

A REVIEW STUDY OF TECHNICAL EDUCATION IN THE DEMOCRATIC REPUBLIC OF SUDAN

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Abstract

The qualifying of the Technician needs several capabilities such as establishing laboratories and specialized workshops, preparation and qualifying of instructors and trainers; and updating and review of the curricula in accordance with the needs of the labor market and development.

The challenges that Face technical education in Sudan could be summarized in the following: Improvement of the ratio of Diploma to B.Sc. graduates, technical and academic financing through government , foreign donations, private sector , and trainee fees , capacity building of teachers and trainers, job description specification for each specialization, development of curricula to suit the labor market, improving the quality and quantity of technical education, flexibility in admission, diversification of programs, and encouraging students to be enrolled in this kind of study.

There are considerable opportunities for developing a diverse array of marketable and apprenticeable trades specific to Sudan which can contribute to sustainable development and post democratic transformation reconstruction. There is no doubt that technical education is crucial if local people are to participate in nation-building and benefit from expanding market activity in Sudan [1] – [24].

Keywords

Historical Background, Current Situation, Technical Education, Vocational Training

I. INTRODUCTION

A. Study on Vocational Training System Development in the Republic of Sudan

This research proposes a master plan for the year 2019 to improve the vocational training system in Sudan. It also identifies the action plans to develop the capacity of the Supreme Council for Vocational Training and Apprenticeship (SCVTA) and Vocational Training Centers (VTCs) as well as other relevant organizations. Socio-economic environment will continue to change. This research study, therefore, is subject to review and revision from time to time so as to update the targeted year [25].

A.1 Evolution of Vocational Training System Development: The current vocational development system is a consequence of a trial and error process for half a century. The process can be divided into the following four phases. Figure 1 below shows the evolution of vocational Training development in Sudan (source: JICA study team).

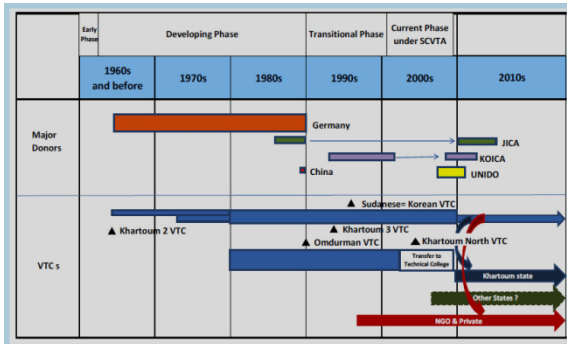


Figure 1 Evolution of Vocational Training Development in Sudan (Source: JICA Study Team)

(1) Early Phase (Before 1963): A full-fledged vocational training started upon national independence. Khartoum 1 Vocational Training Center (VTC) was established in 1956.

(2) Developing Phase (1964-1989): In 1964, West Germany at the time started to assist vocational training in Sudan. An emphasis was given to apprenticeship training. With German assistance, Khartoum 2 VTC was created. At the same time, about 200 instructors were trained in West Germany. VTCs started operation in states as well. In 1974, the government amended Vocational Training and Apprenticeship Act and established training standards. The standards have been a base for setting training courses and curricula. Institute of Training of Trainers and Supervisors (ITTS) was established in 1987. In those days, about 50 trainers were trained in Japan. The vocational training system was, thus, rapidly developed with supports by a number of donors. In 1989, however, Germany interrupted all the ongoing assistance programs for its stated reason that civil wars were continuing.

(3) Transitional Phase (1990-2000): The interrupt of the German assistance gave a shock on the vocational training system.

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However, it kept expand in the early 1990's. VTCs started in Nyala and El Obeid with technical assistance from International Labor Organization (ILO). Omdurman VTC started with a loan by Chinese government. The government of Republic of Korea assisted the establishment of Sudanese-Korean VTC. It also launched an instructor training project. Meanwhile, Khartoum 3 was established by own effort of the Sudanese government.

Without major donors, however, many VTCs began to suffer from the difficulty in maintaining equipment, instructors and curriculum.

According to the national decentralization policy adopted in 1993, Khartoum 1 VTC was transferred from the Federal Government to the Khartoum State Government. Many other VTCs were similarly transferred to state governments. However, the state governments found it financially and technically difficult for them to maintain VTCs. State VTCs were mostly transferred back to the Ministry of Higher Education. They restarted as technical colleges. The late 1990s saw new trends in the national economy. Oil export started. Government run enterprises began to be privatized. These trends stimulated the demand for vocational training to expand. It is in this period that private VTCs emerged.

(4) Current Phase under SCVTA (2001-till now): In 2001, the Government revised the Vocational Training and Apprenticeship Act, in view of the decentralization policy, the favorable economic trend and the privatization policy. Accordingly, the government created Supreme Council for Vocational Training and Apprenticeship (SCVTA). It was chaired by Labor Minister

and attended by representatives from the relevant line ministries, the private sector and nongovernmental organizations.

Despite that the organizational set-up was reinforced, many VTCs continued to suffer from the difficulty in maintaining equipment, instructors and curriculum. On the other hand, vocational training was faced with new groups to be given training opportunities: the Internally Displaced People (IDP) estimated at 4 million in total and the demobilized soldiers estimated at 90,000. Under the circumstances, Korean Government assisted the vocational training in selected field such as automobile and electricity. EU/UNIDO assisted Khartoum State Government in Competence Based Training (CBT) with a focus on rapidly absorbing IDP in the labor market.

The review above suggests that present vocational training system has been made possible to grow and survive largely with international donors. However, one could little longer expect a long-term and comprehensive assistance as ever provided by Germany. The ongoing vocational training system needs to be more self-reliant and sustainable. The review also suggests that diversification has been observed in job seekers, employers and training providers. The ongoing vocational training system needs to tailor itself to the diversification. It is, therefore, necessary to reexamine the role of SCVTA in vocational training, from the viewpoint of sustainability and the flexibility to the diversification.

B. Development Potentials of Vocational Training System

B.1 Steadily Expanding Demand for Skilled Workers

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Demand for skilled workers is steadily expanding, as the national economy has been expanding and being diversified. People's life is stabilized and domestic market is expanding thanks to an end of the civil wars. The national economy is expanded and diversified by petroleum export, import of various consumption goods and infrastructure investments.

These have stimulated the demand for maintenance and repair of goods in small as well as large enterprises. This trend has resulted in a growing demand for the skilled workers engaged in not only production but also the maintenance of factories.

Infrastructure investments have been accelerated with oil export revenues. Highway development has expanded the demand for maintenance and repair of transport equipment and distribution facilities. It has also stimulated real estate development and construction activities. Electric power development has expanded the demand for electric appliances. Many factories have been changed from man-operated to machine-operated. All these have contributed to the demand increase for skilled workers.

Information and communication tools have spread dramatically and encouraged skilled labor to increase for the maintenance of such tools.

Reorganization of public enterprises is also creating skilled employment opportunities through outsourcing.

B.2 Huge Gap in Supply-Demand of Labor

Unemployment rate is estimated at 17% by Ministry of Labor in the Annual Statistical Report 2006 of Central Statistical Office.

There are a huge number of job seekers,

including the young people, IDP, women and demobilized soldiers. Figure 2 below show the unemployment rate of Sudan and neighboring countries (1996 – 2005) (source: UNDP, Human Development Report 2007/2008).

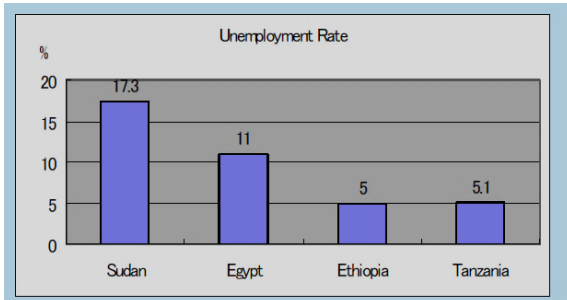


Figure 2 Unemployment Rate of Sudan and Neighboring Countries (1996 – 2005) (Source: UNDP, Human Development Report 2007/2008)

However, a large gap exists between demand and supply of labor. It is partly due to a bias toward general higher education. There is a surplus of managerial, administrative or clerical workers on one hand and a shortage of engineering, technical or skilled workers on the other. The large gap is partly due to the incoming of foreign workers and outgoing of Sudanese workers. Another factor for the gap is the rural-to-urban migrants caused by civil wars and draughts. They have hardly been absorbed in labor market. A major part of them is the IDP of about 2 million living in the surroundings of Khartoum.

B.3 Signs of Reorganization in Technical and Vocational Education and Training (TVET)

There is a new trend in TVET policy. Higher technical education receives a strong policy support. National Council for Technical and Technological Education (NCTTE) has been created to streamline the ongoing technical education system under

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the chairmanship of the Federal Vice-President.

Private VTCs are rising in Khartoum. They are more responsive to labor market changes, more efficient and closer to companies, than public VTCs.

At the community level, vocational training is actively carried out by NGOs, including Youth Council and Islamic network. Khartoum State attempts to apply these experiences to the government vocational training with a technical support of UNIDO.

B.4 Potential Assets of the SCVTA and VTCs

Under the trend above, the SCVTA and VTCs have rather been lagging. They have, however, accumulated the assets that could intensively and selectively be mobilized. Their apprenticeship training offers a distinct career path for the young people who do not enter higher education. The number of applicants exceeds enrolment by several times in many courses of the apprenticeship training. The VTCs maintain a bunch of serious and long-experienced instructors. They are important human resource for private VTCs, too. SCVTA controls trade testing and certificate provision, thereby possibly influencing the whole labor market. ITTS is also strength of SCVTA. It has recently been used for the VTCs other than those under SCVTA (Figure 3 below).

The SCVTA and VTCs have maintained linkages with enterprises, NGOs, private VTCs and international organizations, through senior members of its staff. They also have long experience of cooperation with international development partners, including EU, Germany, ILO, India, Japan,

Korea, UNDP, UNIDO, USA and the World Bank.

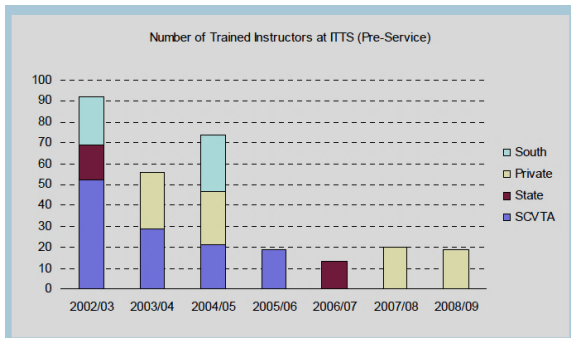


Figure 3 Recent Pre-service Training Programs in ITTS (Source: ITTS)

C. Issues Facing the SCVTA and VTCs

In spite of these potentials for vocational training, the SCVTA and VTCs have been facing with a number of issues: Figure 4 below shows the problem structure facing the SCVTA and VTCs (Source: JICA Study Team).

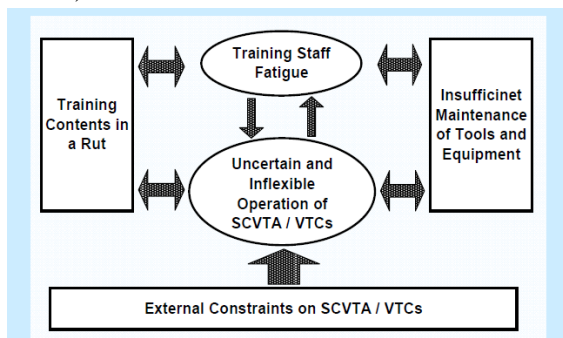


Figure 4 Problem Structure (Source: JICA Study Team)

C.1 Mismatches between the SCVTA and VTCs and the Society

There are mismatches between the SCVTA and VTCs and what the society needs, though it is difficult to measure the mismatches. Many private companies demand more reliable skills and knowledge than those possible to teach within the existing VTCs.

Meanwhile, the SCVTA and VTCs have not explicitly met with the skill and knowledge required by small industries, despite that they represent more than 90% of a total

number of establishments. For example, owners and workers of small industries require not only skills but also business knowledge such as costing and product market, while skilled workers in large industries are simply required to have good skills. It is also important to note that small industries are not easily allowed to send their workers or owners to training courses for a long period of time.

The vocational training for the demobilized soldiers is a pressing need at present. Presently, it can be taken care by the SCVTA and VTCs only to a very limited extent.

C.2 Training Contents in a Rut

Apprenticeship training has been undertaken largely based on the training materials and lesson plans prepared by individual instructors. There has been no standard curriculum. Modification on the course-mix is made difficult by the lack of data on the labor demand.

C.3 Lack of Positive Thinking among Instructors

The instructors have not been encouraged to think and act positively toward changing circumstances. Instructors of VTCs are not generally better paid than those in the private vocational training schools. In addition, they are promoted, rewarded and qualified not always on a competitive basis. The aging of instructors is serious. It is partly due to a continuing limit on the recruitment of the government officials for many years. Rush of retirement of aged staff will cause discontinuities in the training contents, which have been maintained largely by individual efforts of instructors.

There are limited opportunities for them to exchange information and ideas on training, skills and other matters of their common interest. The instructors are not sufficiently provided with the allowance to cover the cost of fees and travel for their self-motivating participation in training. ITTS

has attracted a decreasing number of the instructors from VTCs due to the lack of SCVTA's fund to send them to ITTS.

C.4 Insufficient Maintenance of Tools and Equipment

Tools and equipment have not sufficiently maintained. As a result, about a half of the ongoing training courses are undertaken without skill practice. A number of equipment is outdated. But this is not the most important problem. What is more important is a deficiency in tools and materials for the trainees. A number of out-of-order equipment has long been left abandoned without repair. Trainees are not sufficiently provided with inexpensive but basic goods such as easy-to-read blackboard, classroom desks and triangle rulers. Some of the buildings are over-aged.

C.5 Uncertain and Inflexible Operation of the SCVTA and VTCs

SCVTA and VTCs have not been flexible nor aggressive do enough for it to more fully make use of its potential assets. First of all, management policies have not clearly been understood among the staff members. There is concern that the SCVTA and VTCs might lose their unity without such management policies.

Secondly, the SCVTA and VTCs exchange information and ideas with business people and state government officials, but mainly through limited informal channels. The Council is held for authorization only a few times in a year, though it comprises the members from both public and private sectors. Consequently, the SCVTA and VTCs used to prepare training materials without mobilizing external input.

Each VTC has not been in a position to think about what it is going to do. It needs permission from SCVTA even in many routine matters. There are insufficient exchange of information and ideas between VTCs and SCVTA as well as among VTCs, except at the directors' level.

Staff capacity of SCVTA is not enough especially to monitor labor market and training providers. It has not been able to effectively coordinate the activities such as training instructors, revising training contents, communicating with the private sector and monitoring the labor market.

In consequence, the SCVTA and VTCs have been able to do little but to operate themselves. They have hardly been able to afford to contribute to enhancing level of the vocational training nationwide.

C.6 External Constraints on the SCVTA and VTCs

The SCVTA and VTCs suffer not only internal but also external constraints. They are bound by the detailed ceiling of the Ministry of Finance and National Economy (MFNE) on recurrent expenditures and recruitment. Their operation cannot be with long-term perspective due to a monthly disbursement system imposed by MFNE. Since 2009, their own revenues from short-term courses have all been paid to MFNE in return of an increase in budget allocation. The government hardly accepts an increase in the amount of training fees, though it is about 20% as low as that of private VTCs. Consequently, VTCs enroll more trainees than original quota by 2 to 3 times, resulting in the declining level of training. This is a vicious cycle.

The SCVTA and VTCs have not been able to fully play their role under somewhat inconsistent vocational training policies. Irregular arrangements are sometimes enforced by political considerations. This is partly due to uncertain distinctions between training versus education and between skills versus technical training. Added to this are the limited administrative and financial capabilities of state governments to appropriately carry out human resource development. The inconsistency of vocational training policies may throw some doubts on the use of public vocational

training, in the light of a rapid growth of private vocational training.

By law, SCVTA is given sole responsibility for vocational training. In reality, however, a number of government agencies carry out de-facto vocational training. Ministry of Public Education has extensively developed secondary technical schools all over the country. However, they have not been very successful in sending their graduates to the labor market. The number of secondary technical schools is too large to sustain technical education.

Ministry of Higher Education launches a massive plan to set up technical colleges in many states with strong political and financial support. The students in technical college are secondary school graduates. They naturally have a larger capacity than the VTC trainees to absorb skills and techniques. Conceptually, technical college is distinct from VTC, but in reality, they overlap at least partly. Technical college is clearly more advantageous than VTC in supplying manpower to large modern factories.

On the other hand, private VTCs are raising themselves. It is under this situation that a clearer division of works needs to be made among different institutions for technical and vocational education and training.

D. Framework of Planning

In view of the potentials and issues as analyzed above, a framework of planning is proposed. It comprises: Objectives and strategies for a better vocational training system of Sudan, and A program to advance the reform of the SCVTA and VTCs.

D.1 Objectives

1. Maximizing employment and income opportunities for the young people.
2. Supplying skilled workers in response to national economic diversification.
3. Strengthening the competitiveness of small industries.

D.2 Strategies

1. Encouraging vocational training by non-governmental and private providers: Public initiative should be taken in the institutional arrangements and pilot activities for training those people whom

Non-governmental and private providers can hardly afford to take care, e.g. low income people, IDP and demilitarized soldiers.

2. Realizing a simpler division of works among TVET organizations (Table 1 below) in line with the dualistic and geographical nature of labor market: the SCVTA and VTCs should specialize themselves in fostering the skilled workers who particularly have the ability to adapt to changing working conditions.

Table 1 Division of Work in TVET (Source: JICA Study Team)

Type of Institution	Dualistic Labor Market		Major Location of Institution
	Large Industries	Small Industries	
Technical College	Technicians		Khartoum and States
VTC	Skilled Workers/Small Entrepreneurs		Khartoum and Major Regional Cities
Technical School		Artisans	States

3. Advancing the reform of the SCVTA and VTCs in the light of Strategies 1 and 2 above: In long and medium terms, SCVTA shall shift its emphasis from the direct operation of apprenticeship training to the monitoring and support of the training providers by private entities, NGOs and state governments. An issue at this juncture is how to deal with the existing VTCs that have suffered from the difficulty in operation and maintenance. The following alternatives are assumed for this issue:

Alternative 1: Strengthening the Current Set-Up

All the VTCs under SCVTA shall be maintained and improved under the current managerial set-up. In parallel, SCVTA shall strengthen the function to make vocational training policy, monitor training providers and support them. Thus, the SCVTA and VTCs shall recover as a major basis of

comprehensive apprenticeship training. This alternative calls for a full financial support of the Government to enable the SCVTA and VTCs to recruit instructors, replenish tools and replace out-of-order equipment. It also calls for financial assistance from time to time by many donors.

Alternative 2: Separating VTCs from SCVTA

All the VTCs under SCVTA shall be separated from SCVTA, and possibly restructured and recovered under the private or state initiative. SCVTA shall be specialized in making vocational training policy, monitoring training providers and supporting them.

This alternative is based on the assumption that training providers will grow fast in the private sector and under state governments, so that staff members of the VTCs will smoothly find jobs in growing training providers.

Alternative 3: Pursuing a Best Mix

Only a few VTCs shall be reinforced as a model of the vocational training of Sudan. Based on the practical experience of these VTCs, SCVTA shall strengthen the function to make vocational training policy, monitor training providers and support them. This alternative assumes a mix of the conditions for the Alternative 1 and the assumption for the Alternative 2. Alternative 3 is recommended, based on a comparative analysis of the effectiveness and reality of these alternatives. Figure 5 below shows the reorganizing of relations between SCVTA and VTC (Source: JICA Study Team).

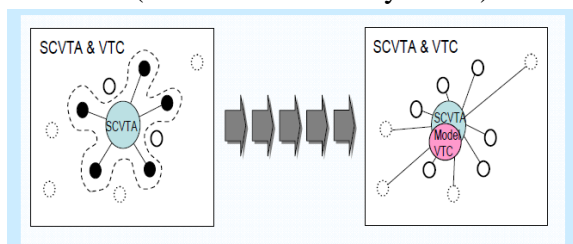


Figure 5 Reorganizing of Relations between SCVTA and VTC (Source: JICA Study Team)

D.3 Program to Advance the Reform of the SCVTA and VTCs

In order to carry out the strategies above, Strategy 3 in particular, a program is necessary to advance the reform of the SCVTA and VTCs. It comprises the following components:

1. Continuous and timely revision of training contents;
2. Strengthening of instructors;
3. Maintenance of tools and equipment;
4. Restructuring of SCVTA-VTCs; and
5. Expansion of the funds for recurrent expenditures.

In implementing the program, an attention should be paid to the following two distinct aspects of the program:

1. Recovering existing VTCs on priority basis;
2. Monitoring and supporting training providers; and

E. Action Plans.

In accordance with the program to advance the reform of the SCVTA and VTCs, a series of plans have been identified for the actions to be taken by 2013. Either of the following criteria has been applied to identify the action plans: Criteria 1: Being urgent to restore the managerial capacity to operate VTC of SCVTA under selection and concentration principle; and Criteria 2: Being significant as pilot activities to enable SCVTA to play a new role of facilitating diversification of vocational training through supervision and support of training providers. Table 2 below illustrates action plan, selection criteria and aims (Source: JICA Study Team).

Table 2 Action Plan, Selection Criteria and Aims (Source: JICA Study Team)

Action Plan to:	[Criteria 1] Being urgent to restore the managerial capacity to operate VTC of SCVTA under "selection and concentration principle".	[Criteria 2] Being significant as pilot activities to enable SCVTA to play a new role of facilitating diversification of vocational training through supervision and support of training providers.
Strengthen the Capacity to Develop Curriculum	<ul style="list-style-type: none"> - Reviewing the ad hoc revision of curriculum at present. - Establishing a sustainable set-up to revise curriculum. 	<ul style="list-style-type: none"> - Assisting the curriculum development by training providers. - Giving advice to providers on their organizational set-up and method for curriculum development.
Strengthen the System of Training Instructors	<ul style="list-style-type: none"> - Developing the capacity of VTC instructors to assist providers, by promoting, for them, follow-up training, the group training by themselves and in-site training. 	<ul style="list-style-type: none"> - Continuing the training of the newly appointed instructors of providers. - Starting a follow-up training for the in-service instructors, both within and outside VTCs. - Enhancing competence level of the instructors nation-wide.
Improve the System to Maintain Equipment and Facilities	<ul style="list-style-type: none"> - Recovering the maintenance of equipment and facilities which is in a crisis situation. 	
Improve Facilities	<ul style="list-style-type: none"> - Repairing the VTC facilities which are degraded but still recoverable. 	<ul style="list-style-type: none"> - Developing a facility to integrate model training, policy planning, research, curriculum development and other activities relevant to monitor and support providers. - Realizing efficient land use of VTCs.
Establish Training System for Small Industries		<ul style="list-style-type: none"> - Supporting self-reliant efforts of small industrial groups to strengthen their competitiveness.

F. Proposal for an Immediate Project

It is strongly recommended that an immediate project be launched with international assistance, if this study does not end up with a plan, but leads to action. Figure 6 below illustrates the restructuring of SCVTA and VTC (Source: JICA Study Team).

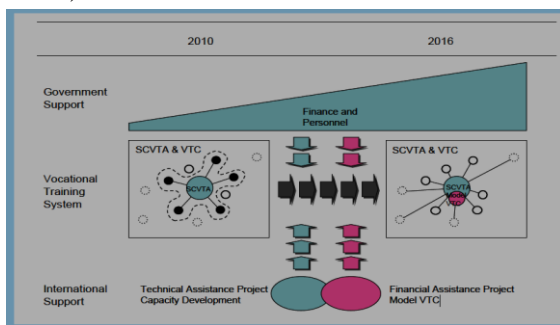


Figure 6 Restructuring SCVTA and VTC (Source: JICA Study Team)

As a first step, a project for developing the capacity of SCVTA is proposed in line with the action plans. The following is expected outcomes, major tasks and timing of the project:

Outcome 1: A more self-sustaining management of SCVTA and VTCs

Task 1 developing the capacity to revise curricula.

Task 2 strengthening the training of trainers and supervisors.

Task 3 improving the system to maintain tools, equipment and facilities.

Outcome 2: Stronger functions of SCVTA to support training providers through model training courses on the basis of public-private cooperation. In view of pressing need and rising momentum, the model courses are to be undertaken through:

Task 4 Training for demilitarized soldiers.

Task 5 Training for small enterprises.

Timing: June 2010 through June 2013.

G. Important Given Conditions for a Better Vocational Training System

1. Intensive basic education as a basis of effective vocational training.

2. Stable recurrent budget for vocational training.

3. Stronger capabilities of state governments to manage vocational training and better understanding of state governors on vocational training.

4. Continuous international cooperation and information sharing among donors.

H. Pilot Activities

As shown in Table 3 below, workshops have been undertaken as a pilot activity to examine significance and feasibility of the action plans.

II. HISTORICAL BACKGROUND OF TECHNICAL EDUCATION IN SUDAN

Sudan pre-independence public education system was designed by the colonial power to produce civil servants and professionals. Post-independence, the system underwent many changes, aimed at meeting the country dynamic economic and social needs. Up to the advent of national salvation government, the education in Sudan is free and compulsory for children aged from six to 13. Primary education lasts six years, followed by three years of intermediate school and finally another three years of secondary school. Students can choose between two academic tracks

scientific and literary option and/or technical track (agricultural, industrial, and commercial).

The language of education at all levels is Arabic. Schools are concentrated in urban residential areas. During the rule of salvation government there was a major change in education system which resulted in increasing primary education two years, cancelling the intermediate level and leaving secondary level as it is. Primary school enrollment in 2001 was estimated by the World Bank at 46% of eligible students and 21% of eligible secondary school students. Enrollment varies widely, falling below 20% in some provinces.

Besides public education, Egyptian educational missions and missionary schools have contributed a great deal to education in Sudan, with activities extending to a number of provinces.

Private education at primary and secondary levels was introduced in the 1950s, and spread quickly after the deterioration in public education. Although there are no exact figures, there are known to be several expensive and prestigious private schools in Khartoum, accommodating pupils from upper class families and teaching in English.

Higher education emerged in 1902 with the establishment of Gordon Memorial College. It changed its name to the Khartoum University College and broke away from the University of London in 1956, becoming the University of Khartoum.

Before independence, several educational institutions were established to award diplomas to government employees who had completed secondary school. One of these was the Khartoum Technical Institute, the leading center of technical education in Sudan. It became the Khartoum Polytechnic Institute in 1975 and was given university status in 1990, becoming the Sudan University of Science and Technology.

Cairo University (Khartoum Branch) was established in 1955 and renamed Al-Neelain University in 1993. In 1975, the universities of Juba and Gezira were established.

After the revolution of higher education of 1990, the number of government universities jumped from five to 35 in 2010. At the same time, higher education became a field of private investments and tens of private universities and colleges were opened in all parts of the country, with a noticeable concentration in Khartoum. The number of private universities and colleges is now estimated to be around 80. This tremendous upsurge resulted in a shocking drop in government expenditure on public education, accounting for only 1% in 2010 and 2% in 2011.

The rapid expansion of higher education institutions was accompanied by a marked deterioration in the quality of the education provided, and some 45% of graduates are unemployed.

Technical education is distinguished from other types of education because of its direct link to the needs of the labor market, it promotes the economic and social life, and it follows up the new technical modifications. Figure 7 below shows the international pyramid for the proportionality of labor force. The qualifying of the Technician needs several capabilities such as: Establishing laboratories and specialized workshops; Preparation and qualifying of instructors and trainers; and Review of the curricula in accordance with the needs of the labor market and development. Figures 7 and 8 below respectively illustrate diagrammatically the ideal international pyramid for the proportionality of labor force and the technical education tracks as shown in Figure 8 below.

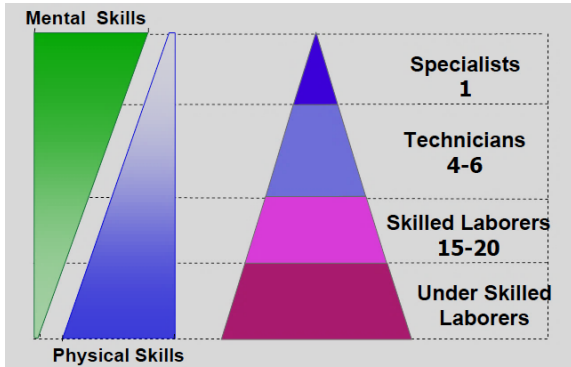


Figure 7 International pyramid for the proportionality of labor force

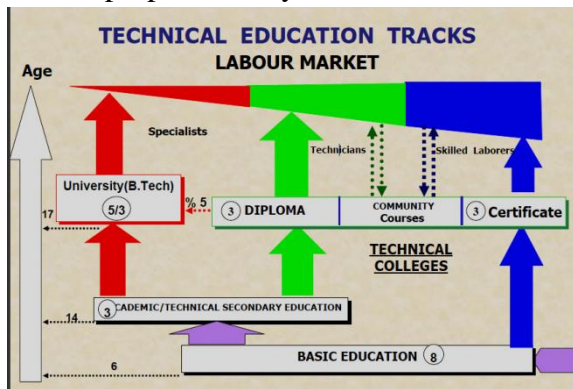


Figure 8 Technical education tracks

In 1902, Gordon Memorial college (GMC) established a vocational and technical education for secondary school (four years of study: two academic and two vocational). In 1939, Post-secondary technical education was introduced.

In 1951, Khartoum Technical Institute (KTI) was established and annexed to it all the training units in the different governmental departments. The period of study is three years after the completion of secondary school.

In 1962, the period of study in the Khartoum Technical Institute (KTI) for the diploma was increased from three years to four years.

In 1971, The (KTI) was divided and distributed to a number technical colleges in the different regions in the Sudan.

In 1975, The (KTI) was transformed into the Institute of Technical Colleges (ITC).

In 1983, The (ITC) started studies of Bachelor degree of Technology (B. Tech) + the diploma degree.

In 1990, The (ITC) was transformed to the Sudan University of Science and Technology (SUST).

III. CURRENT SITUATION OF TECHNICAL EDUCATION

The following bar chart (Figure 3) shows the distribution of diploma students for Higher Education institutions for the academic years 2001/2002 up to 2004/2005 [26].

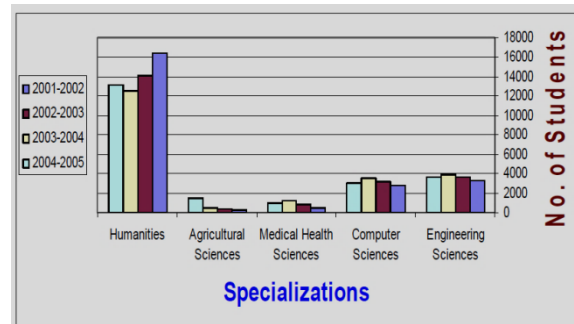


Figure 3 Distribution of Diploma Students for Higher Education Institutions for the Academic Years 2001/2002 up to 2004/2005

A. The National Project of Establishing Ideal Technical Colleges

(a) College Objectives:

1. Providing scientifically and practically qualified technicians able to work in the changing modern technology.
2. Giving due consideration to scarce technical specializations.
3. Giving due consideration to applied scientific research required to the country's development plans.
4. The selected specialization of these colleges must satisfy the local needs of the community around the college premises.

(b) College Tributaries:

1. Technical secondary schools (industrial, agricultural, commercial and woman studies).
2. Academic secondary schools.

3. Successful students in the qualifying course for students of vocational training centers and apprenticeship institutes.

(c) Characteristic Features of the College:

1. Study system: credit hours system.
2. Type of study: Diploma level.
3. Number of Departments: 3-5 departments.
4. Number of semesters: 4-6 semesters.
5. Study hours in class: 15-20 credit hours.
6. Total credit hours for each Programme: 70 –110 hours.
7. Total contact hours (Practical training included): 1500 -2500 hours.

(d) Preparations:

1. Laboratories.
2. Workshops.
3. Halls and theatres.
4. Offices.
5. Computer laboratories.
6. Equipment and devices.
7. Library.
8. Public utilities, gardens and passages.

(e) Fields of Technical Engineering College:

i. Civil Engineering

Construction, Irrigation and drilling, Sewage system, Roads and bridges, Buildings and quantitative methods, Surveying, Environmental Engineering, Hydraulic Engineering.

ii. Electrical Engineering

Internal Electrical Connections, Electrical Networks, Electronic devices, Computer maintenance, Computer Network, Medical equipment and instruments, Communication, Electrical Equipment and Devices.

iii. Mechanical Engineering

Automobile, Thermal power, Jet engineering, Agricultural Machine, Heavy Machines, Air conditioning and Refrigeration, Welding and Forgery, Metallurgy, and Foundry.

iv. Petroleum and Mining Engineering

Drilling, Petroleum refining, Mining, Petroleum transport.

v. Textile Engineering

Trico, Dyeing and Printing, Textile Spinning and Weaving.

vi. Chemical Engineering

Food processing, Pharmaceutical manufacturing, Leather, Plastics, Oil manufacturing and Sugar technology.

When designing the Programme of this college, the following points should be noted:

1. The Programmes are unique and not a print copy of other ones.
2. Special considerations to be given for rare but important specializations.
3. The Programmes must obey the local community needs.
4. The Programmes must fulfill the country development needs.

B. The Technical Colleges

The Number of Technical Colleges Now Is 17: They are distributed uniformly in the different regions and states of Sudan.

Nyala Technical College – Southern Darfur State

Elshiekh Elbadri Technical College – Nile Valley State

Elmehairiba Technical College – Gaziera State

Kenana Technical College – White Nile state

Kassala Technical College – Kassala State

Elgeteina Technical College – White Nile state

Wad Medani Technical College – Gaziera State

Elgereif Sharg Technical College – Khartoum State

Port Sudan Technical College – Red Sea State

Merowe Technical College – Northern state

Gedaref Technical College – Gedaref State

Elfieig Technical College – Gaziera State

Rabak Technical College – White Nile State

Om Rowaba Technical College – North Kordofan State

Damazin Technical College – Blue Nile State

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Fadasi Technical College – Gaziera state

Faris Technical College – Gaziera State

C. Challenges Facing Technical Education

1. Improving the ratio of Diploma to B.Sc. graduates.
2. Finance: government, foreign donations, private sector, trainee fees.
3. Capacity building of teachers and trainers.
4. Job description specification for each specialization.
5. Development of curricula to suit the labor market.
6. Quality of Technical Education.
7. Flexibility in admission.
8. Diversification of programs.

IV. CONCLUSIONS

In summary, the plan that was set by Vocational Training and Apprenticeship (SCVTA) and Vocational Training Centers (VTCs) and other participants revealed several important issues related to technical education in Sudan. The participants acknowledged the mixed historical experiences and stigma associated with technical education. Yet while they were aware of the difficult challenges and obstacles facing Sudan, including political ambiguity over the upcoming democratic elections and capacity challenges, many of the participants in this study were also optimistic and hopeful for positive change. There are considerable opportunities for developing a diverse array of marketable and apprenticeable trades specific to Sudan which can contribute to sustainable development and post democratic transformation reconstruction. There is no doubt that technical education is crucial if local people are to participate in nation-building and benefit from expanding market activity in Sudan.

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