

5. Current State of Employment, Government Skill Development Policies, and Key Challenges

5.1 Employment Scenario

In depth understanding of the employment situation and the skill development in Pakistan requires that it should be reviewed in relation to the present formal education system and particularly with reference to those who fall out of the formal education system and may be absorbed in the technical and vocational education process for improving the employment scenario in Pakistan.

The estimated adult literacy rate in Pakistan is approximately 50%. In 2005, the total number of dropouts at all school levels, from primary to higher secondary (1st grade to 12th grade), is estimated to be 17 million accounting for 61% of the total enrollment of 28 million. At the primary school level, priority is placed on general education.

At the same time, it is well recognized that human resource development in the form of school education is an effective way to reduce unemployment. In the country, the current unemployment rate is estimated at about 7%, but if underemployment is included, the figure will be considerably higher. Especially, women's participation in economic activities is very limited. To improve the current situation, the government envisages a developed, industrialized, just and prosperous Pakistan through rapid and sustainable development. It means diversification from a narrow based economy to a broad based economy. The Government's long term vision is to produce 1 million skilled workers by 2010. It is, therefore, imperative to incorporate and integrate diversified technical education and vocational training at various levels of the formal education system.

Table: Educational Levels (10 Years and Over)

Educational levels		Share (%)	Completed grade
Literate		52.4	
Formal education		52.2	
	Degree & post grad, Ph. D	3.6	Degree
	Inter but below degree	4.4	Grade 12

	Matriculation but below inter	9.8	Grade 10
	Middle but below matriculation	10.6	Grade 8
	Primary but below middle	16.8	Grade 5
	K. G. but below primary	7.1	
	Nursery but below K. G.	0.1	
	No formal education	0.2	
Illiterate		47.6	

(Source: Labour Force Survey 2005)

Table: Unemployment rate and breakdown by sex (10 years and over)

	Percentage rate: %			Unit: million		
	Total	Male	Female	Total	Male	Female
Total	6.81	5.90	10.26	3.40	2.34	1.06
Rural	5.88	4.99	8.62	2.02	1.30	0.72
Urban	8.85	7.64	17.38	1.38	1.04	0.34

Note: Underemployment is included in employment.

(Source: Labour Force Survey 2005)

Evidently, the agriculture sector still provides the largest job opportunities. The Labour Force Survey 2005, presented below, reflects that share of mid level occupation groups between management and unskilled workers are fairly small.

Table: Employment by Major Industrial Groups

Major industrial groups	Share (survey results) (unit: %)	No. of employees (estimation) (unit: million)
Total	100.0	44.4
Agriculture, forestry, hunting & fishing	44.0	19.6
Mining & quarrying	0.1	0.0
Manufacturing	14.1	6.3
Electricity, gas & water	0.8	0.4
Construction	6.1	2.7
Wholesale & retail trade & restaurants & hotels	14.0	6.2
Transport, storage & communication	5.7	2.5
Financing, insurance, real estate & business services	1.2	0.5
Community, social & personal services	13.9	6.2
Activities not adequately defined	0.1	0.0

(Source: Labour Force Survey 2005)

Table: Employment by Major Occupational Groups

Major occupational divisions	Share (survey results) (unit: %)	No. of employees (estimation) (unit: million)
Total	100.0	44.4
Legislators, senior officials & managers	11.5	5.1
Professionals	1.8	0.8
Technicians & associate professionals	5.1	2.3
Clerks	1.5	0.7
Service workers & shop & market sales workers	4.9	2.2
Skilled agricultural & fishery workers	36.5	16.2

Craft & related trades workers	16.0	7.1
Plant & machine operators & assemblers	4.2	1.9
Elementary (unskilled) occupations	18.5	8.2

(Source: Labour Force Survey 2005)

5.2 Changes in the Number of Employees

The total number of employees in all industries increased from approximately 36 million in 1998, to 42 million in 2003-04, and an estimated 44 million in 2005-06. Comparison of employment data by industrial and occupational group in 1998 and 2003-04, breakdown data is available for these years only, reveals that two sectors achieved highest growth rates, namely the manufacturing sector by 7.8% (from 5.9% to 13.7%) and the wholesale, retail trade, restaurants and hotels by 5.7% (from 9.1% to 14.8%).

In the manufacturing sector, 3.6 million employees were added, and a large number of them were workers engaged in manual labour. In the wholesale and retail trade sector, managers increased as much as 4 million, while service and sales workers decreased by 1.7 million, and the sector's total employees increased approximately by 2.9 million. During the same period, the elementary (unskilled) occupations in the construction sector decreased drastically and, mainly because of this tendency, the number of unskilled workers decreased while managers and workers engaged in manual labour increased. In between the two occupational levels, the fact that the professional workers decreased is considered to be a major issue.

The share of workers in the agricultural sector increased by 4.8% from 38.3% to 43.1%. The absolute figure was 4.1 million and larger than any other sectors.

Table: Estimated Number of Employees by Industrial and Occupational Group in 1999(unit: thousand)

	Total	Agriculture, forestry, hunting & fishing	Mining & quarrying	Manufacturing	Electricity, gas & water	Construction	Wholesale & retail trade & restaurants & hotels	Transport, storage & communication	Financing, insurance, real estate & business services	Community, social & personal services	Activities not adequately defined
Total	36,072	13,941	73	2,148	182	7,389	3,312	1,201	437	5,751	1,638
Legislators, senior officials & managers	109	36	0	0	0	0	0	0	0	73	0
Professionals	1,711	36	0	36	0	0	109	0	328	1,128	73
Technicians & associate professionals	1,066	0	0	218	0	0	36	36	36	692	36
Clerks	692	36	0	36	36	0	0	36	36	437	73
Service workers & shop & market sales workers	3,713	109	0	73	0	36	2,803	36	0	473	182
Skilled agricultural & fishery workers	12,594	12,194	0	0	109	36	36	0	0	109	109
Craft & related trades workers	1,711	36	36	874	0	218	73	36	0	400	36
Plant & machine operators & assemblers	1,165	36	0	146	0	36	0	837	0	73	36
Elementary occupations	12,340	1,456	36	764	36	7,062	255	218	36	1,456	1,019
Workers not classified by occupation	983	0	0	0	0	0	0	0	0	910	73

(Source: Population and Housing Census 1998)

Table: Estimated Number of Employees by Industrial and Occupational Group in 2003/04(unit: thousand), Labour Force Survey 2003-04

	Total	Agriculture, forestry, hunting & fishing	Mining & quarrying	Manufacturing	Electricity, gas & water	Construction	Wholesale & retail trade & restaurants & hotels	Transport, storage & communication	Financing, insurance, real estate & business services	Community, social & personal services	Activities not adequately defined
Total	41,813	17,999	29	5,739	284	2,433	6,191	2,395	439	6,278	25
Legislators, senior officials & managers	4,803	4	4	192	33	67	3,992	130	138	238	4
Professionals	829	0	0	100	21	8	4	25	25	640	4
Technicians & associate professionals	2,048	17	4	88	17	13	71	79	188	1,568	4
Clerks	681	0	0	105	50	8	21	92	50	351	4
Service workers & shop & market sales workers	2,153	0	0	79	8	4	1,120	213	13	715	0
Skilled agricultural & fishery workers	14,601	14,530	0	0	13	0	4	0	0	54	0
Craft & related trades workers	6,638	0	13	4,255	79	656	88	75	4	1,467	0
Plant & machine operators & assemblers	1,560	130	0	226	29	25	0	1,053	4	92	0
Elementary (unskilled) occupations	8,502	3,319	8	694	33	1,651	990	727	17	1,154	8
Workers not classified by occupation	0	0	0	0	0	0	0	0	0	0	0

Table: Estimated Changes in Number of Employees by Industrial and Occupational Group during 1999 - 2003/04 (unit: thousand)

	Total	Agriculture, forestry, hunting & fishing	Mining & quarrying	Manufacturing	Electricity, gas & water	Construction	Wholesale & retail trade & restaurants & hotels	Transport, storage & communication	Financing, insurance, real estate & business services	Community, social & personal services	Activities not adequately defined
Total	5,741	4,058	-44	3,592	102	-4,956	2,878	1,194	2	527	-1,613
Legislators, senior officials & managers	4,684	-32	4	192	33	67	3,992	130	138	165	4
Professionals	-983	-36	0	64	21	8	-105	25	-303	-489	-69
Technicians & associate professionals	993	17	4	-131	17	13	35	43	152	876	-32
Clerks	-10	-36	0	68	14	8	21	56	14	-86	-69
Service workers & shop & market sales workers	-1,560	-109	0	7	8	-32	-1,683	177	13	242	-182
Skilled agricultural & fishery workers	2,006	2,336	0	0	-97	-36	-32	0	0	-55	-109
Craft & related trades workers	4,927	-36	-24	3,382	79	438	15	39	4	1,067	-36
Plant & machine operators & assemblers	395	94	0	80	29	-11	0	216	4	19	-36
Elementary (unskilled) occupations	-3,837	1,663	-28	-71	-3	-5,411	636	509	-20	-302	-1,011
Workers not classified by occupation	-983	0	0	0	0	0	0	0	0	-910	-73

(Source: Population and Housing Census 1998 and Labour Force Survey 2003-04)

5.3 Informal Sector

According to the Labour Force Survey undertaken in 2003-04, 70% of non-agricultural employees worked in the informal sector, which mainly consisted of family enterprises having less than 10 employees without having formal business registration. In the wholesale and retail sector as well as the construction group, the informal sector accounts for over 90%. In terms of the number of employees, it is estimated that there are approximately 5.8 million informal workers in the wholesale and retail sector, 3.4 million in the manufacturing sector, and 3.1 million in the community, social and personal services sector. The informal sector plays positive role in terms of job creation. On the other hand, shift to formal businesses is a major challenge for the industrial enterprises and they will increasingly require systematic operations in the future.

Table: Estimated Number of Employees in the Informal Sector in 2003/04

(unit: thousand)

unit thousand	Total	Agriculture, forestry, hunting & fishing	Mining & quarrying	Manufacturing	Electricity, gas & water	Construction	Wholesale & retail trade & restaurants & hotels	Transport, storage & communication	Financing, insurance, real estate & business services	Community, social & personal services	Activities not adequately defined
Total	41,900	17,994	29	5,737	284	2,432	6,189	2,394	439	6,276	25
Informal	16,664	17,994	7	3,435	12	2,230	5,770	1,958	233	3,120	0
Formal	7,142		23	2,303	272	202	419	536	205	3,157	25

(Source: Labour Force Survey 2003-04)

5.4 Employment Policy

The employment policy stated in the Medium Term Development Framework is summarized as follows.

Employment cannot be generated by the labour market-oriented policy alone and an effective approach from the demand side is essential. Then as an employment intensive economic growth strategy for job creation, MTFDF specifies the following strategic sectors: agriculture and livestock; manufacturing industries, especially small- and medium-scale manufacturers; telecommunications and information technology services; housing and construction; and natural resources.

For effective job creation, it is imperative to attract new investment, implement effective and timely development projects, streamline public services, create an environment to allow healthy growth of SMEs, provide incentives for the private sector to pursue skill development efforts, and restructure technical education and vocational training systems to meet the actual needs of industry.

The employment strategy is a combination of establishing flexible employment relationships to meet the high turnover; ensuring economic and social security of employees, and active mobilization of the labour market through skill development of the unemployed. In addition to the creation of employment opportunities it is also

equally important to ensure that there is fair distribution of income among the working class.

5.5 Skill Development Policy

Regarding skills development and vocational training, MTDF states that the existing technical and vocational training system is insufficient and inadequate to meet the requirements of the fast growing industrial sector, hence, identifies following key areas for skill development and vocational training.

- Need oriented, multi skill and flexible training to meet the changing needs of local industry, overseas employment and self-employment
- Setting minimum standards for training, examination and certification
- Operational and financial autonomy of training institutes
- Enhancement of public-private partnerships

MTDF also proposes following actions to be undertaken.

- To establish Technical Education and Vocational Training Authorities at the national and provincial levels
- To establish new facilities throughout the country
- To introduce “Skills and Technology” as a compulsory subject in education for eight grade to 10th grade -

MTDF also envisages providing training to one million youth with a view to achieve significant increase in productivity and efficiency primarily through the involvement of the private sector. The government has also announced incentives for the private sector for establishing vocational, technical or polytechnic institutes in the country.

The Ministry of Labour, Manpower and Overseas Pakistanis, places high priority to following sectors: construction; heavy duty machinery and equipment; service (hotel, tourist services and office management skills); agriculture; high-technology (engineering and electronics); and textile.

5.6 Key Challenges

The majority of the population has not completed basic education. Illiterate individuals and those whose educational background is below the fifth grade are 55% of the

population group of 10 years or older. Clearly it is a major constraint having adverse impact on the promotion of technical education and vocational training.

There seem to be a considerable number of underemployed persons and those who are potentially capable of working but virtually unemployed such as women who do not pursue employment because of the lack of opportunities. Evidently, the scope of vocational training for women is tremendous and has potential for wider application.

According to the Labour and Manpower Division's report on the number of Pakistanis who worked overseas in March 2003, top shares are accounted by unskilled workers (31.0%), drivers (13.1%), masons (7.7%), technicians (6.0%), and carpenters (5.7%). Clearly, the current pattern characterized by the high share of unskilled workers should be changed by increasing the percentage of contributions by the skilled workers. MTDF also specifies that the following professionals may continue to stay in demand in the international labour market.

engineers	plumbers
nurses	steel fixers
welders	technicians
masons	mechanics
carpenters	drivers
electricians	different types of operators
cooks	information technology and computer science

6. Labour Market Information System

The labour force survey, which is conducted every 1.3 years on average since 1963, has been providing useful statistical data. However, it does not provide supply and demand information of the labour market.

In addition to the supply and demand surveys, there have been several training needs surveys, although some of them have narrowly targeted limited types of industries and areas. According to the Ministry of Labour, Manpower and Overseas Pakistanis, the most recent training needs survey was conducted in 1995. In 2003, the Asian Development Bank published a report entitled Labour Market Survey of Pakistan, and currently the World Bank is conducting a labour market study. In addition, SMEDA has conducted its own training needs assessment.

In 2004, Skill Development Councils, both Islamabad and Karachi, conducted training needs surveys in their respective areas. In the light of an insufficient alignment between the labour market and activities of skill training institutes, the Ministry of Labour recognizes the need to carry out surveys so as to gauge the prevailing supply and demand situation, desirably including rural areas.

An issue to be addressed in the near future is to put in place a labour market information system. It may contain information on job opportunities and job seekers as well as labour market trends and initiatives. In addition to the broad coverage of information, it is necessary to study what type of organization should build and operate the system for its proper functioning. There already exist a number of overseas employment agencies, but no information is available on domestic employment agencies, although it is said that there was a system called "National Development Volunteer Programme" for all graduates to register in the 1970s.

7. Human Resource Development in Industries and Emerging Challenges

7.1 Recruitment of Workers

In general, companies in Pakistan recruit their employees when demand arises and do not make regular hiring. Large companies sometimes announce vacancy information on newspapers, especially for recruitment of middle or high-level personnel. But smaller enterprises and even large companies often recruit new employees through personal contact.

Generally, small enterprises are reluctant to hire and train inexperienced people, as they consider such trainings unnecessary causing deep impact on the cost. On the other hand, large companies hire new graduates, typically as apprentices for several months or a couple of years. Some large companies require matriculation as a minimum requirement for hiring skilled and semi-skilled workers.

The turnover rate of employees varies among industries and types of companies. In the cases of the major automobile manufacturers, it is as low as 5% per year, whereas it is higher for textile and other industries.

For example, an automotive component supplier with 750 employees recruit through newspaper advertisement and/or word of mouth as demand arises. For executives and engineers, experienced people are recruited and new graduates may start as apprentices. As for general workers, new graduates are hired as apprentices for three years. The company's management believes that new graduates are relatively more enthusiastic and motivated and respond positively to learning inputs.

In the textile industry, there is no organized system to recruit employees. As educational qualification, the bachelor of engineering in textile is regarded to be most appropriate. The bachelor of engineering, diploma, and diploma of associate engineer are also welcomed. Recruitment is usually made by word of mouth. For example, graduates of National College of Textile contact company owners through personal contacts. Firms do not publicly recruit new graduates because recruiting through personal connections is generally thought to be less risky. At present, there is a shortage of manpower including that of unskilled workers. Therefore, the number of job opportunities advertised through news papers is increasing, which is a relatively new trend.

Overall, considering the limited demand for new employees within the existing industries the self-employment is also being considered as another viable option.

7.2 Training of Workers

The cost of training at a vocational training institute is generally borne by the employee and not by the employer. However, sometimes, employers do send their employees on a short course. In such instances training institutes charge no tuition fee but trainees have to pay a small fee. But in such instances the employer is not certain about the return of the employee to the same company.

On-the-job (OJT) training has emerged, as the most common practice of training of employees by employing companies. Generally employers are reluctant to spend money on specialized training of their employees. The relatively high turnover of the employees is one of the several key reasons. It is for the same reason that the training at small enterprises is largely limited to OJT.

In the textile industry, for example, OJT is the basic form of employee training. Also, companies may send their employees to other companies for the purpose of learning operations of specific production equipment. However, this is limited to companies whose managers have acquaintances in other companies.

A typical spinning company employs 600-700 people, out of which usually 100-150 are technical personnel and managers and the rest are semi-skilled workers, whose position can be filled by people without minimum education, even by those who are not literate.. In other words, a large number of vacancies are filled by employing even those who are not literate at all. Such types of workers are expected to perform their work sufficiently after having received several days of in-house training. On the other hand, in the garment and knitting industries, most workers need to have high skills and require systematic training. In fact, most workers are considered to be skilled workers.

On the other hand, the major automobile manufacturers may be regarded as exceptional in this regard because they have a systematic training system under the supervision of a designated department having budget allocations intended to be used for equipping their own employees, dealers, and suppliers with the required technical and managerial capabilities. In addition to this a manufacturer also has an evening programme for

heavy-duty motor vehicle technicians. This course is open to the general public and accredited with the Provincial Board of Technical Education.

It is generally said that new employees having academic degree of matriculation require at least 2 years of training before they can work on their own. The types of trainings available can be classified as follows:

- Technical training
- Overseas technical training
- Training at an outside training institutes
- OJT
- Apprenticeship Training Programme (for example, 3 years after the matriculation)

Suppliers of automakers, on the other hand, receive technical assistance, equipment, and customer's audit on product quality. For example, a big supplier is training its employees mainly relying on OJT and sometimes sends them to other training institutes. Typical subjects learned at training institutes are orientated towards management. Overseas training under a technical assistance arrangement with a Japanese company is also carried out. Another best practice among the leading automobile manufactures to their subcontractors is that they visit their suppliers for field assistance ensuring compliance to product quality standards, delivery schedule and required documentation.

7.3 Apprenticeship

Various types of apprenticeships are offered by a number of companies. Periodical monitoring and evaluation of the system and its results can be useful in order to make it more beneficial for both the trainee and the employer.

7.4 Supply and Demand Gap in the Labour Market

During the field survey, a gap between manpower supply and demand was pointed out as a major issue to be addressed. In general, the existing technical education and vocational training institutes are unfavorably evaluated by industrial circles. In fact, some institutes previously received good reputation but are said to be on the decline in terms of educational quality.

Problems commonly raised during the study in terms of the existing training institutes can be summarized as follows.

- Machinery and equipment used for training is obsolete.
- Teachers/instructors do not have high levels of teaching ability; insufficient motivation and low salary packages of the teachers have further adverse effect on the teaching quality
- The curriculums and courses do not correspond to the changing and growing needs of the industrial sector
- The management lacks capability and authority.
- Graduates do not have sufficient knowledge and skills.

On the other hand, there are some better-reputed institutes. For example, Pak Swiss Training Centre is known for producing highly skilled graduates in die and mold technology. The Skill Development Councils is said to be offering a variety of courses that are flexible and do correspond largely to the market needs, although their institutional capacity is relatively small.

The study also takes into account following opinions presented by industry at large during the mission:

The actual need is to have middle level skilled workers, rather than to go for top management level personnel. Many graduates from technical education and vocational training institutes lack basic knowledge and skills. In other words, they have not learned proper ways of thinking as engineers/technicians. If they have fundamental knowledge and skills, they will be able to develop themselves by further learning in the field. On the other hand, if they cannot draft drawings, they cannot understand them accurately.

The institutes are not keeping abreast with the changing technologies. For example, changes from mechanical systems to electronic systems necessitate reorganization of training facilities. Another example is aluminum welding that is not known by most training institutes and their instructors.

In addition to technical knowledge, the fields of marketing and management are becoming important for graduates in order to have broader viewpoints when they work in the field.

8. Private Sector's Participation in Technical Education and Vocational Training, and Key Challenges

8.1 Participation of Private Sector in Technical Education and Vocational Training

Generally, government-controlled technical education and vocational training institutes are rated low in terms of capacities of instructors, quality of machinery and equipment, disciplines, and linkage with industries, with the exception of a few excellent institutes such as Pak Swiss Training Centre which is under the Pakistan Council of Scientific and Industrial Research (PCSIR) reputed for autonomous management.

Technical education and vocational training are also conducted by the private sector, which means either by private schools or a company. Such private institutes as well as those operating under the public-private partnership are reputed for imparting relatively higher quality of education but their number is limited. Meanwhile to strengthen linkage with industries, Institute Management Committees and Centre Management Committees have been set up at a number of training institutes, under participation of representatives from industrial circles and individual companies, but they are also viewed as exceptional cases.

The Skill Development Council is a tripartite council established under the Ministry of Labour, Manpower and Overseas Pakistanis. It consists of ten members, five are from the public sector, four represent private sector and one member is from a labour union. The council is conducting various training courses in response to the needs that have been identified through surveys and by utilizing external human resources and facilities including those of other training institutes and industries.

Following are some examples of contribution of industries orientated towards training and education.

Indus Motor Company supports two secondary schools in Lahore and Karachi. It provides teaching materials and teachers. The teachers are recruited outside the company and they first study teaching materials. The course is a three-year diploma course mainly for vehicle maintenance and repair (not mainly for manufacturing) at a higher secondary level and graduates receive Diploma of Associate Engineer in Automobiles.

A number of training institutes receive donations from trade associations in related industries. Although they face similar problems relating to quality and availability of instructors and equipment as seen in many other institutes, the industries have continued to support their own industries.

The Workers Welfare Fund collects 2% of the income of each company for workers and their families including their training. For example, the Skill Development Council (SDC) is already receiving the grant from the fund for skill training.

The Export Promotion Bureau established the Export Development Fund. 0.25% of the value of exports should be contributed to the fund under Ministry of Commerce for the purpose of export promotion including training. For example, the fund is used for training by trade associations. The training is monitored by the Export Promotion Bureau. For proper management of such funds, transparency and accountability need to be maintained.

Now, one effective way to revitalize existing technical education and vocational training institutes is to put them under private management, primarily management by a private school or an organization participated by private companies. In such cases, a key successful factor as learned from past experience is to select right persons for key positions such as management committee members and principals.

It should be noted, however, that the highly reputed Pak Swiss Training Centre is not under private management. Its good performance seems to be attributable to the following factors.

Clear management hierarchy (chain of command) and autonomous power of the Pakistan Council of Scientific and Industrial Research (PCSIR), under which PSTC is positioned.

The governing body of PCSIR has full power and comprises only four full-time experts. High capability and strong driving will of the director.

The approach to focus on basic and practical training complemented by new technologies.

8.2 Case Studies

The following examples suggest the ways in which two highly reputed large corporations deal with the key issues of human resource development, education and training, and other activities relating to industrial development.

8.2.1 Case study of a pharmaceutical company

A Quetta based pharmaceutical company is owned 25% by local capital and 75% by German. It has approximately 600 employees, 80% of whom are illiterate. The workforce includes ten skilled machine operators and some engineers in pharmacology.

The company has no linkage with other local factories. Actually there is no other pharmaceutical factory in that area. Raw materials used for production are purchased from Karachi or Lahore and the products are transported to these two cities.

Technical training institutes generally do not meet the company's needs. The company hires university graduates as apprentices who spend six weeks with salaries equal to those of the employees. Then they can continue working as long as they want as management trainees. They may get jobs at other companies, or when the company has a vacant post, they can apply for it.

Reasons for the company's success, according to the management, are: proper operation and management; continuous technological upgrading; and commitment to the local area.

8.2.2 Case study of an electric company

This electric appliance and power equipment manufacturing company employs over 10,000 people across the country. Around 8,000 employees work at the headquarters and factory situated in Lahore, out of which 7,000 are primarily engaged in production activities. The workforce consists of 10 - 15 % engineers, 20% sub-engineers (typically DAE holders), 50 - 60% skilled workers (various certificate holders), and 10 - 15% unskilled workers (packing, lift operation, etc). Most of the production workers have received education and/or training in electrical, mechanical and/or plastics.

The company maintains a "management trainees and trainee engineers" system for fresh graduates that lasts up to 9 months. Annually 25 - 30 people join the company under the system and many of them are employed after the completion of the training..

Other employees are recruited on “as-required basis” by adopting any and/or combination of following processes:

- Hiring through the existing employees’ networks such as personal connections with technical colleges and polytechnics
- Offering “Apprenticeship programme” as an incentive to middle/lower level workers , which means advertisement is done through the national newspapers and the duration of the programme is usually two years and the trainees are provided apprenticeship with minimum wage and the possibility of having recruited at the completion of the training programme.
- Direct hiring of experienced people through newspaper advertisement followed by short listing of candidates and appointment is done after having interviewed the candidates
- Appointing fresh graduates from the university campus (BSC or BE is minimum requirement)

According to the company’s training and development officer, in general, engineers graduating from colleges usually have theoretical knowledge but lack practical skills. On the other hand, graduates of training institutes often lack basic knowledge because the institutes do not have adequate resources including teachers and equipment.

The company has both on-the-job and off-the job training. The former has already been explained in the previous text, whereas the latter consists of the following.

- Sending workers to various training institutes on training &/or study visits
- Inviting experts from various training institutes to impart training
- Sending workers on non-technical courses (management, personnel development, communication skills, etc)

The company purchases parts from many suppliers all over the country. Some of them are under long-term contract and others are contracted on an occasional basis. The company strictly evaluates the quality of the vendors’ products and sometimes their processes also. If necessary, it helps the vendors to improve the quality of their products.

8.3 Challenges

The above quoted cases of individual companies' contribution to technical education and vocational training have been taken from few exceptions that exist within the manufacturing sector. If these success models to be replicated and applied to other industries, as it was proposed during the study, then we first need to have answers to the following: what measures should be taken by individual companies to meet the growing need for human resource development; and how the costs should be shared by the company, the employee and the public sector. They should be worked out keeping in view the factors responsible for the employees turn over and the pattern that it follows over a period of several years by the cost sharing partners.

9. Integration of Industrial and Employment Promotion Policies and Technical Education and Vocational Training Plans

9.1 Industrial Development- Preliminary Analysis and Recommendations

9.1.1 Changing Employment Scenario and Value Added

The bases of the analysis, presented in the following paragraphs, is the Pakistan Economic Survey 2004-05 that takes into account various changes including change in the number of employees and the value added from six key sectors during the period between 2001/02 and 2003/04.

In the mining, quarrying and manufacturing, wholesale and retail trade and restaurants and hotels, and transportation, storage and communication sectors growth of employment was smaller than that of value added; it also implies that the labour productivity increased. In the financing and insurance, the construction, and agriculture, forestry, and hunting and fishing sectors growth of employment was greater than that of the value –added; which means that the productivity decreased in these fields. In the construction sector, value added decreased while employment increased during the same period. Although it may not be appropriate to directly apply the data to future planning, the employment elasticity to the value added was around 0.7 for the six sectors combined during the period. It is noted that MTFD estimates the overall employment elasticity to the total GDP for the period of 2005 – 2010 at 0.40, considering the productivity improvement during the period.

Table: Changes in Number of Employees and Value-Added

Year	Data item	Total of these 6 sectors	Agriculture, forestry, hunting & fishing	Mining, quarrying & manufacturing	Construction	Wholesale & retail trade & restaurants & hotels	Transport, storage & communication	Financing & insurance
2001 - 02	Employees (1,000)	32,510	16,370	5,380	2,350	5,770	2,290	350
	Value-added (million Rp)	2,868,218	904,433	647,872	89,241	667,615	427,296	131,761
	Value-added/employee (Rp)	88,226	55,249	120,422	37,975	115,705	186,582	376,460
2003 - 04	Employees (1,000)	35,150	17,970	5,730	2,430	6,180	2,400	440
	Value-added (million Rp)	3,208,946	962,527	789,242	86,402	764,688	470,015	135,972
	Value-added/employee (Rp)	91,290	53,563	137,739	35,556	123,736	195,840	309,027
Growth rate of employees/growth rate of value-added		0.98	1.02	0.94	1.03	0.97	0.98	1.10
Elasticity of number of employees to value-added		0.69	1.51	0.31	-1.05	0.50	0.49	7.65

(Source: Pakistan Economic Survey 2004 - 05)

Based on the Census of Manufacturing Industries 2000-2001, changes in the contribution to GDP per employee in the manufacturing industries between 1995/96 and 2000/01 were analyzed and are presented in the ensuing paragraphs. On average, the annual rate of change in the number of employees was 0.93 of the contribution to GDP. The employment elasticity of the overall manufacturing industries to the contribution to GDP is preliminarily estimated at 0.35. Although the results are based on sample surveys and should not be regarded as accurate estimates, it is thought that the sector's labour productivity increased during the period, except for the electrical machinery and supplies and the other chemical products.

Table: Changes in Number of Employees and Contribution to GDP by Major Manufacturing Group

Major groups	Codes	1995-96 average daily employment	Contribution to GDP (million Rs.)	Contribution per employee to GDP (Rp)	2000-01 average daily employment	Contribution to GDP (million Rs.)	Contribution per employee to GDP (Rp)	Growth rate of employees /growth rate of contribution to GDP	Employment elasticity to contribution to GDP
All manufacturing industries	3	561,919	181,021.5	322,149	689,692	320,699.5	464,989	0.93	0.35
Food manufacturing	311, 312	78,212	27,742.8	354,713	73,303	44,554.9	607,818	0.90	-0.13
Manufacture of textiles	320, 321	226,377	40,195.8	177,561	315,617	80,357.0	254,603	0.93	0.46
Wearing apparel	322	13,676	2,252.8	164,727	51,078	8,621.6	168,793	1.00	0.98
Ginning & baling of fibers	325	8,806	2,258.4	256,462	15,267	9,981.7	653,808	0.83	0.34
Drugs & pharmaceutical products	350	21,039	4,243.4	201,692	24,617	16,597.2	674,217	0.79	0.10
Industrial chemicals	351	20,037	15,567.9	776,958	15,631	27,364.1	1,750,630	0.85	-0.41
Other chemical products	352	9,037	5,542.3	613,290	10,618	5,680.8	535,916	1.03	6.62
Other non-metallic mineral products	369	15,916	14,052.2	882,898	13,539	15,976.6	1,180,043	0.94	-1.22
Iron & steel	371	33,199	8,317.6	250,538	24,289	16,768.8	690,387	0.82	-0.40
Electrical machinery & supplies	383	20,327	14,305.4	703,763	19,254	11,434.4	593,871	1.03	0.25
Transport equipment	384	13,853	6,297.5	454,585	19,972	10,525.7	527,023	0.97	0.70
Others		101,440	40,245.4	396,741	106,507	72,836.7	683,868	0.90	0.08

(Source: Census of Manufacturing Industries 2000-2001)

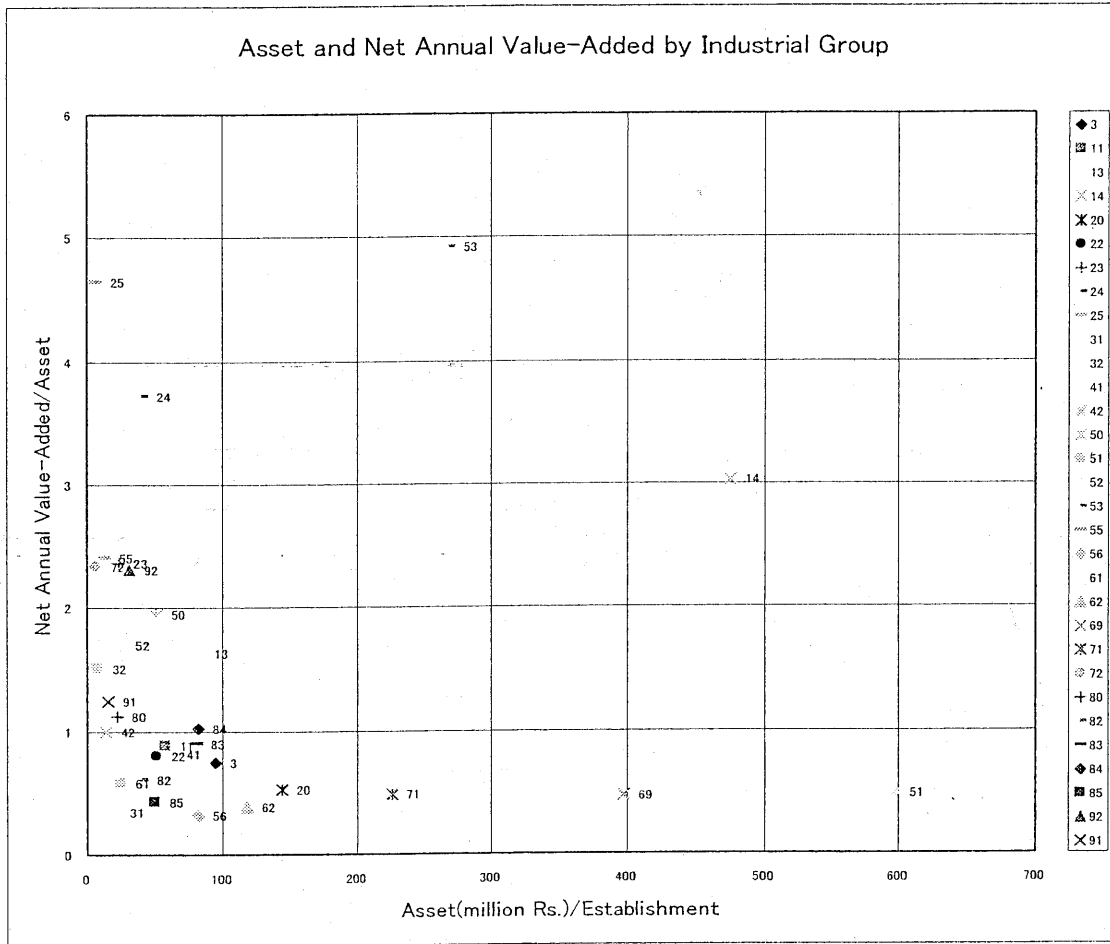
9.2 Characteristics of Manufacturing Industries

Some characteristics of manufacturing industries in Pakistan can be identified from the data available in the Census of Manufacturing Industries 2000-2001. First of all, the three-digit industrial groups are placed in figure 9-1 according to the asset (in million Rs.) per establishment at the horizontal axis, and according to the net annual value-added per asset at the vertical axis. If we place a group on the right-hand side of the graph, the average size of the establishment is large; if it is placed upward the capital efficiency is high and the area of the rectangle formed at the placement point and the origin presents the net annual value-added (million Rs.) of an average establishment. The employment cost is included in the value-added. For example, the industrial chemicals (351), the other non-metallic mineral products (369), and the iron and steel

(371) are of large scale but their capital efficiency is not very high. On the other hand, the ginning and baling of fibers (325), and the foot-wear except rubber or plastic (324) are not of large scale but their capital efficiency is very high. The tobacco manufacturing (314), and the petroleum refining and products of petroleum and coal (353, 354) are very large and very capital efficient.

Figure: Asset and Net Annual Value-Added by Industrial Group

(Source: Census of Manufacturing Industries 2000-2001)



Legends			
Reference number and industrial group (“3” of the first digit is omitted.)		52	Other chemical products
3	All manufacturing industries	53 (&54)	Petroleum refining & Products of petroleum & coal
11 (&12)	Food Manufacturing	55	Rubber products
13	Beverage industries	56	Plastic products
14	Tobacco manufacturing	61	Pottery, china & earthenware
20 (&21)	Manufacture of textiles	62	Glass & glass products
22	Wearing apparel	69	Other non-metallic mineral products
23	Leather & Leather products	71	Iron & steel
24	Foot-wear except rubber or plastic	72	Non-ferrous metal basic industries
25	Ginning & baling of fibres	80 (&81)	Fabricated metal products
31	Wood, wood & cork products	82	Non-electrical machinery
32	Furniture & fixtures, not metal	83	Electrical machinery & supplies
41	Paper & Paper products	84	Transport equipment
42	Printing and publishing	85 (&86)	Scientific & measuring instruments & Photographic & optical goods
50	Drugs & pharmaceutical products	92	Sports & athletic goods
51	Industrial chemicals	91 (93&94)	Handicrafts and other manufacturing

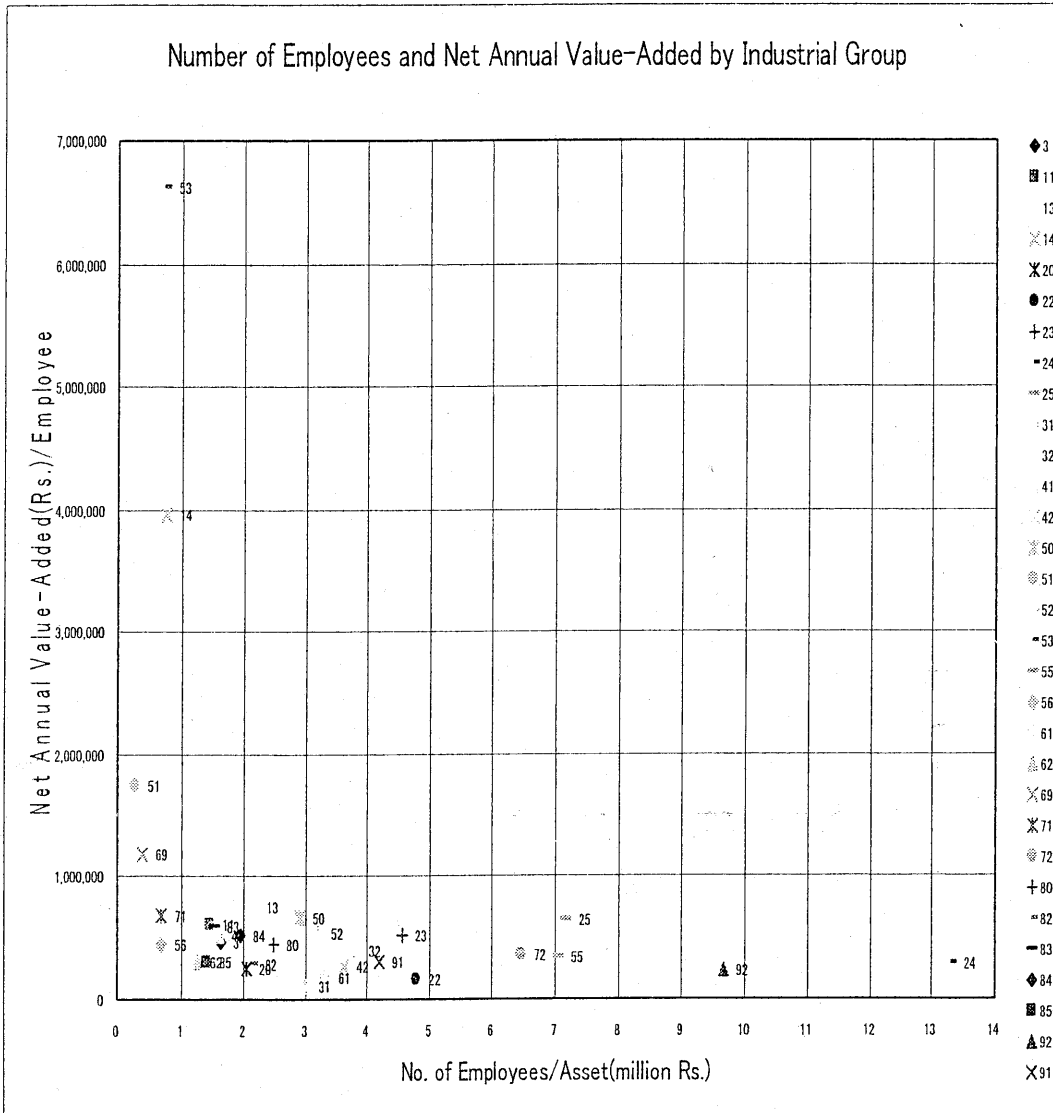
Secondly, the industrial groups were placed according to the number of employees per asset (million Rs.) at the horizontal axis and according to the net annual value-added (Rs.) per employee at the vertical axis. If a group is placed on the right-hand side, it is

generating more employment. If it is placed upward, the labour productivity is high, and the area of the rectangle formed by the placing point and the origin presents the net annual value-added per asset (millionth). For example, the foot-wear except rubber or plastic (324), the sports and athletic goods (392), the ginning and baling of fibers (325), the rubber products (355), the non-ferrous metal basic industries (372), the wearing apparel (322), the leather and leather products (323), and the handicrafts and other manufacturing (391,393,394) efficiently generate employment, although their labour productivity is not very high.

On the other hand, the petroleum refining and products of petroleum and coal (353,354), the tobacco manufacturing (314), the industrial chemicals (351), and the other non-metallic mineral products (369) show high labour productivity but do not efficiently generate employment because of their capital intensiveness. The iron and steel (371), and the plastic products (356) are also ineffective in attracting and creating jobs. It is however noted that indirect effects on job creation are not considered here.

The above analyses only take into account the industrial groups having visible characteristics. For further study on the trends of industrial development, it is suggested that characteristics of all of the industrial groups should be identified and evaluated especially in terms of their job creation effects and the degree of processing.

Figure: Number of Employees and Net Annual Value-Added by Industrial Group (Source: Census of Manufacturing Industries 2000-2001)



9.3 Industrial Development- Future Direction

Pakistan is certainly going in the right direction by deciding to go for a broad-based industrialization. There surely is a pressing need for improving the trade deficit situation and respond more actively to the growing demand for urban and regional cooperation in the coming years. Another positive step forward could be to develop resilient industrial networks for providing much need cooperation and support to industries and SMEs.

Going back to the issue of improving the employment scenario Pakistan needs to capitalize on the existing potential, which means that in addition to the textile industry

following industries can also play an instrumental role in creating jobs with relatively higher value added.

- Machinery and machine parts (including transportation equipment)
- Electronics/electrical machinery and equipment
- Information and communication technologies
- Construction and regional development

Education and training institutes may be encouraged to generate graduates having sound theoretical and practical knowledge so that they could provide high quality services in the fields mentioned above in particular and in other fields in general. The apprenticeship programmes can be made even more useful just by applying some monitoring perspectives and making them more regular than they are at the moment. The monitoring may help in identification of areas that need to be strengthened, added or excluded from the programme as per the changing scenario in the country, so as to respond more positively to the changing demand for the labour force in the country.

It is also crucial to continue on the course adopted for addressing the issues identified by the investment climate survey undertaken by the World Bank, i.e., improving access to financing and cost of financing, simplifying tax administration, improving tax rates, preventing corruption, maintaining economic and regulatory policy certainty, improving electric supply, maintaining macroeconomic stability, improving customs and trade regulations, reducing crime, theft and disorder, and stopping anti-competitive or informal practices.

While developing industrial estates in districts, it may also be beneficial to encourage technical and managerial upgrading of industrial enterprises through linkages development and mutual cooperation.

10. Educational Indices and Target Groups in the Human Resource Development Plan, and Corresponding Issues

10.1 Current State of Non Attendance

According to the census conducted in 1998, the percentage of children in the age group between 5 and 9 years old, who do not attend compulsory primary schools is 58%. The non-attendance rate among children between 10 and 14 years old (middle school) is 42%, with the total average of 51% for the age group between 5 and 14 years old.¹ In absolute figures, approximately 19 out of 37 million children in the age group between 5 and 14 do not attend school.

10.2 Current State of Drop-out

As pointed out earlier, the MTFD data indicates high drop-out rates at all levels of the formal education system, i.e., approximately 63% for primary schools, 50% for middle schools, and 75% for secondary schools. These percentages are equivalent to 11 out of 17 million, 3.25 out of 6.45 million, and 2.4 out of 3.2 million, respectively.

10.3 Human Resource Development Plan: Target Group

The Pakistan government intends to focus on dropouts from the formal education system with a mandate to involve them in the technical education and vocational training activities. It is estimated that there are about 11 million drop outs and the Government plans to train and create at least one million new skilled workers from the drop outs lot by the end of 2010.

However, it appears that the student absorbing capacity of existing technical education/vocational training institutes is just 0.5% of the whole population of dropouts. In other words vocational training institutes can accommodate only 90,000 students out of 300,000 potential students older than 15 years. It has also been observed that at present there is no facility that may provide technical education to people younger than 15 years of age.

¹ Source: Population Census Organization Statistics Division 1998

11. Current State of Technical Education and Vocational Training

11.1 General Overview and Challenges

This chapter provides an overview on the technical education and vocational training scenario prevailing in all four provinces including Sindh, Balochistan, Punjab, and NWFP. More specifically this chapter is dedicated to reflect on the educational institutions operating under the government administration. Let us now briefly, first of all, look at the scenario within a variety of institutions providing technical education and vocational training. They can broadly be described as follows:

Government College of Technology: It offers higher education for graduates of polytechnic or monotechnic institutes, who have already completed a three-year programme and have obtained the Diploma of Associate Engineer (DAE). Graduates having completed Bachelor of Technology (B.Tech), a two-year programme, with good grades are entitled to participate in an additional two-year programme and can receive the Bachelor of Technology (Honors). The institute is under Ministry of Education (federal government) and Department of Education (provincial governments).

Government Polytechnic Institute (teaching both male and female): This is a vocational training school for matriculates (general course) offering a three-year programme. The DAE is issued to graduates of the technology course and the Diploma of commerce to graduates of the commerce course. This institute is also operating under the supervision of Ministry of Education (federal government) and Department of Education (provincial governments).

Technical Training Center/Vocational Training Center: This is a vocational training school under the jurisdiction of Ministry of Labour (federal government) and Department of Labour (provincial governments). It is intended for persons who have completed the eighth or tenth grade. The center offers separate programmes for males and females. The longest course is of year's duration, whereas short-term courses last between two weeks and six months. Diploma or certificate is granted according to the enrollment period and course. Trainees can acquire G-II or G-III level skills according to NTB's vocational skill standard (48 types).

Apprenticeship Training Center: This vocational training institute was established for the purpose of conducting in-house training and is also under jurisdiction of Ministry of Labour. It was established in 1962 under the authority of the Apprenticeship Training Ordinance.

An overview of the types of certificates issued by the technical education and vocational training institutes to their graduates and the number of institutes in each province is presented in the table in the table below.

Number of TEVT Institutions by Province

Institutions	Degree offered	Number of Institutions				
		Punjab	Sindh	Balochistan	NWFP	Total
Government College of Technology	Degree	7	4	-	1	12
Government Polytechnic Institute for Girls	Diploma	4	50	1	1	80
Government Polytechnic Institute for Boys	Diploma	13		1	10	
Government Technical Training Institute TTC/Apprenticeship	Diploma	133	22	-	-	155
Vocational Institute (Woman)	Certificate, Diploma	128	80	12	11	265
Vocational Institute (Men)	Certificate, Diploma	2			32	
Total		287	156	14	55	512

As discussed earlier, technical education is under the jurisdiction of the Ministry of Education, whereas, vocational training is under s Ministry of Labour. The former is responsible for policy making and programme formulation in the field of education, and the latter in the field of labor administration. IN the provinces, although the name of the responsible organization may vary, departments or other offices in charge of education and labor administration are in charge of technical education and vocational training, respectively. Under this institutional framework, however, problems arise relating to the absence of a unified system or lack of coordination of policies and activities between responsible federal agencies, between the federal and provincial governments, and between provincial governments.

To respond to the issue of lack of coordination NAVTEC has been established (in December 2005,) with a mandate to coordinate policies and programmes of related departments and organizations at federal and provincial levels. Apart from this the

general scenario of technical education and vocational training may be broadly described as follows:

- Operating costs of related educational and training institutes are mostly borne by provincial governments and the federal government is only responsible for policymaking and programme formulation and does not provide subsidy or other form of support to provincial governments.
- Provincial budgets are not sufficient for providing technical education and vocational training according to the federal government policies. Similarly they are short of and needed for curriculum modification, retraining teachers, and operation and maintenance of facilities and equipment.
- Vocational training schools operated in each province have courses that have been established with the support of private enterprises, such as CMC (Center Management Committee). However, most committees are not adequately functional.
- The National Training Board (NTB) under Ministry of Labour has established skills standards for 48 occupational skills and provides it as a road map for promotion of skilled workers. And the list of occupational standards has also been expanded to meet industrial demand. However, institutes do not provide education according to such standards because of obsolete or inoperable equipment, shortage of latest equipment, and/or the lack of teaching skills.
- Ministry of Education has not established any standard for technical education.
- There are jurisdictional conflicts in programme implementation at provincial levels, e.g., between Departments of Education and Labor, impeding coordinated activities.
- Individual educational and training institutes have limited authority relating to their management and operations. For instance, NISTE designs a course curriculum with prior consultation with each institute, and even then the budget requests by institutes for upgrading of their training equipment are rarely accepted.

11.2 Promotion of the Technical Education/Vocational Training; Emerging Challenges

In promoting the technical education/vocational training programme under the human resource development plan, the Pakistan government is facing a number of challenges that have been shared during the study and have been summarized below.

- Within the federal government, no minister or ministry has assumed the leadership for promotion of technical education and vocational training.

- There are notable variations in course and curriculum between technical education and vocational training, partly because they fall under the jurisdiction of different ministries.
- Existing technical education and vocational training does not meet actual needs of industry primarily because no specific need assessments have been done keeping in view the changing industrial sector. It is for the same reason that the course content or curriculum is updated neither timely nor on regular basis.
- At present there is no uniform policy in terms of the minimum qualification requirement for obtaining admission in the training institutes between the two departments. It is perhaps due to the same reason that there is a visible difference in student's abilities to perform among different institutes.
- Another pertinent issue is the management of quality education. The evaluation systems, testing standards, and grading methods are not fully and uniformly followed. The absence of evaluation guidelines is perhaps another key area requiring immediate attention.
- Present education and training has not yet reached to international standards primarily because courses and curriculums do not follow international standards and there are no guidelines that may ensure that a certain level of standard is maintained in each institute.
- There is an apparent shortage of machinery and equipment needed for imparting modern age technical education and vocational training. At the same time it is not possible to provide contemporary technical and vocational training on the old and outdated equipment.
- Present education and training does not receive sufficient cooperation or support from industry, e.g., most companies do not have on—job-training for learners.
- As teachers do not have a very high social standing nor are paid well, therefore, their teaching capacity and motivation is generally low. Moreover, there is no refresher training system for teachers combined with the fact that there is shortage of facilities and equipment therefore, the present environment is not conducive for improving the quality of education as well as strengthening of teaching skills.

11.3 Sindh Province

11.3.1 General Overview

Sindh accommodates major cities including Karachi and Hyderabad. According to the 1998 census data, the province has a total population of approximately 30.5 million. Karachi is the largest city with around 10 million inhabitants.

The Province is divided into Division, Districts, Tehsils and Union Council. According to the 1998 census the administrative set up of Sindh Province is as follows:

Administrative unit	Division	District	Tehsil* ¹
Total area			
140,914 Km ²	5	21	143

(Source: 1998 Census Handbook of Population and Housing Census Sindh)

The break down of the province's rural and urban population is presented below.

	All area			Urban area			Rural area		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
Total	29,991	15,823	14,168	14,662	7,792	6,869	15,329	8,031	7,299

(Number in 1,000., Source : 1998 Census)

The break down of literacy data, i.e., area wise and gender wise, according to the 1998 census, is as follows:

	All area (%)	Urban area (%)	Rural area (%)
Both sexes	45	64	26
Male	55	70	38
Female	35	57	12

(Source: 1998 Census Handbook of Population and Housing Census Sindh)

There is a marked difference in literacy rate between urban and rural areas, while the latter being much lower than the former. In urban areas, there are significant differences between male and female and between districts. Generally, the literacy rate gets higher in the central part of a city. The following table shows geographical distribution of literacy rates within Karachi District, which show the highest literacy rate in the province.

	All area			Urban central area			Urban fringes area		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
Total	65	70	60	66	70	60	47	55	38
Central	76	78	74	76	78	74	-	-	-
East	73	76	70	73	76	70	-	-	-
South	68	72	63	68	72	63	-	-	-
West	56	62	48	57	63	49	45	51	38
Malir	54	61	43	56	63	45	49	59	38

(Source: 1998 Census Handbook of Population and Housing Census Sindh)

(All numbers in %)

11.3.2 Organization and management

Please refer to Annex i, which shows organizational structure of a technical education and vocational training institutes in Sindh.

In Sindh, Directorate of Technical Education (DOTE) under Department of Education and Literacy (DEL) is responsible for technical education, while vocational training falls under the jurisdiction of Directorate of Manpower and Training (DMT) under Department of Labor, Transport, Industries, and Commerce (DTIC). Both DEL and DOTE are performing key functions including policy formulation, planning, HR management, and budgeting for operation and maintenance of facilities and equipment, and recruitment and re-training of teachers in respective fields. DOTE and DMT are positioned as organizations to implement policies and programmes formulated by respective departments.

As pointed out earlier, the Sindh Government does have plans to establish TEVTA having a unified coordinating mandate to integrate two different departments of technical education and manpower under one umbrella. The implementation of the plan, i.e., establishment of TEVTA, has yet to take place. At present, formulation of technical education and vocational training plans is carried out under the leadership of DEL and DOTE. Both DEL and DOTE operate various educational and training institutes.

Please also refer to Annex ii, for specific information on Courses and Degrees/Diploma offered in the institutions.

11.3.3 Budget

Operating budget of educational and training institutes is mostly provided by provincial governments. Around 90% of the operating budgets are covering labour costs such as staff salary.

Operating costs by type of institute, the number of students of each institute, the total operating cost, and the cost per student are presented in the following table.

Type of educational institution	Number of students	Budget(PRs million)	Cost/student/year(PRs)
Government college/polytechnic /Monotechnic	19,948	351	17,600
Commercial colleges	2,484	117.4	47,274
Vocational institute & schools	2,943	72.3	24,579
Total	25,375	540.7	-

(Source: DOTE, Sindh Provincial Government)

At present, none of existing educational and training institutes are receiving sufficient operating budgets. Similarly, there are no funds available needed for the purchase of new machinery and equipment, and proper repair and maintenance of present equipment.

11.3.4 Quality of education and training

The existing institutes providing technical education and vocational training maintain a large number of course curriculums that do not march actual industrial needs. Furthermore, quality of the existing course curriculums has also gone down due to the non existence of an appropriate method needed for curriculum development. The situation looks even grimmer as the number of available text books is insufficient and so is the equipment. Some training institutes have a full set of machinery and equipment that has been provided under the aid of international organizations, but their curriculums often don't correspond to the actual needs of industry.

Evening shift courses, as seen in community colleges or technical colleges in the United States, are also offered, including those intended for skill development required by small shops and independent contractors, such as sheet metal working and sewing. These courses are mostly short term and are not of high standards in terms of quality, but they are very popular because they teach skills that are useful for job seekers and workers who wish to enhance skills.

Poor quality of education at the existing institutes partly is due to the low capacities of teachers. There are many reasons for this, including the lack of popularity as profession, the lack of opportunity for skill development, and limited access to information relating to teaching, such as small stock of books in libraries.

11.3.5 Current state of skills standards

This section analyzes as to whether technical education and vocational training is conducted according to skills standards established by National Training Bureau (NTB) under the Ministry of Labour, Manpower & Overseas Pakistanis. The similar analytical frame work is also applied to other provinces.

With regard to technical education and vocational training in Pakistan, formal skills standards are not established by the federal or provincial government or individual institutes that are under government supervision, except for the one established and maintained by NTB. NTB's skills standards cover 48 occupational skills, which are listed in Annex iii.

NTB's standards set forth very basic skill levels, which are divided into Grades I through III. For instance, the three skill levels for welding are defined in the NTB standard as follows.

- Grade III (The Basic Level) --- The Basic level relates to the level of knowledge and skill of beginning craftsman. This level should be attainable by graduate's level of approved training course or those who have had a minimum of 3 years "on the job" experience.
- Grade II (The intermediate level) --- This falls approximately midway between the advance level and basic level.
- Grade I (The advanced level) --- This is based on the highest level of knowledge and skill expected from a craftsman in the welding trade.

These standards are documented to present achievable skill levels and are not actively promoted or monitored. As a result, vocational training institutes in Sindh realize NTB's standards cover 48 job skills but none of them provide training according to the standards. NTB does not undertake periodical updating of skill levels, promotion and dissemination activities to the institutes, nor the monitoring of introduction and adoption. The institutes seem to simply neglect them although they are expected to reflect them in their course curriculum and contents.

Generally, most institutes are not aware of the concepts pertaining to skills standards, standardization, and quality control. They only have a general idea about ISO. They view ISO9000 or 14000 as certification that can be obtained by paying a fee to an organization and do not feel any need to obtain ISO certification.

The Trade Testing Board Sindh (TTBS) under the Department of Education conducts a graduation examination for graduates from the existing technical education and vocational training institutes. TTBS is responsible for administration of tests for both public and private training institutes upon request, accreditation and revocation of institutes, the issuance of certificates and diplomas. It is also in charge of standardization of graduation examinations directly administered by TTBS, and the crackdown on wrongdoings related to administration of tests. Nevertheless, tests are considered to be of poor quality partly because they reflect course contents.

11.3.6 Training of teachers

Minimum qualification set for teachers at the existing technical education and vocational training institutes is that they should be DAE holder with a few years of field experience at private enterprises. Few companies have teacher-training programmes, which are conducted by some large corporations and foreign enterprises for the purpose of training teachers on in-house courses. Some vocational training institutes are said to have teacher-training courses under the sponsorship of related industries but they are not very active and their effectiveness is unknown.

Generally, quality of teachers in terms of teaching capability and skills is believed to be fairly low and so are their salaries. Similarly, their social status is not generally recognized, and/or there is a general belief that people who cannot adapt themselves to the private sector choose to become teachers. Furthermore, teachers cannot benefit from

training programmes or information services that would help them upgrade their skills on a continuous basis.

11.3.7 Development of teaching materials

For textbooks and other teaching materials used for technical education and vocational training, there are specific guidelines that have been established by the federal government. NISTE creates, designs, edits and prints teaching materials according to the guidelines and distribute them to institutes through responsible departments or organizations in each province. For instance, in Sindh, DOTE and DMT are responsible for distributing textbooks to respective institutes. NISTE produces two types of teaching materials, i.e., the one used by students and the other designed for re-training of teachers.

Nevertheless, various problems similar to those seen in quality of education are also visible in the technical education and vocational training. For instance, most textbooks do not match up with the growing and changing needs of industry in terms of content. Clearly, they have been prepared without elaborate planning or need assessments. They are then used for the course curriculum that does not meet the current needs, resulting in poor quality of education and training. Furthermore, there is acute shortage of textbooks. The number of textbooks actually distributed to each institute is much less than the number of students. It is for the same reason that the students have to borrow the textbooks from a school library for reading.

11.3.8 Equipment and materials for training

Availability of equipment and materials for training varies greatly among schools and institutes. For instance, some educational institutes have a sufficient number and range of equipment that has been provided under assistance of an international organization making a sharp contrast to others that use very old equipment, even fifty years old. Also, some fail to use equipment provided under an aid programme due to the lack of maintenance.

The major problem is the extensive use of equipment that is fairly obsolete and has a predominant share. Also, there are many instances in which the machinery that requires service is left unattended and it has eventually become inoperable. In some institutes, around 80% of machinery and equipment is left unused.

For instance, equipment and materials kept at Jamila Millia Polytechnic Institute, and their operating conditions are summarized below. Note that the institute has not received any assistance from an international organization.

- ◆ An X-ray machine for the radiograph department: 20 – 30 years after installation.
- ◆ PCs in an exhibition room: Relatively old models based on Pentium I or II (three or four generations before) are displayed in the exhibition room and are also used by students.
- ◆ E-library: Copied versions of packaged software programmes are displayed in stacks, together with a few PCs. AutoCad (CAD software) is used for various courses.
- ◆ The library: It keeps textbooks for lending and has a few hundred books.
- ◆ TV repair laboratory: It uses very old models (30 years or older) for practical training.

On the other hand, equipment and materials owned by PAK-SWIDISH, which was established under the aid of the Swedish government, are summarized as follows.

- ✦ Machinery and equipment for the mechanical engineering course: A set of machine tools including lathes, which were donated in the 1950s and are still operable and used.
- ✦ CNC machines (double spindle): Two small units were procured in 1999 and are in operation. Repair of parts is done internally.
- ✦ Machine layout and operating conditions: Machinery and equipment are arranged to ensure efficient operation and are well maintained.

11.3.9 Course Content

Course content of institutes providing technical education is developed under the supervision of NISTE. However, many training institutes follow course content contained in commercially available teaching materials, which are largely based on the advice and supervision of the Skill Development Council (SDC) of Ministry of Labour.

Overall, course content being used in various technical education institutes is more or less the same.. This reflects the institutes are hesitant in investing enough time, intellectual interest and resources needed for the development of a unique curriculum that has its own well defined contents and wider scope for application. Similarly the trend towards developing more advanced level courses is also not very encouraging.

For the purpose of this report, course contents of the Government College of Technology (under the jurisdiction of Department of Education and Literacy) were analyzed in terms of adequacy and level of specialization in the field of computer information technology (CIT). In particular, the course content of Government College of Technology, Karachi, is taken up as an example. Courses directly relating to CIT, other than compulsory courses, are listed below.

S. #	Course Number	Subject	Theory ^{*1}	Practical ^{*2}	Credit ^{*3}
First Year					
1-1	Computer 113	Computer Application Software	1	6	3
1-2	Computer 114	Introduction to Computer Programming	2	6	4
1-3	Computer 121	General Engineering Workshop	0	3	1
1-4	Computer 123	Linear Circuit and Basic Electronics	2	3	3
Second Year					
2-1	Computer 213	Object-oriented Programming	2	3	3
2-2	Computer 225	Microprocessor Architecture	3	6	5
2-3	Computer 233	Data Communication and Networking	2	3	3
2-4	Computer 243	Analog Electronics	2	3	3
2-5	Computer 253	Digital Electronics	2	3	3

	Third Year				
3-1	Computer 313	Network Administration	2	3	3
3-2	Computer 323	Operating Systems	2	3	3
3-3	Computer 332	Web Page Development and E-Commerce	1	3	2
3-4	Computer 342	PC System Architecture	2	0	2
3-5	Computer 354	PC System and Peripherals & Repair	2	6	4
3-6	Computer 363	Project	0	9	3

*1: Theoretical lecture/week

*2: Practical lecture/week

*3: Credit: Normally one credit refers to one hour class held one time in a week.

For more detailed understanding please also refer to Annex iv. A brief description of the way the course has been organized and some correlating challenges have been identified below. Please also note that numbers in the text below correspond to those in the Annex iv.

- Overall most courses are general in nature, therefore, lacking a concentrated focus through which specialized training of CIT engineers could take place, e.g., programmer, network engineer, system administrator, or system engineer/analyst. Also, it is not clear as to whether their primary objective is to train hardware engineers (especially microprocessors) or software developers.
- Only one course category shows clear relevancy is Computer 114 and its advanced courses. It is further divided into two sub-categories, i.e., the one starting with the object-oriented programme development course, followed by the web development course, and the other consisting of data communication and network administrator courses (those shown by arrow 2 and 9 and 3 and 13).
- There are several hardware-oriented courses, but all of them are completed in the second year and few related courses are found in the third year, e.g., a combination of 1-3 and 2-2, and 2-4 and 2-5 (shown by arrows 4, 7 and 8), while