

Table 9.16 Educational outcomes: literacy, youth illiteracy rate and school life expectancy in the Sudan and Gulf countries (1990–2008)

	Adult literacy rate (% ages 15 and above)[a, d]			Youth literacy rate (% ages 15–24)[a, d]			Youth illiteracy rate (% ages 15–24)[a, d]			School life expectancy[b, c]	
Country	1990[a]	2002[a]	2008[d]	1990[a]	2002[a]	2008[d]	1990[a]	2002[a]	2008[d]	1999	2008
Sudan	45.8	59.9	69.3	65	79.1	85.2	35	20.9	14.8	4.4	4.6(3)
Bahrain	82.1	88.5	90.8	95.6	98.6	99.7	4.4	1.4	0.3	13.4	
Kuwait	76.7	82.9	94.5	87.5	93.1	98.4	12.5	6.9	1.6	13.6	
Oman	54.7	74.4	86.7	85.6	98.5	97.6	14.4	1.5	3.4	n/a	11.1
Qatar	77.0	84.2	93.1(4)	90.3	94.8	99.1(4)	9.7	5.2	0.9 (4)	12.5	12.7
Saudi Arabia	66.2	77.9	85.5	85.4	93.5	97.3	14.6	6.5	2.7	n/a	13.5
UAE	71.0	77.3	90.0(3)	84.7	91.4	95.0(3)	15.3	8.6	5(3)	10.8	

Note: (1) Data refers to 1991 (2) Data refers to 2000/2001, (1) Data refers to 2005 (2) Data refers to 2007

[a]Calculated from UNDP Human Development Report (2004).

[b]UNESCO–UIS Statistical Yearbook (1999): www.unesco.org.

[c]UIS–UNESCO (2003): www.unesco.org.

[d]UNESCO Global Background information on Education Statistics: UNESCO- UIS Data Centre: Beyond 20/20 WDS (2011). (d) UNESCO-UIS (2010) "Global education digest 2010 Comparing education statistics around the e world".

9.3 Characteristics of Training Policies and The Impact of Educational Policies on Training Policies: Large Mixed and Private Firms and Public Policies of Training and Skills Upgrading in Sudan

Based on the above, this section shows the major characteristics of training policies and the impact of education policies on training policies and skill upgrading in Sudan. Before proceeding to discuss the impact of education policies on training policies and skill upgrading, it is useful to begin with a brief explanation of the major characteristics of training policies in Sudan, in particular the structure and pattern of training policies.

9.3.1 Characteristics of Training Policies in Sudan

Starting with the major characteristics of training policies in Sudan, we observe the biased structure in terms of type, duration and specialisation pattern of training policies and the low commitment to efficiency, adequacy and equity criterion in the provision of training in Sudan over the period 2004–09. In particular, beginning with the biased structure, we find that one major characteristic of training policies in Sudan is the biased structure in terms of type and duration of training, which indicates greater focus on internal type training (99 %, 98 %), particularly training that achieved during the short run (99 %, 96 %) as compared to external type training (2 %, 2 %), particularly training that achieved during the long run (1 %, 4 %). In addition, another characteristic of training policies in Sudan is the biased structure in terms of specialisation pattern of training, which indicates that training seems to be more biased towards practical specialisation pattern of training (88–73 %) as compared to academic specialisation pattern of training (12–27 %) in Sudan over the period 2004–09. This biased structure in terms of type, duration and specialisation pattern of training may imply the low commitment to the efficiency criterion and that has most probably immensely undermined the efficient provision of training. Another major characteristic of training policies in Sudan is the inadequate financial resources allocated for training, for instance, the annual training budget implies serious inadequacy in terms of finance allocated for training, as the real training budget represents only 46.5 % of the total budget approved for training in Sudan in 2009. This implies the low commitment to the adequacy criterion in the provision of financial resources for enhancing training in Sudan. Moreover, another characteristic of training policies in Sudan is significant regional disparity across the main geographical regions as measured by the share of the main regions in terms of supply side as measured by the total number of training centres, the demand side as measured by the capacity of training centres and the impact of

training as measured by the share of trained work force as a percentage of total labour force and the share in internal and external short and long run training in Sudan 2004–09. In particular, from the distribution and share of main regions in training we observe the high share and greater concentration of training in the Khartoum region as compared to other regions in terms of the regional share in the supply side as measured by total number of training centres, the demand side as measured by the capacity of training centres and the impact of training as measured by the share of trained work force as a percentage of total labour force and the share in internal and external short and long run training in Sudan over the period 2004–09. This implies the low commitment to the equity criterion in terms of supply, demand sides and impact in the provision of training for different geographical regions in Sudan. Moreover, we observe that the disparity between Khartoum and other regions in terms of capacity of training centres implies the full utilisation of capacity of training in centres located in Khartoum as compared to under-utilisation of capacity of training centres located in others regions that most probably critically undermined the efficient provision of training. Therefore, the low commitment to efficiency, adequacy and equity in the provision of training led to limited effect of training in upgrading skill level for the labour force; this is observable from the low share of trained labour force that accounts for only 16 % and 17 % of the total labour force in Sudan in 2008 and 2009 respectively (see Table 9.17 below and Figs. 9.26, 9.27, 9.28, and 9.29 below).

9.3.2 The Impact of Educational Policies on Training Policies: Large Mixed and Private Firms and Public Policies of Training and Skills Upgrading

Our findings presented above concerning the low commitment to adequacy, equity and efficiency in the provision of education and training imply that the educational policies in Sudan have insufficient effect on training provision and failed to integrate sufficiently with training policies. This is probably because the relationship between the educational and training policies are somewhat separated from each other in Sudan. For instance, technical education and technological education are integrated in secondary and higher educational institutions and are administered by the Ministries of Education and Higher Education respectively, whereas the official general public training (including vocational training and apprenticeships) are separated from educational institutions and integrated within three official public training entities that are administered by independent institutions headed

by the Minister of Labour, Public Service and Human Resources Development.[26] This organisational structure implies that educational policies in Sudan are still needed to enhance the fruitful cooperation, coordination and integration with training policies.

Earlier findings in Chap. 5 show that the lack of interaction between educational and training systems hinders the provision of training and upskilling plans within private firms. We will illustrate below that the interaction between educational and training policies appears to be effective only within very large two mixed and private firms that adopt training policies consistent/in line with public policies.

Table 9.18 illustrates the case of two of the largest mixed and private enterprises in Sudan, namely, Kenana Sugar Company (KSC) and DAL Group; both are astonishing Sudanese success stories, which seem committed to implement diversified training and skill upgrading policies that are quite consistent with the line taken by public policies. In particular, they adopt similar strategies that highlight training and upskilling of workers, linkages with universities to absorb graduates, active human resources development units and recruitment policies to set up and implement regular internal and external training plans and wide use of ICT to upskilling workers. Therefore, in contrast to the other private firms, these two large mixed and private firms (KSC and DAL) have successfully contributed to

[26] Suleiman (2007) indicates training institutions and training fields that received some attention in Sudan include for example, the Institute of Public Administration in Khartoum that offers training in public service and public administration for managers and teachers and the Center for Management Development in Khartoum that provides training programmes with limited fees for private and public sectors and the states, for example in 2005 it provided 28 training programmes in the computer field. Suleiman (2007) discusses some problematic issues related to training in Sudan and indicates that since independence and so far training in general has not found the attention it deserves, it has suffered due to lack of resources allocation, it remained weak and almost entirely concentrated in the capital Khartoum – particularly vocational training. Perhaps this reflects the fact that human development is not given the priority it is worthy of. Suleiman (2007) believes that currently (in 2005) the one of the most important difficulties for various kinds and levels of training in Sudan is the critical shortage of well-qualified and experienced trainers. Suleiman (2007) indicates that other problem is that the provision of high quality training with commitment to efficiency is costly and expensive, especially, vocational training, that requires the availability of construction, equipment and materials, and above all trainers who have the ability and knowledge necessary to provide effective training. In Sudan the Supreme Council for vocational training and apprenticeship was established under the law of vocational training and apprenticeships for the year 2001. The council represents a good step, as it has become responsible for the regulation and control of vocational training and apprenticeships, but it seems that it does not obtain the sufficient resources to play its role fully and effectively, as it gets the funding for the first quarter only in addition to training fees, and although the training fees are not high, it does not help to attract people to the training due to their weak resources or income due to the country's high poverty rate. Also, the training fees cannot provide adequate money, which is required for covering the requirements of offering effective training, equipment, materials and salaries high enough to retain the well-qualified and experienced trainers and avoid their migration. Suleiman (2007), pp. 112, 114–115.

serve the public policies for enhancing training and skill upgrading (cf. Table 9.18 below).,[27, 28] However, it is less clear whether these two large mixed and private firms (KSC and DAL) induce positive effects on upskilling workers in private firms. In our view, the interpretation of the serious discrepancy between these two large mixed and private firms and other firms can be attributed to presence of high

[27] Kenana Sugar Company (KSC) is the largest integrated sugar project in the world, it is the world's largest producer of white sugar, and it is located 250 km south of Khartoum, Sudan. Behind KSC success story a combination of factors such as sound plans, advanced western technology, Arab finance, and the rich natural resources of area (climate, fertile soils and the Nile waters). KSC employs up to 16,000 workers (50 % permanent), and provides education and healthcare to the 100,000 people who are estimated to depend on the plant. It also makes Sudan self-sufficient in sugar (the domestic market consumes some 150,000 tonnes) and provides valuable export earnings. Most of the sugar that is exported goes to African and Middle Eastern states, as well as India and Bangladesh, and as far away as Europe. Molasses are sold to Britain and the Netherlands. KSC is also supporting scientific research and vocational training and providing education, health and electricity supply services to the estimated 100,000 population of the area. KSC production activity focuses mainly on growing sugar cane and processing it to produce white refined sugar, molasses and honey, in addition to other products such as milk products. KSC is established in 1975 as a joint venture between the Government of the Republic of Sudan (35.33 %), General Investment Authority of Kuwait (30.64 %), Government of the Kingdom of Saudi Arabia (10.97 %), Arab Company for Investment (6.99 %), Industrial Development Bank (5.69 %), Arab Authority for Agricultural Investment and Development (5.59 %), Group of Sudanese commercial banks (4.47 %), Gulf Fish Company (0.16 %) and Nesho Iwai Corporation (0.16 %). See Arab Authority for Agricultural Investment and Development website: http://www.aaaid.org/arabic/AAAID_COM/KSC.htm, accessed 10 April 2011.

[28] DAL Group started out in 1951 as an engineering dealership company under the name Sayer & Colley founded in 1952 by two British businessmen. The company specialises in trading engineering products, such as bearings and belts, and is later awarded the Caterpillar dealership for Sudan. In 1966, 10 years after Sudan's independence, Caterpillar decides to transfer the dealership to a Sudanese company; the original British owners retained a minority share. The contract was awarded to Mr. Daoud Abdellatif and his newly created Sudanese Tractors Company (SUTRAC). In 1970–71 Sudanese Tractors Company (SUTRAC) and Sayer & Colley were both nationalised. Within a year, the companies had been denationalised with the government retaining a minority share (the British partners were bought out), and in 1978–79 the name of the company had changed from Sayer & Colley to Daoud Abdellatif Engineering, later abbreviated as 'DAL Engineering'. After that DAL Engineering expanded to include other activities and the name has changed to Daoud Abdellatif Group or 'DAL Group', which included SUTRAC (1952), DAL Agriculture (1984), DAL Property Development (1988), DAL Motors (1994), Sayga Flour Mills (1996), the Blue Nile Dairy company (today DAL Dairy) (1997), DAL Medical (1997), Sudanese Liquid Air (SLA) (1998), DAL Food Industries (DFI) (2002) and Khartoum International Community School (KICS) (2004). Due to this expansion since its establishment in 1951, the DAL Group has become one of the largest and most diversified conglomerates in Sudan, operating to international standards, underpinned by strong, clear business principles. The Group businesses play a leading role in their fields and operate ten businesses across six sectors – food, agriculture, engineering, real estate property development, medical services and education (DAL runs a non-profit school). DAL Group has a presence in seven countries, China, Malaysia, UAE, Saudi Arabia, Djibouti, Ethiopia and the UK and represents 38 international brands in Sudan, including some of the world's best known brands. See: http://www.dalgroup.com, Accessed 10 April 2011.

Table 9.17 Regional distribution and share of main regions in total number of training centers, capacity, trained work force and internal and external training in Sudan (2004–2009) (%)

(a) Number of training centers, capacity and trained work force

	Total number of training centers		Share in total number of training centers		Total capacity of training centers		Total number of training centers/total capacity of training centers		Trained work force/total labour force (2008–2009) (%)		
	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	Change (2008–2009)
All Sudan	64,927	65,929	100 %	100 %	74,984	78,318	86.59 %	84.18 %	16.12 %	17 %	0.88 %
Northern	15	17	0.023 %	0.026 %					64 %	70.00 %	6 %
Khartoum	64,864	65,864	99.903 %	99.901 %		65,864		100 %		13.06 %	
Central	29	29	0.045 %	0.044 %	7000	10,234	0.41 %	0.28 %	2.%	2.90 %	0.9 %
Kordofan	15	15	0.023 %	0.023 %	1050	1050	1.43 %	1.43 %	6.09 %	4.65 %	−1.44 %
Darfur	2	2	0.003 %	0.003 %	720	720	0.28 %	0.28 %	3.22 %	3.37 %	0.15 %
Eastern	2	2	0.003 %	0.003 %	350	350	0.57 %	0.57 %	5.3 %	8.00 %	2.7 %

(b) Internal and external training

	Internal training						External training						Total internal and external training	
	Short t run		Long run		Total		Short run		Long run		Total		Total	
	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009
All Sudan	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Northern	3 %	6 %	0 %	0 %	3 %	5 %	4 %	13 %	22 %	16 %	10 %	14 %	3 %	5 %
Khartoum	55 %	58 %	0 %	31 %	55 %	57 %	10 %	23 %	54 %	54 %	26 %	40 %	54 %	57 %
Central	23 %	15 %	28 %	10 %	23 %	15 %	17 %	35 %	14 %	10 %	16 %	22 %	23 %	15 %
Kordofan	10 %	7 %	49 %	15 %	11 %	7 %	28 %	10 %	10 %	5 %	22 %	7 %	11 %	7 %
Darfur	1 %	3 %	1 %	7 %	1 %	3 %	9 %	10 %	0 %	0 %	6 %	5 %	1 %	3 %
Eastern	8 %	12 %	22 %	12 %	8 %	12 %	8 %	9 %	0 %	0 %	5 %	4 %	8 %	12 %

Source: (a) Sudan Ministry of Federal Government and the General Secretariat of the National Council for strategic planning (2009) "Performance Digital Reports of the Northern States (2009)". p. 471. (b) Sudan Ministry of Federal Government and the General Secretariat of the National Council for strategic planning (2009) "Performance Digital Reports of the Northern States (2009)". pp. 446–447

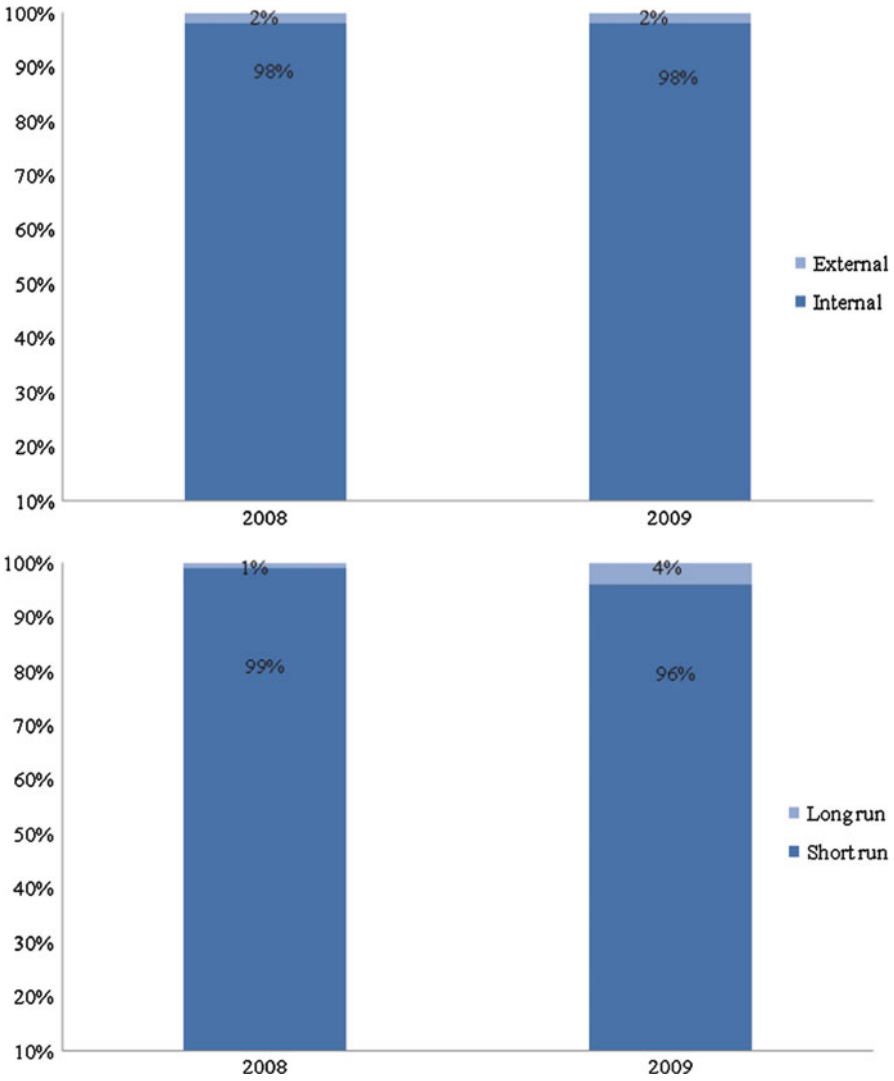

Fig. 9.26 The share of internal and external short and long types of training in total training in Sudan (%) (2008–2009) (Source: The National Center for training -Ministry of Labour, Public Service and Human Resources Development Report (2007–2009) – cited in the General Secretariat of the National Council for strategic planning. p. 439)

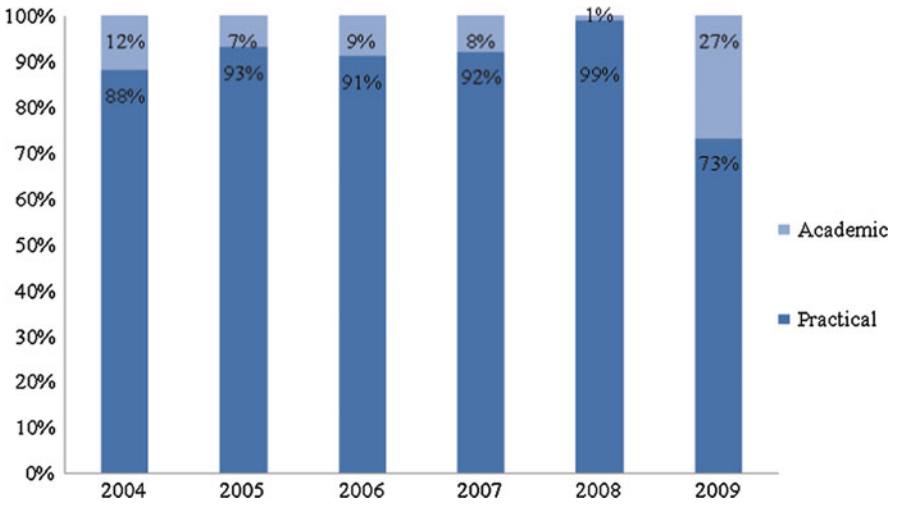

Fig. 9.27 The share of academic and practical types of training in total training in Sudan (%) (2004–2009) (Source: The National Center for training -Ministry of Labour, Public Service and Human Resources Development Report (2007–2009) – cited in the General Secretariat of the National Council for strategic planning. p. 439)

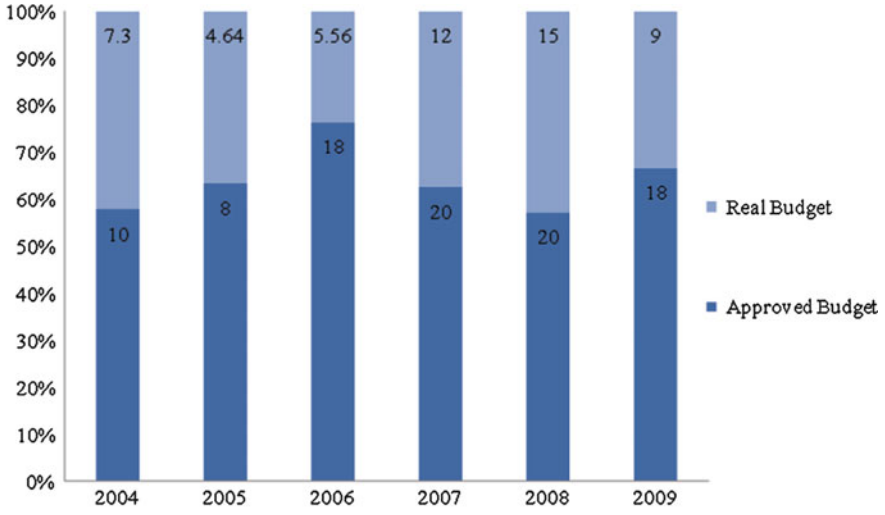

Fig. 9.28 The total approved budget and real budget for training in Sudan (Million Sudanese Pounds) (2004–2009) (Source: The National Center for training -Ministry of Labour, Public Service and Human Resources Development Report (2007–2009) – cited in the General Secretariat of the National Council for strategic planning. p. 439)

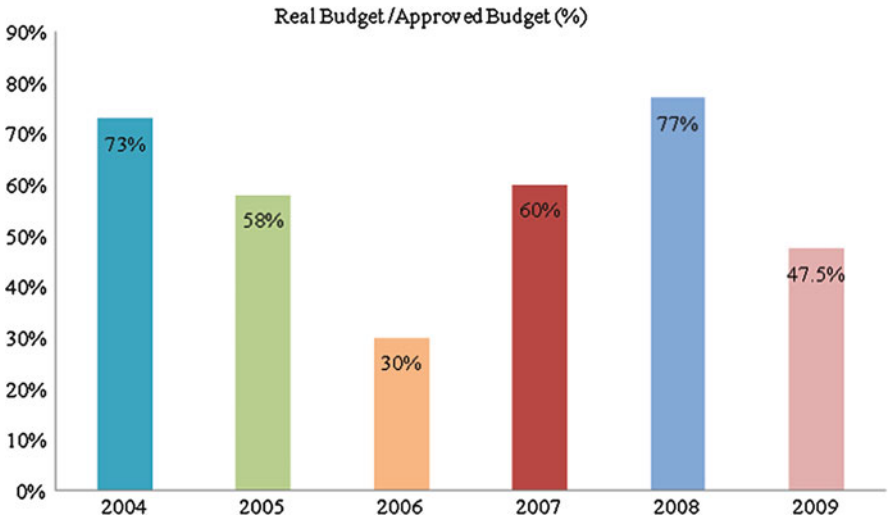

Fig. 9.29 The ratio of total real budget /approved budget for training in Sudan (%) (2004–2009) (Source: The National Center for training -Ministry of Labour, Public Service and Human Resources Development Report (2007–2009) – cited in the General Secretariat of the National Council for strategic planning. p. 439)

resources, support and incentives within these two firms, which are probably lacking within other private firms.,[29, 30]

[29] For instance, the selected two largest mixed and private firms have several common characteristics such as large market size, namely size of employment, capital (local capital), market, products, sales, sales revenues; investment in ICT, use of advanced technologies and active R&D/technology development units.

[30] From the results of the firm survey (2010) and the selected two cases of large mixed and private firms studied in this chapter, it may be true that large firms are systematically more organised than medium and small firms. It is therefore plausible to expect that the large firms to have higher financial capacity to support training and skill upgrading than medium and small firms. However, it is less clear and hard to make generalisations to conclude whether this applies to all other large firms as well, because the available information for Sudan indicates the classification of firms according to size, activities and ownership (nationality of main owner(s)) rather than public-private sectors. Suleiman (2007) notes that in Sudan in the private sector the large firms are relatively willing to train employees from time to time, due to high costs of training programmes and absence of trainees for work during training period. If the number of employees is small, this may adversely affect the production, which can be regarded as indirect or additional costs for training. Despite the fact that workers in small enterprises may be in more need for training of their counterparts in large enterprises, the weakness of the capabilities and the small number of staff may prevent it. Suleiman notes that, in addition the large firms often have the capabilities and attractiveness to attract the well-qualified workers and staff from the outset, who are thus in less need of training. It is thus clear that the training of workers is often determined by the availability of the capabilities and the facilities of the largest firms more than it is determined by the need for it. He point out that the State must help small establishments in the process of training, especially since the small establishment constitutes the largest number and most widespread geographically

The major policy implication from these findings is that the improvement of the educational systems in Sudan is essential and requires improvement of adequacy, equity and efficiency including quality/internal efficiency, supply (investment) and demand (enrolment) sides, particularly with respect to tertiary and technical education. From that perspective, we explain below the views of the policy makers and experts regarding the relevant plans and policies to reform the educational system, which is essential for skill development. After that, we show that policy makers, experts and firms all view the improvement of education as important for enhancing the provision of training and knowledge transfer/external schooling effects.

9.4 Plans and Policies and Mechanisms for Skill Development: The Macro–Micro Views

The major policy implication from these findings is that the improvement of the educational systems in Sudan is essential and requires improvement of adequacy, equity and efficiency including quality/internal efficiency, supply (investment) and demand (enrolment) sides, particularly with respect to tertiary and technical education. From that perspective, we explain below the views of the policy makers and experts regarding the relevant plans and policies to reform the educational system, which is essential for skill development. After that, we show that policy makers, experts and firms all view the improvement of education as important for enhancing the provision of training and knowledge transfer/external schooling effects

It is useful in this section to discuss and compare first the relevant plans and then policies and mechanisms for skill development from both macro and micro perspectives/views.

9.4.1 Plans for Skill Development: The Macro–Micro Views

In light of the above findings, we now use the results of the macro and firm surveys (2010) to provide insights to help generate policies to enhance skill levels by implementation of short- and long-term plans at the macro–micro levels. We then compare and integrate the macro (official: policy makers and experts) and micro (firms) views concerning the important tools and plans for skills development in the current, short run and long run.

The policy makers and experts suggest several important instruments for skill development, some of which have already been implemented and others being

in Sudan and also because the private sector in Sudan in general is still emerging and needs the assistance and protection in the face of competition from imports at home and competition abroad in the area of export. See Suleiman (2007), pp. 109–110.

implemented now or in the near future. For instance, Table 9.19 shows that the policy makers and experts highlight investment in training of existing employees, investment in vocational training, improving the quality of teachers, trainers and mentors and encouraging learning on the job. This is to be coupled with investment in formal education, using ICT to upgrade skill levels, enhancing the system or programme of apprenticeship, sending teachers and mentors abroad to acquire knowledge and skills and sending workers abroad to acquire skills.[31] Measures such as supporting long distance learning, enhancing the system of accreditation and licensing, sending students abroad to acquire knowledge and skills and bringing/attracting new foreign skills, scientists and engineers from abroad are viewed as somewhat less important factors. [32] In addition to the official perspective, other less important factors for enhancing skill upgrading in Sudan include: increasing motivations, follow-up, increasing the effectiveness of the national training strategies and policies, improving work environment and condition and encouragement of interest in other languages, specifically English, to facilitate communication with international communities and learning from the experiences of other countries. In addition: increasing motivation by offering scholarships to encourage continuing education, training and learning, improvement of education and training curriculum, facilitating the ownership of modern information technology and modern methods of learning (computer per learner) to promote single education and distance education, reviewing government strategies in all education levels, specification of an annual fixed percentage of national expenditure for education and training, provision of equal education and training opportunities to reducing the regional disparity in the provision of education and training and unbalanced development in human resources and finally, establishment of a specialised ministry responsible for national human resources development. Plans currently implemented include investment in education, investment in training of existing employees, investment in vocational training, improving the quality of teachers, trainers and mentors, enhancing the system or programme of apprenticeships, using ICT to upgrade skill levels, bringing/attracting new foreign skills, scientists and engineers from abroad and sending workers, teachers and students abroad to acquire knowledge and skills and encouraging learning on the job. However, our earlier discussion in this chapter and in Chap. 5 above, illustrates the serious shortcomings of some of these components, particularly with respect to investment in education, training and vocational education. Hence, the officials' view suggests further efforts in the short run to motivate investment in education, investment in training of existing employees, investment in vocational training, sending workers abroad to acquire skills and improving the quality of teachers, trainers and mentors.

[31] For instance, the use of modern information technology to raise skills level has been implemented in particular by oil companies.

[32] For instance, the use of distance learning for skill upgrading has been used mainly in universities, for example, Sudan Open University provide distance education and training for teachers of basic education during their service.

Table 9.18 Human resources development and training policies in the large mixed and private firms in Sudan

Firms	Human resources development strategies and training policies in Kenana sugar company (KSC) and DAL group
1. KSC[a, b, c]	KSC human resources development unit aims to upgrade skill levels via the following 1. Employing about 16,000 workers (half of them are permanent workers) and providing education and healthcare to the 100,000 people who are estimated to depend on the plant 2. Encouraging an active R&D unit and supporting scientific research to be continuously involved in the development of ways and means for utilisation of sugar industry 3. Supporting vocational training through establishment of a centre for vocational training since the founding of KSC 4. Enhancing access to primary and secondary education by adding to the already existing local government schools and non-government religious (khalawis) education in Kenana area. Notably, through the establishment of Kenana Sugar Company primary and secondary schools. This includes KSC 23 basic schools (which includes 11 mixed basic schools, 5 basic schools for boys and 7 basic schools for girls), in addition to KSC 4 secondary schools (which includes 2 secondary schools for boys and 2 secondary schools for girls) in Kenana area 5. Enhancing access to tertiary education and linking education and industry via the following: (a) Establishment of the KSC company branch of Omdurman Islamic University including a number of colleges (b) Contribution of KSC to the establishment of Kenana technical college in Kenana in 2004. Kenana technical college offers technical university education in 8 fields of specialisation that facilitated with the employment of 12 academic teaching staff, 4 technical teachers and 8 technicians. In 2008/09 Kenana technical college offers opportunity for enrolment of 276 students and graduation of 139 students 6. Offering several internal and external (abroad outside Sudan) training programmes for skill upgrading and upskilling of personnel workers. The various internal and external training opportunities are offered for workers to fit with the KSC current and future business and to fit with skills and technical change and needs in the field of industrial and agricultural technology related to sugar manufacture and cultivation 7. Supporting training provision in cooperation with the universities and local institutes 8. Participating in supporting improvement of the quality of teachers by supporting sending some teachers for training in overseas universities 9. Upgrading the level of KSC local skill by bringing foreign experts and integrating them in the company to help the transfer of knowledge and skill to Sudanese through the establishment of company training centre since 1986 to offer various training programmes for upskilling and upgrading the level and capacity of management and technical skills of local staff so as to maintain the overall efficiency of the company 10. Supporting of training via the establishment of the subsidiary Kenana Engineering and Technical Services Company (KETS) since 1989 with the aim to benefit from the experience and knowledge accumulated by Kenana company

(continued)

Table 9.18 (continued)

Firms	Human resources development strategies and training policies in Kenana sugar company (KSC) and DAL group
	to provide engineering and technical services for agricultural and industrial sectors in Sudan 11. Encouraging and supporting strategic partnerships and cooperation with the public sector and state institutions to promote employment for graduates in Sudan. In February 2011, KSC subsidiary company KETSC has signed a partnership agreement with the National Fund for the employment of graduates and the Ministry of Human Resource Development that aim to build in partnership to upgrade the skill levels of graduates. Kenana Sugar Company and National Fund for employment of graduates are working together to facilitate access to further practical knowledge offered to graduates to facilitate their engagement in the work environment via the integrated training programmes in KSC and through temporary absorption of graduates in different provisional projects operated by KSC in industrial and agricultural fields 12. Offering contribution towards the British Council and the Chevening Scholarship scheme (2009–2010). The British Council and the Chevening Scholarship scheme is organised in cooperation with the British Embassy in Sudan and it aims at offering Sudanese nationals with strong academic backgrounds and relevant work experience in the fields of politics, public administration, economics, environmental sciences, law, human rights, international relations, conflict resolution, engineering, development, including rural development and agriculture, an excellent opportunity to study for a 1 year Master's degree in the UK through the Chevening Scholarship scheme
2. DAL Group[d,]	Dal's human resources development unit aims to upgrade skill levels via the following: 1. Attracting, developing, and retaining the talented local and international workers by employing more than 5,500 employees drawn from 26 different nationalities 2. Providing employees with world-class learning and development opportunities 3. Pursuing a long-term vision, plan and strategy for investment in people and providing its employees with a working environment that stimulates diversity, innovation, teamwork, learning and development 4. Focusing on three main core values including commitment for maintaining high personal and business standards 5. Offering specialised training for more than 60,000 people across the country in baking and bread making as part of Dal corporate responsibility activities 6. Offering specialised training via the Dal Sudanese Tractors Company (SUTRAC) training centre, which was the first in Africa and the Middle East to be certified by Caterpillar 7. Enhancing investment and growing human capital through significant investment in learning and development and talent management to achieve the key future initiatives for the company including broadening geographical footprint in the region, deepening product mix and accelerating speed to market through supply chain optimisation 8. Encouraging cooperation with several government bodies (including the Ministry of Agriculture, Department of Forestry, Higher Council for Technical and Vocational Training, Ministry of Education, Ministry of Health and Sudanese Standards Metrology Organisation) to promote better standards and create opportunities

(continued)

Table 9.18 (continued)

Firms	Human resources development strategies and training policies in Kenana sugar company (KSC) and DAL group
	9. Supporting the Dal group individual businesses further initiatives to enhance learning and capacity building
	10. Encouraging an active R&D unit via supporting involvement in several activities, introducing new products, processes and exploring opportunities, trailing new technologies and adapting ideas, to develop new products and services, which meet the needs for development in Sudan
	11. Supporting education through DAL Group initiative of establishment of Khartoum International Community School (KICS) in 2004. Founded by DAL Group, KICS is the first and only school to offer the highly acclaimed International Baccalaureate (IB) in Sudan. KICS provides a first world-class international education to the local and international communities in Khartoum. The Dal Group KICS offers enrolment for 400 students representing over 30 nationalities. In December 2010 KICS achieved international recognition; KICS has been awarded accreditation by the prestigious Council of International Schools. This was achieved only 5 years after the opening of the school. The award of CIS accreditation is an internationally recognised quality mark showing that KICS is a school that aspires to the highest possible standards. KICS is the first and only school in Sudan to have achieved both CIS accreditation and authorisation by the International Baccalaureate to offer the IB Diploma and Primary Years programmes in Sudan
	12. Improving human resources effectiveness within the DAL group by supporting several strategic initiatives. These include firstly, strategic workforce planning to ensure that the organisation has access to the necessary resources to fulfil the strategic business objectives, also this includes identifying and monitoring key workforce information and modelling future requirements. Secondly, talent management to focus on recruitment and retention of employees, succession planning, and Dal graduate and future leaders programmes. Thirdly, Learning and Development (L&D) to enhance the knowledge, skills and attitudes of employees through a range of activities from specialist courses and on the job training, to work shadowing and mentoring. DAL Group has invested in a world class L&D centre to ensure its employees receive the best possible professional development. Fourth, performance management and rewards to create and maintain a performance management and appraisal system that encourages a performance driven culture, with rewards based on performance
	13. Adopting and supporting the involvement in corporate responsibility (CR) strategy by ensuring that social contribution and responsibility is integrated into Dal everyday business activities and through Dal heavily investment in learning and development and in programmes that seek to identify and promote talent throughout the group
	14. Encouraging investment in Sudanese youth graduate by offering a month long work placement opportunities for graduates, university and vocational education students
	15. Offering pre-employment training for Sudanese graduate through the recent launch of graduate trainee scheme, whereby 14 graduates (selected from more than 900 applications) have joined Dal Group's specially designed 2 year programme exposing them to a variety of businesses and roles across the group
	16. Involving in offering awards for best Sudanese secondary school graduates to encourage competition and positive impact in society. Dal Group subsidiary company Sayga has introduced the initiative of the Sayga Al-Awal Annual

(continued)

Table 9.18 (continued)

Firms	Human resources development strategies and training policies in Kenana sugar company (KSC) and DAL group
	Award, 'Al-Awal honours the First'. The Al Awal initiative is one of several of Sayga's CR projects that have been integrated permanently into the business strategy. The award initiative programme started 2 years ago in 2009 when top achieving Sudanese secondary school graduates were sent to the UK. Sayga promotes and rewards excellence by celebrating and recognising the top achieving student in each of the fields of the Sudanese High Secondary School Certificate (graduates from the academic, commercial, agricultural, and industrial and women specific studies). The initiative aims to instil a sense of competition in high schools, to reward students' effort and achievement, expose them to different cultures, strengthen English language command, increase self confidence and enhance skills of top Sudanese students. The Al-Awal Initiative involves organising and sponsoring a 1 month trip to the UK to attend intensive English courses at the Anglo-Continental School of English in Bournemouth, providing internship opportunities within the organisation, providing a Sayga medal and a laptop prize for top achieving Sudanese high secondary school graduates

Sources: Adapted from
[a]KSC Achievement Report, publications and web site
[b]Akhbar Newspaper (2011)
[c]Fadlallah (2006) and
[d]DAL Group Achievement Report (1970–2011), publications and web site: http://www.dalgroup.com accessed 10 April 2011

Further efforts considered important in the long run are to enhance the system or programme of apprenticeships, support long distance learning, encourage the system of accreditation and licensing, sending teachers/instructors and trainers abroad to acquire knowledge and skills and to improve the quality of teachers, trainers and mentors.

On the other side, at the micro level/across firms, the results of the firm survey suggest differing points of view with different priorities that highlight learning on the job as main priority,[33] especially in the short run.[34] Whereas, using ICT to upgrade skill levels, investment in training of existing employees, supporting long distance learning, sending trainers, mentors and workers abroad to acquire skills and knowledge and bringing/attracting new foreign skills, scientists and engineers are receiving less attention, particularly in the short run. Firms highlight these components in the long run and highlight learning on the job in the short run (see Table 9.20 below).

From Tables 9.19 and 9.20 and from the macro-firm surveys it appears that views of the policy makers and experts and those of the firms are consistent in highlighting the learning on the job as one of the top priority for skill development. However, on the other hand, we observe that there appears to be clear discrepancies

[33] As reported by 84 % of the respondent firms.
[34] As indicated by 72 % of the respondent firms.

Table 9.19 Plans and tools for skill development: macro-policy makers and experts view

Tools for skill development (%)	Importance (%)	Has been already implemented (%)	Short run/ current plan (%)	Long run/ future plan (%)
Investment in formal education	97	56	17	17
Investment in vocational training	100	44	17	28
Investment in training of existing employees	100	50	17	25
Improving the quality of teachers, trainers and mentors	100	42	22	25
Sending teachers/instructors/trainers abroad to acquire knowledge and skills	94	36	19	25
Sending students abroad to acquire knowledge and skills	81	33	14	36
Sending worker abroad to acquire skills	92	39	19	25
Bringing/attracting new foreign skills, scientist and engineers	61	39	22	17
Using ICT to upgrade skill levels	97	42	28	11
Encouraging learning on the job	100	33	28	19
Supporting long distance learning	89	42	25	19
Enhancing the system of accreditation and Licensing	86	17	31	31
Enhancing the system or programme of apprenticeship	97	44	14	19
Total response				

Source: Own calculation based on the macro survey (2010)

between the macro–micro views (and also across firms) concerning the selection of both tools and plans for skill development. For instance, the macro/policy makers and experts' view tends to highlight investment in training of existing employees, investment in vocational training, improving the quality of trainers and mentors, encouraging learning on the job and investment in formal education as top priorities. Their next priorities are: using ICT to upgrade skill levels, enhancing the system or programme of apprenticeships, and sending trainers, mentors and workers abroad to acquire skills. Supporting long distance learning encourage the system of accreditation and licensing, sending students abroad to acquire skills and bringing/attracting new foreign skills, scientists and engineers from abroad are viewed as somewhat less important tools. On the other side, the micro (firm) view highlights learning on the job as main priority. The rank of the firms' other priorities are: using ICT to upgrade skill levels, investment in training of existing employees, supporting long distance learning, sending trainers, mentors and workers abroad to acquire skills and knowledge and bringing/attracting new foreign skills, scientists and engineers.

From the policy makers, experts and firms' perspectives the top priorities in the short run are encouraging the system of accreditation and licensing, learning on the job, using ICT to upgrade skill levels, supporting long distance learning, improving

the quality of teachers, trainers and mentors and bringing new foreign skills, scientists and engineers; this is followed by investment in education, training (including vocational training) and sending trainers, mentors and workers abroad to acquire skills. From the policy makers, experts and firms' perspectives the top priorities in the long run highlight sending students abroad to acquire knowledge and skills, encouraging the system of accreditation and licensing, investment in training (including vocational training) of existing employees, improving the quality of teachers, trainers and mentors and sending teachers, mentors and workers abroad to acquire knowledge and skills.

From the macro/policy makers and experts' perspective, the top priorities in the short run are encouraging the system of accreditation and licensing, learning on the job, using ICT to upgrade skill levels, supporting long distance learning, improving the quality of teachers, trainers and mentors and bringing new foreign skills, scientists and engineers. Less emphasis would be placed on sending trainers, mentors and workers abroad to acquire skill, investment in education, training (including vocational training) of existing employees and sending students abroad to acquire skill. On the other side, firms highlight encouraging learning on the job as top short run priority, followed by using ICT to upgrade skill levels, investment in training of existing employees, supporting long distance learning, and bringing new foreign skills, scientists and engineers. Less emphasis would be placed on sending trainers, mentors and workers abroad to acquire skills.

Furthermore, from the macro/policy makers and experts' perspective, the top priorities in the long run would be sending students abroad to acquire knowledge and skills, encouraging the system of accreditation and licensing and investment in vocational training. This is followed by investment in training of existing employees, improving the quality of teachers, trainers and mentors and sending teachers/instructors, trainers and workers abroad to acquire knowledge and skills. Less emphasis would be on supporting learning on the job, supporting long distance learning, enhancing the system or programme of apprenticeships, investment in education, bringing new foreign skills, scientists and engineers and using ICT to upgrade skill levels. On the other hand, firms tend to highlight sending trainers, mentors and workers abroad to acquire skills as main long run priority, followed by investment in training of existing employees, supporting long distance learning and bringing new foreign skills, scientists and engineers. Less emphasis would be placed by firms on using ICT to upgrade skill levels and encourage learning on the job.

In addition to the above observed discrepancies between macro–micro views concerning the selection of plans and tools and arrangement of priorities and policies for enhancing skill, we explain below the visible differences in the macro–micro perspectives in suggesting policies for improving the provision of training and transfer of knowledge. Therefore, this implies that further efforts are needed to enhance the consistency between the macro–micro views and public-private sectors, particularly with respect to the arrangement of priorities and plans to ensure more successful and consistent implementation of policies for skills development and encouraging private sector participation in education and training.

Table 9.20 Plans and tools for skill development: micro-firm view

Tools for skill development	All	Industry				Size		
Response rate	firms	Chemical	Food	Metal	Textile	Large	Medium	Small
Of special importance (%)								
Investing in training to train existing employees	65 %	71 %	63 %	55 %	60 %	78 % %	52 %	67 %
Sending trainers and mentors abroad to acquire skills	49 %	51 %	41 %	64 %	40 %	59 %	44 %	39 %
Sending workers abroad to acquire skills	46 %	49 %	44 %	45 %	40 %	56 %	44 %	33 %
Bringing/attracting new foreign skills, scientists and engineers	33 %	26 %	48 %	27 %	20 %	47 %	26 %	17 %
Using ICT to upgrade skill level	73 %	77 %	70 %	73 %	60 %	72 %	70 %	78 %
Encouraging learning on the job	84 %	92 %	74 %	82 %	80 %	88 %	78 %	84 %
Supporting long distance learning	49 %	60 %	44 %	36 %	20 %	59 %	44 %	39 %
Others [please specify below]								
Number of respondents	79	36	27	11	5	32	27	19
To be pursued now/ in the short run (%)								
Investing in training to train existing employees	32 %	29 %	33 %	27 %	60 %	47 %	19 %	28 %
Sending trainers and mentors abroad to acquire skills	9 %	9 %	11 %	9 %	0 %	3 %	22 %	0 %
Sending workers abroad to acquire skills	15 %	14 %	15 %	18 %	20 %	22 %	15 %	6 %
Bringing/attracting new foreign skills, scientists and engineers	24 %	17 %	30 %	36 %	20 %	34 %	15 %	17 %
Using ICT to upgrade skill level	42 %	40 %	37 %	55 %	60 %	63 %	26 %	28 %
Encouraging learning on the job	72 %	75 %	63 %	82 %	80 %	75 %	67 %	74 %
Supporting long distance learning	26 %	29 %	19 %	36 %	20 %	31 %	22 %	22 %
Others [please specify]								
Number of respondents	78	35	27	11	5	32	27	19
To be pursued in the near future/long run (%)								
Investing in training to train existing employees	44 %	51 %	33 %	55 %	20 %	41 %	52 %	33 %
Sending trainers and mentors abroad to acquire skills	56 %	57 %	48 %	73 %	60 %	72 %	41 %	50 %

(continued)

Table 9.20 (continued)

Tools for skill development	All	Industry				Size		
Response rate	firms	Chemical	Food	Metal	Textile	Large	Medium	Small
Sending workers abroad to acquire skills	51 %	51 %	44 %	64 %	60 %	53 %	52 %	44 %
Bringing/attracting new foreign skills, scientists and engineers	31 %	34 %	33 %	18 %	20 %	41 %	30 %	17 %
Using ICT to upgrade skill level	28 %	37 %	22 %	18 %	20 %	22 %	41 %	22 %
Encouraging learning on the job	16 %	17 %	15 %	18 %	20 %	16 %	19 %	16 %
Supporting long distance learning	37 %	37 %	33 %	45 %	40 %	41 %	37 %	28 %
Others [please specify]								
Number of respondents	78	35	27	11	5	32	27	19

Source: Own calculation based on the firm survey (2010)

9.4.2 Policies and Mechanisms for Skill Development: The Macro–Micro Views

The implementation of the above plans for skills development requires an integration of the macro–micro policies; the results of the macro and firm surveys (2010) are useful for discussing and integrating these policy perspectives. From the macro survey we find that the policy makers and experts' view concerning skill development policies highlights the mechanisms/policies for enhancing the efficiency of educational system, enhancing the external schooling effects/transfer of knowledge and planning skill needs. Additional mechanisms/policies identified include promoting of resources allocation, enhancing social partnership and collaboration between educational and training institutions, employers, workers and the state to determine skill needs and the most effective ways of meeting and financing them, enhancing the provision of training, monitoring skill needs on a regular basis and importing skills from abroad.[35]

Our analysis below discusses the mechanisms for enhancing the educational system, transfer of knowledge/external schooling effects and provision of training. Other components include: planning skill needs, monitoring skill needs on a regular basis, enhancing social partnership in skill development, promoting of resources allocation and importing skill from abroad are somewhat integrated in the above components. We begin with the reform of educational system because we want to argue that both training provision and transfer of knowledge can be enhanced by an efficient educational system.

[35] As reported by 100 %, 100 %, 97 %, 97 %, 97 %, 94 %, 92 % and 75 % of the respondent policy makers and experts respectively.

(a) Reform of educational system

Beginning with the reform of the educational system, Table 9.21 summarises the official view concerning the reform of the educational system, which highlights improvement of internal efficiency/quality of tertiary education, encouragement of modernisation and dynamism in the educational system and enhancing planning for educational need. In addition, the official prioritise the improvement of internal efficiency/quality of basic and secondary education, improvement of the quality of teachers and mentors, improvement of infrastructure, increasing the harmony/consistency between educational output and market needs by focusing on particular future skill needs, increasing public spending on education, increasing spending and incentives to encourage enrolment in technical education, encouraging the system of flexibility of educational institutions and encouraging the use of new technologies for improving education and skill. Further reform measures include monitoring educational needs on a regular basis, increasing motivation for improving education and skill, increasing motivation and incentives to change student attitudes, enhancing the linkages (network) between universities, colleges, technical and training institutes and increasing private sector involvement on education. Additional reform measures include encouragement of apprenticeship education, establishment of the Academy of Educational Sciences and establishment of a national council to establish links between the policies of population, education, training and employment. Further reform measures include provision of free education, increasing awareness of the value of e-learning, periodical review of education policies, development of curriculum to ensure consistency with labour market requirements (consistency between education output and labour market needs), enhancing enrolment in technical education by provision of incentives such as monthly support (bursaries) for students and incentives for technicians employed in government jobs. Finally, we suggest an improvement of duration of compulsory education and autonomy of educational institutions and serious intervention from the government to improve education in all its levels needs.

In recent years, there have been several recent initiatives in Sudan aimed at long-term solutions to develop human resources, reform educational and training programmes and the labour market. For instance, Sudan has established the National Center for Training and Administrative Systems, the Selection Committee for the National Civil Service and the Supreme Council for vocational training and apprenticeships – affiliated to the Sudanese Ministry of Labour, Public Service and Human Resources Development to help improve the skills of Sudanese national workers and help with looking for jobs. For instance, the National Center for Training and Administrative Systems is implementing policies linked and consistent with the government strategies that aim to enhance the development and modernisation of training, development of capacity, development of the civil service, address the gaps in the performance of the civil service, activate and develop the workers training programmes using modern methods of training, planning and determining of training needs and preparation of annual plans and budget for the establishment of training programmes and courses aimed at raising

the skill level of workers in the civil service intermediate cadres and executive managers. Moreover, the Supreme Council for vocational training and apprenticeships is established in 2001 to be responsible of controlling and monitoring of vocational training and apprenticeships. It is implementing specialised policies aimed to develop vocational training and apprenticeships, preparation of plans and vocational training programmes, examine the need for vocational training in different units, the establishment of specialised committees to assist in implementing its duties, the adoption of training curricula for various categories, development of standards and levels of different professional, adopting approach to training of trainers and observers and any other categories, cooperation to arrange and conduct vocational and professional performance testing, encourage research in all vocational training and apprenticeships fields, certification of national vocational training and apprenticeship certificates or any other certificates.[36] In our view, these recent initiatives would be more effective if the government in Sudan collaborates with the private sector to work actively to influence both the supply and demand sides by implementing more effective policies to increase incentives, for example, through subsidies to improve both education and training. For instance, public policies can influence the demand side for education and change the low enrolment ratios at the tertiary level, especially technical education, by providing more fellowships, scholarships and prizes for engineering and science students, and increasing incentives for students to increase attraction for enrolment into science and engineering at secondary schools levels. The government should continue to upgrade schooling and increase enrolment at all levels, especially in higher education.

In our view Sudan can benefit from the experiences of other advanced countries to improve the coordination and planning to avoid the mismatch between supply and demand and to meet critical skills needs. For instance, Sudan can benefit from the experiences of the European countries, where the government limits itself to pay teachers' salaries and leaves the coordination problem to employers' federations. Sudan should continue to upgrade schooling and increase enrolment in all levels especially in higher education and should also induce firms to organise in a federation, which has the task to organise branch specific education, by using taxes as a stick and the payment of teachers' salaries as a carrot.

(b) Enhancing the transfer of knowledge/external schooling effect

The reform of the educational system is expected to have a direct positive effect on motivating/enhancing the transfer of knowledge/external schooling effects. For instance, Table 9.22 shows that the macro–micro views highlight the potential positive implications of improving the qualifications of skilled and unskilled workers, the quality of education and training in enhancing the transfer of knowledge/external schooling effects. Furthermore, from the official perspective, other important factors

[36] See: http://www.mol.gov.sd/index.php?option=com_content&view=article&id=16&Itemid=10, accessed 21 March, 2011.

Table 9.21 Policies and mechanisms for skill development: (a) macro/official view: Reform of educational system

Macro policies and mechanisms for enhancing the efficiency of education system	(%)
Improve the quality of teachers or mentors	97
Encourage the system of modernization and dynamism	100
Improve the infrastructures	97
Better planning for educational needs	100
Improve the internal efficiency/quality of basic education	97
Improve the internal efficiency/quality of secondary education	97
Improve the internal efficiency/quality of tertiary education	100
Enhance the linkages [networks] between universities, colleges, technical and training institutes	92
Monitoring educational needs on a regular basis	94
Encourage the system of flexibility of educational institutions	97
Increase the harmony/consistency between educational output and market needs by focusing on particular future skill needs	97
Increase public spending on education	97
Increasing the motivation and incentives to change the attitudes of educated economically active population	94
Increase spending and incentives to encourage enrolment in technical education	97
Increase private sector spending and involvement on education	86
Encouragement of the use of new technologies for improving education and skill	97
Increase motivation for improving education and skill	94
Total response	

Source: Own calculation based on the macro survey (2010)

for enhancing the external effect of schooling include enhancing the role of personal internal motivation and leadership in raising the level of skills, the relevant selection of more appropriate trainees for internal and external training programme to acquire training that match with their skills and enable them to transfer a positive external effect in their institutions. Moreover, from the firms' perspective the other important factors for enhancing the external effects of schooling includes provision of incentives, supporting provision of training opportunities at all levels of at the firms and supporting stability and continuity of workers in the firms. The macro–micro views differ with respect to the potential effect of improving firm conditions to encourage external effects and sponsoring educational scholarship. In addition, the macro survey shows that the policy makers and experts' view highlight the importance of improvement of awareness for enhancing the incidence and the transfer of knowledge/external schooling effect. Moreover, the macro survey shows that the policy makers and experts' view indicates that the transfer of knowledge/external schooling effect can be motivated via minimisation of education, learning and training costs in addition to increasing the interaction to market needs and increasing the information about future educational, training and skill needs in the productive sectors. There is also a need to increase awareness about the future value of investments in education and training to minimise the risk aversion: preference of more certain short term returns to available jobs than long-term skill investments.

Both the provision of adequate incentives for trainers and enhancing a system of certification of skills acquired are expected to have somewhat less important potential effects in the transfer of knowledge/external schooling effect.[37]

(c) Enhancing training provision

From the macro-firm surveys it appears that views of the policy makers and experts and those of the firms are consistent in highlighting the reform of educational system as an important mechanism to improve the provision of training, and the reform of educational and training systems for the enhancement of knowledge transfer/external schooling effects. However, on the other hand, there appears to be clear discrepancies between the macro–micro views (and also across firms) concerning the arrangement of priorities of other mechanisms for improving the provision of training. For instance, Table 9.23 presents the policy makers and experts' view to improve the provision of training that highlights enhancing training programmes to fit the changing technical needs, regular/adequate assessment and monitoring of training needs and improving the quality of trainers and mentors. Other measures towards enhancing planning for training needs, include: increasing the appreciation of/information on the benefits of training, enhancing the availability of finance to cover training costs, improve quality, efficiency and comprehensiveness and modernity of training programmes and enhancing the interactions between training institutions and firms, are also highlighted. Further, measures aimed at enhancing the educational qualifications of workers, enhancing the specialised training institutions, enhancing the appropriability of the return from investment in training, increasing the availability of training materials and equipment, increasing availability of trainers and mentors, enhancing training programmes to fit the changing skill needs, enhancing the system of training certification, increasing the participation of private training institutions and decentralisation of decision-making, are also mentioned. Furthermore, from the firms' perspective others enhancing factors for provision of training includes the promotion of awareness, encouragement of modernisation and development amend the restricting laws, reduce government control and censorship, enhancing adequate availability of trainers rather than restricting the movement of trainers and trained persons.

Moreover, from the official perspective, the other important factors for enhancing training include linking training by administrative development for staff, making training a prerequisite for career advancement, increasing the financial rate of return from training for the participants during the training period and after obtaining a certified training, enhancing continued practical training, encouraging training institutions to adopt certificates of competency and quality from international centres of excellence and finally increasing government concern for prioritising training by prioritising financing training and human resources

[37] As indicated by 97 %, 94 %, 94 %, 92 %, 89 % and 89 % of the respondent policy makers and experts respectively.

Table 9.22 Policies and mechanisms for skill development: (b) macro–micro views: factors enhancing the transfer of knowledge/external schooling effect

Factors enhance external schooling effect/knowledge transfer	All firms	Chemical	Food	Metal	Textile	Large	Medium	Small	Official
Improves the qualifications and ability of unskilled workers to learn from skilled workers	87 %	89 %	85 %	80 %	100 %	94 %	88 %	72 %	100 %
Improves the qualifications of skilled workers to permit the positive effects on unskilled workers	88 %	86 %	89 %	90 %	100 %	87 %	96 %	78 %	100 %
Improves the quality of training to coincide with international standard	82 %	83 %	78 %	80 %	100 %	84 %	81 %	78 %	97 %
Improves the quality of education	82 %	86 %	74 %	80 %	100 %	87 %	81 %	72 %	97 %
Improves firm conditions to encourage the external effects	82 %	86 %	81 %	60 %	100 %	84 %	73 %	89 %	97 %
Sponsors educational scholarship	74 %	80 %	67 %	60 %	100 %	74 %	77 %	72 %	100 %
Improves firm selection in both recruitment and termination	74 %	77 %	70 %	60 %	100 %	74 %	73 %	78 %	92 %
Improve awareness of the importance of external effect									100 %
Total response	76	35	27	10	4	31	26	18	

Sources: Own calculation based on the macro survey (2010) and firm survey (2010)

development apart from current government strategy that focus in prioritising financing roads, bridges, dams, etc.

The firms' view indicates that the provision of training could be improved by enhancing educational qualifications of workers, increasing the appreciation of/information on the benefits of training, enhancing training programmes to fit the changing technical needs, enhancing the availability of finance to cover training costs and enhancing encouraging the specialised training institutions. Mechanisms

such as, increasing availability of trainers and mentors, enhancing the availability of training materials and equipment, enhancing the system of training certification and restricting the mobility of trainers are viewed by the firms as being of somewhat less importance. That also holds for regular/adequate assessment and monitoring of training needs, and enhancing planning for training needs, enhancing the interaction between training institutions and firms, enhancing training programmes to fit the changing skill needs, improving the quality of trainers and mentors and enhancing the appropriability of the return from investment in training. Since training is costly, firms prefer policy interventions to finance training; however, it is less clear to what extent firms have a sound policy to contribute to training costs, as only 54 % of all respondent firms have upskilling plan (see for instance Chap. 5 above).

Our findings in this research are consistent with the findings of Suleiman (2007). For instance, Suleiman (2007) argues that the good provision of training required the provision of sufficient resources to meet all the needs of the Sudanese economy by enhancing the provision of training and variety of skills for the labour force in Sudan. In addition to the need to benefit from the technical assistance offered by friendship cooperation agreements with partner countries that in the past have been already long established in the field of vocational training for instance, in the past Germany has offered a good contribution to vocational training. Furthermore, the training in business management in various specialties requires cooperation to be undertaken between the public official bodies in charge of training with the private sector to provide a significant contribution to training in management according to the needs, in addition to investment incentives to encourage investors to train skilled workers, and by linking them with the quantity and quality achieved by the training facility for Sudanese workers. Finally, it is important to point out the importance of broadening and deepening the training of teachers by establishing institutes for education, especially in rural areas as one of the necessary steps to improve the quality of primary and secondary education, as well as considering training of Sudanese women. Suleiman (2007) notes that it is true that there are faculties of education in some universities in Sudan, but these colleges focus mainly on the theoretical, while the training of teachers needs more focus on the practical or applied sides. Therefore Suleiman (2007) indicates that it is necessary to create several institutes to train teachers at different levels of education and curriculum in order to achieve all goals of education, based on the lessons to be learned from the rich experiences of the Bakhtelrdah Institute, which was established in 1964 and enables the connection between teacher training and curriculum reform and scientific research in the development of primary and intermediate education. Suleiman (2007) believes that for a better future for training in Sudan, the country needs to start sooner in the preparation of these trainers both internally and externally through scholarships – each according to his qualifications and the type of training will do in the future (Suleiman 2007: 112, 114–115, 117).

Finally, in view of the complementary relationship between skills, skill upgrading and technological progress (see Chapter 7 above), the development of education, training, transfer of knowledge and skill levels may have further positive

Table 9.23 Policies and mechanisms for skill development: (c) macro–micro views: promotion of training

Policies intervention for enhancing training provision	Official	All firms	Chemical	Food	Metal	Textile	Large	Medium	Small
Enhancing the educational qualifications of workers	94 %	86 %	83 %	91 %	75 %	100 %	96 %	84 %	71 %
Enhancing the availability of training materials and equipment	94 %	71 %	83 %	67 %	50 %	75 %	87 %	63 %	62 %
Enhancing training programmes to fit the changing technical needs	100 %	78 %	78 %	81 %	88 %	33 %	86 %	74 %	69 %
Increasing the appreciation of or information on the benefits of training	97 %	81 %	87 %	82 %	75 %	50 %	87 %	79 %	71 %
Regular/adequate assessment and monitoring of training needs	100 %	69 %	83 %	67 %	50 %	33 %	86 %	53 %	69 %
Improving the quality of trainers and mentors	100 %	64 %	70 %	67 %	50 %	50 %	78 %	53 %	62 %
Enhancing training programmes to fit the changing skill needs	92 %	65 %	70 %	71 %	50 %	33 %	86 %	58 %	46 %
Increasing availability of trainers and mentors	94 %	71 %	74 %	67 %	75 %	75 %	87 %	58 %	69 %
Enhancing adequate planning for training programme/needs	97 %	69 %	78 %	67 %	63 %	33 %	82 %	63 %	62 %
Enhancing the availability of finance to cover training costs	97 %	76 %	83 %	81 %	50 %	67 %	86 %	74 %	69 %
Enhancing/encouraging the specialized training institutions	94 %	76 %	83 %	81 %	63 %	33 %	91 %	63 %	77 %
Enhancing the interactions between training institutions and firm	97 %	67 %	70 %	76 %	50 %	33 %	82 %	58 %	62 %
Enhancing the full appropriability of the return from investment in training	94 %	62 %	70 %	62 %	38 %	67 %	73 %	58 %	54 %
Enhancing the system of training certification of skills acquired	89 %	71 %	78 %	67 %	75 %	33 %	82 %	63 %	62 %
Increasing the participation of private training institutions	89 %								
Decentralization of decision-making	75 %								
Restriction the mobility of trainees	%	71 %	83 %	71 %	50 %	33 %	82 %	63 %	69 %
Improve quality, efficiency and comprehensiveness and modernity of training programmes	97 %								
Total response		57	23	22	8	4	23	19	14

Sources: Own calculation based on the macro survey (2010) and firm survey (2010)

implications on the development of local technologies. Accordingly, the promotion of local technologies depends on skill upgrading, the promotion of R&D activities and enhancement of networks systems, collaboration between universities, firms, public and private sectors and the implementation of an explicit technology policy.

Therefore, our findings in this section support our three hypotheses presented in Sect. 9.1 above. We verify our first hypothesis that Sudan needs to upgrade skill through the relevant policies for enhancing educational system, provision of training and transfer of knowledge/external schooling effect at the macro–micro levels. We prove our second hypothesis that the educational reform will have positive implications on: (a) enhancing training provision; (b) skill upgrading; (c) planning skill needs and matching educational output with the needs in the labour market; (d) enhancing the transfer of knowledge/schooling effect; and (e) collaboration between public and private institutions. Finally, we confirm our third hypothesis that the effective institutional environment: consistent policies of public and private institutions will enhance upskilling plan and skill development.

9.5 Conclusions

In this chapter we use some secondary data and information and the macro and firm surveys (2010) to analyse the educational, training and skill development policies in Sudan. We prove our hypothesis 8 in Chap. 1 above that Sudan's needs to enhance skill upgrading through the reform of the educational and training systems/policies and the transfer of knowledge. In particular, we show that skill development depends on: (a) reforming the educational system; (b) enhancing the provision of training; (c) planning skill needs and matching educational output with market needs; (e) enhancing the transfer of knowledge/schooling effect; and (d) incentives and collaboration between public and private institutions. We explain that the promotion of local technologies and adoption of appropriate foreign technologies and the interaction between both these to foster economic growth in Sudan depends on skill development. Particularly, on an enhancement of: (a) skill upgrading: educational and training systems; (b) R&D activities; (c) the transfer of knowledge/schooling effect; (d) networks system; and (e) incentives to motivate collaboration between universities and firms and between public and private institutions.

Our findings in Sect. 9.1 show that despite the enormous variations with respect to the supply and demand sides of educational policies, the educational policies in Sudan and Arab and Gulf countries share several problematic features such as an insufficient duration of compulsory education, the dominance of public sector and the lack of incentives/marginal contribution of the private sector on educational investment. Additional problems include poor quality, insufficient demand (enrolment ratios), an insufficient supply (spending) and the biased structure of tertiary education. We find that the priority of investment in education, as measured by public expenditures on education as a percentage of total government expenditures

the priority of investment as a percentage of GDP in Sudan lags far behind the level prevalent in the Arab and Gulf countries and the level of developed countries.

Our results show the low commitment to the standardised international adequacy, equity and efficiency criterion related to the supply and demand sides of educational policies. We explain the low commitment to the standardised international adequacy criterion in the supply and demand sides. On the supply side, the low commitment to the standardised international adequacy implies the allocation of less than 8 % of GDP on education and less than 20 % of total government or public spending on education and in the demand side the low commitment to the standardised international adequacy implies the inadequacy in intake and enrolment rates in primary and secondary education, gender equity in enrolment in education and literacy rate of population. Furthermore, we then discuss the equity criterion, which implies the equal distribution and allocation of financial resources to achieve the balance between the different education sectors and between different geographical rural and urban areas. Moreover, we then examine the international efficiency criterion which implies that low efficiency often appears from the low rates of attendance, high rates of dropout, high rates of repetition, weak rates of success in final exams, low rates of trained teachers and over-crowded classrooms as indicated by the rate of students enrolment per education institutions.

Moreover, we explain that it is probably plausible to interpret the observed regional disparity in the share in demand and enrolment in education due to demographic reason (as measured by the share in total population), economic reasons (as measured by per capita income and poverty rate) and other reasons (as measured by the degree of urbanisation) across the main regions in Sudan. Starting with the demographic reason, our results can be used to argue that the share in total population seems to be the first important factor determining the share and regional disparity in enrolment in education. Moreover, our findings can be used to argue that the economic reasons as measured by per capita income and poverty rate seem to be the second important factor that determining the share and regional disparity in enrolment and demand for education. Notably, our results imply that the incidence of high poverty rate seem to be the most important factor determining or limiting the demand and enrolment, notably, in basic education. These findings imply that especially among the poor regions, economic reasons were considered to be the most important factor limiting poor students and especially, girls' potential to complete their primary (basic), secondary and tertiary education and that region economic problems impact more negatively on female than on male education. These results imply that the increase in the incidence of poverty and the low per capita income limited or led to low demand and enrolment in education across the main, notably, poor region and this probably interpret the regional disparity in the demand for education across the main regions in Sudan. In addition, our findings can be used to argue that the degree of urbanisation is the third and other factor determining the share and regional disparity in enrolment in education. The major policy implication from our findings is that Sudan has the potential to achieve equity and fulfil the second and third MDG on universal access to primary education and gender equality respectively through reduction and elimination of poverty, notably,

across the poor regions and poor population in Sudan, and this implies achievement of equity and international commitment to fulfilment of UN MDG in Sudan

We observe that while the educational policies in Sudan and the Gulf countries have raised enrolment ratios and literacy rates, they have failed to show satisfactory outcomes with respect to access to schooling/school life expectancy and training. This is due to serious deficiencies concerning the quality of education, coupled with the serious problems of biased structure and inadequate spending and enrolment in tertiary education in these countries. Hence, the major policy implication from our findings is that the improvement of the educational policies in Sudan and Gulf countries is vital and requires an improvement in the quality/internal efficiency, in the supply (investment) and demand (enrolment) sides, particularly in tertiary and technical education, and encouraging private sector investment in education.

Our results in Sect. 9.2 explain the major characteristics of training policies, in particular the structure and pattern of training policies and the impacts of education policies on training policies and skill upgrading in Sudan. First, we observe the biased structure in terms of type, duration and specialisation pattern of training policies and the low commitment to efficiency, adequacy and equity criterion in the provision of training and under utilisation of capacity of training centres all of which most probably critically undermined the efficient provision of training and led to limited effect of training in upgrading skill level for the labour force, this observable from the low share of trained labour force out of total labour force in Sudan. Next, we show that the implication and interaction between educational and training policies seem to be effective but limited to only within the largest two mixed and private firms, which appear more committed to implement skill upgrading policies that are consistent with the line of public policies. These two largest mixed and private firms successfully contribute to serve public policies of training and skill upgrading via establishing active human resources development units, recruitment policies and specialised training centres to implement various regular and special internal and external training programmes, especially for national workers. In addition they encourage the use of ICT to upgrade skill levels, offer scholarships and collaborate with universities to absorb young national graduates. These results support our earlier findings in Chap. 5 above, which indicate a lack of effective interaction between educational and training policies and a lack of incentives for provision of training within private firms. Hence, these findings imply a further duality/discrepancy at the micro level/across small-medium and large private firms.

In Sect. 9.3 we use the results of the macro and firm surveys (2010) to integrate the divergent macro–micro views concerning plans and mechanisms for skill development in the short and long run and propose some policies and recommendations. The short run plans include encouraging the system of accreditation and licensing, learning on the job, using ICT to upgrade skill levels, supporting long distance learning, improving the quality of teachers, trainers and mentors and bringing new foreign skills, scientists and engineers; this is followed by investment in education, training (including vocational training) and sending trainers, mentors and workers abroad to acquire skills. The long run plan highlights sending students abroad to

acquire knowledge and skills, encouraging the system of accreditation and licensing, investment in training (including vocational training) of existing employees, improving the quality of teachers, trainers and mentors and sending teachers, mentors and workers abroad to acquire knowledge and skills.

The policy makers and experts' view concerning the reform of the educational system highlights improvement of internal efficiency/quality of tertiary education, encouragement of modernisation and dynamism in the educational system and enhancing planning for educational need. They also prioritise the improvement of internal efficiency/quality of basic and secondary education, improvement of the quality of teachers and mentors, improvement of infrastructure, increase in the harmony/consistency between educational output and market needs by focusing on particular future skill needs, increase in the public spending on education, increase in the spending and incentives to encourage enrolment in technical education, encouragement of the system of flexibility in educational institutions and encouragement of the use of new technologies for improving education and skill. Further reform measures include: monitoring educational needs on a regular basis; increasing motivation for improving education and skill; increasing motivation and incentives to change student attitudes; enhancing linkages (network) between universities, colleges, technical and training institutes; and increasing private sector involvement in education.

Moreover, the macro–micro suggestions with respect to knowledge transfer/external schooling effects stress the improvement of quality of educational and training systems, qualifications of skilled and unskilled workers. In addition, recommendations include increasing information about future skill needs and the value of investments in education and training, interaction/consistency to market needs and a certification system and improvement of awareness for enhancing the incidence and the transfer of knowledge/external schooling effect.

Moreover, the macro–micro views regarding improvement of the provision of training vary in arranging priorities, but generally emphasise enhancement of training programmes to fit both the changing skill and technical needs, enhancing planning for training needs and quality and availability of trainers and mentors. Other measures include enhancing of training materials and equipment and educational qualifications of workers, assessing and monitoring of training needs regularly/adequately, increasing appreciation of/information on the benefits of training, enhancing availability of finance to cover training costs and enhancing specialised training institutions.

Therefore, our findings in this paper support our hypothesis 8 presented in Chap. 1 above. We verify part of our hypothesis 8.a that Sudan needs to upgrade skill through the relevant policies for enhancing educational system, provision of training and transfer of knowledge/external schooling effect at the macro–micro levels. We prove part of our hypothesis 8.a that the educational reform will have positive implications on: (a) enhancing training provision; (b) skill upgrading; (c) planning skill needs and matching educational output with the needs in the labour market, (d) enhancing the transfer of knowledge/schooling effect; and (e) collaboration between public and private institutions. Finally, we confirm our hypothesis 8 that

the effective institutional environment and consistent policies of public and private institutions will enhance upskilling plan and skill development.

In addition, in view of the complementary relationship between skills, skill upgrading and technological progress (see earlier discussion in Chap. 1 above) the development of education, training, transfer of knowledge and skill levels may have further positive implications on the development of local technologies. Accordingly, this proves the second part of our hypothesis 8.b that the promotion of local technologies depends on skill upgrading, promotion of R&D activities and enhancement of networks system, collaborations between universities, firms, public and private sectors and the implementation of an explicit technology policy

Finally, our results show a serious discrepancy between small-medium and large private firms regarding the implementation of public policies of training and skill upgrading and also divergent macro–micro views concerning the arrangement of priorities to implement plans, mechanisms and policies for enhancing skill, provision of training and transfer of knowledge. Therefore, we recommend further efforts to be made to enhance the consistency between the macro–micro views and public-private sectors, particularly with respect to arrangement of priorities, plans and mechanisms to ensure more consistent, effective and successful policies for skill development and encouraging private sector participation in education and training. We find that the percentages of female students in all levels of education in Sudan are low compared to most other Arab countries. So, more efforts are required to improve the percentage of female student enrolment ratio for all levels of education in Sudan and Arab countries.

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