DOCUMENT RESUME

ED 391 030 CE 070 596

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TITLE The Development of Technical and Vocational Education in Pakistan--A Case Study in Quality Improvement. Case Studies on Technical and Vocational Education in Asia and the Pacific.
INSTITUTION Royal Melbourne Inst. of Tech. (Australia).
SPONS AGENCY United Nations Educational, Scientific, and Cultural Organization, Paris (France).
REPORT NO ISBN-1-86272-454-7
PUB DATE 94
NOTE 66p.; For related documents, see CE 070 584-598. Product of the International Project on Technical and Vocational Education (UNEVOC).
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS *Educational Development; *Educational History; *Educational Improvement; Educational Policy; *Educational Trends; Foreign Countries; Postsecondary Education; Secondary Education; *Technical Education; Technology Education; *Vocational Education
IDENTIFIERS *Pakistan

ABSTRACT

This report provides a general overview of technical and vocational education in Pakistan, with information on the country's economy, climate, population, and culture. It summarizes the history and present practices of these types of education in the country and suggests measures to improve the quality of teachers and instructors. Sixteen appendixes present tables of information on vocational education programs in the country. Some of the information provided in this overview includes the following: (1) at the time of Pakistan's independence in 1947, there were only two engineering colleges, a few vocational institutions, and no polytechnics; (2) at present, 45 polytechnics, 11 colleges of technology, and more than 400 vocational institutions have been established, with plans to double that number by the year 2002; and (3) much emphasis is being put on improving the quality of teachers and educational administrators. (KC)

UNEVOC

CASE STUDIES ON TECHNICAL AND VOCATIONAL EDUCATION IN ASIA AND THE PACIFIC

UNESCO

PAKISTAN

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The Development of Tehchnical and Vocational Education in Pakistan – A Case Study in Quality Improvement

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First published 1994

ISBN 1 86272 454 7

Published by RMIT for UNESCO

The UNESCO UNEVOC Case Studies on Technical and Vocational Education in Asia and the Pacific project was managed by:
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Printed by:
Communication Services Unit
Royal Melbourne Institute of Technology
GPO Box 2476V
Melbourne
Victoria
Australia 3001

UNEVOC is the International Project on Technical and Vocational Education which was launched by UNESCO in August 1992. In the field of technical and vocational education, UNEVOC aims to foster the international exchange of ideas, experience and studies on policy issues; strengthen national research and development capabilities; facilitiate access to data bases and documentation; promote innovations in staff development; and support international cooperative actions.

CONTENTS

KEY FACTS

Name of Country	Pakistan
Official Title	Islamic Republic of Pakistan
Area	796095 (sq km)
Population	117.320 million
Population Growth	3.1 per cent
Climate	Sub-tropical, semi-arid, characterised by two distinct seasons (Summer and Winter) and a monsoon period which brings heavy rains in most parts of the country from July through September.
Geography	Pakistan is located between 23 - 42 degrees and 36 - 55 degress north latitudes and 75 - 20 degrees longitudes. It is bound in the north and northwest by Afghanistan, in the east and south-east by India, in the south and by the Arabian Sea and in the west by Iran.
Official Languages	English, Urdu
Ruling Political Party	Pakistan Peoples Party
Head of Government	Benazir Bhutto
Currency Used	Rupee (1 US$ = approx. Rs.30)
Political System	Parliamentary system has two houses - the National Assembly and a Senate. The members of the National Assembly are elected directly by people of their constituencies and senators are elected by members of respective provincial assemblies and National Assembly. All the elected representatives elect a President who is the head of the state, the members of the National Parliament elect the Prime Minister who is the head of government.
Social Welfare	Government takes every step for the welfare of the public. Basic education and health care is free for the poor.
Economy	Mostly agricultural country. The share of agriculture in GPN is 25.7 per cent while that of manufacturing and trade is 18.5 per cent and 16.7 per cent respectively.
	G-DP = Rs. 474.905 (million)
	GNP = Rs. 484.030 (million)
	Per Capita Income US$ = 380
	Inflation Rate (average 1980-89) = 6.7 per cent

EXECUTIVE SUMMARY

At the time of independence in 1947 Pakistan inherited negligible TEVT facilities. There were only two engineering colleges, a few vocational institutions and not a single polytechnic. Keeping in view the imprtance of technicians and an adequately trained workforce, great efforts have been made to create a significant nework of technical education instutions. Over the period. 45 polytechnic, 11 colleges of technology and more than 400 vocational institutes have been established. However, the fact remians that the o- :t of all these institutions, even today, makes up a minority of the total workforce. The new education policy aims to double the number of polytechnics, colleges of technology , and vocational institutions by the year 2002.

According to the Constitution of Pakistan, the general policy planning and overall guidelines (including curricula, text books and standards of education) are the responsibility of the federal government, whereas implementation of the policy, programs and projects rest with the provincial governments. Various TEVT institutions are managed by different ministries and organisations of the government. Each institution has its own objectives and training programs which reflect a wide range of contents, structures, durations, entry qualifications and modes of training. The training programs prepare students for a variety of jobs in the labour market.

Technician training is carried out by Polytechnics administered by the Provincial Directorate of Technical Education. They offer three year post matric (high school - 10 years schooling) Diploma of Associate Engineering (DAE) courses in different technologies. Colleges of Technology offer B.Techn (pass) and B.Tech (Hons.) two year courses for the diploma holders. Training in commerce subjects is offered by commercial training institutions under the provincial directorates of technical education. They offer one year post matric course of C. Com and further one year of D. Com. Pre-vocational school level training is offered as a Agro-technical Scheme of studies at middle and secondary school level.

The relevance of training and general quality of the products of the technical education system has bot been found very satisfactory by the end-users i.e. industry. The quality of the output greatly depends on the quality of the teachers. Therefore, a great emphasis is placed on quality improvement of the teachers through training. A network of teacher training institutions has been established in the country. However, due to the scarcity of resources and the difficulty in sparing inservice teachers for training, the number of trained teachers is still very low.

It is estimated that 77 per cent of the commerce teachers and 46 per cent technical teachers have no teacher training. The rest have training of varying lengths, ranging from a few weeks to a year. There is an urgent need for training in such important components as psychology, methods, media, testing and evaluation, lab/ shop management etc. More than half of the teachers are diploma holders and they have to teach diploma students. Their subject upgrading is essential. Exposure to new and emerging technologies is necessary. No training is imported when a teacher moves from a lower to a higher level. In the majority of cases the teachers are promoted to administer the affairs of institutions without administrative training. It is observed that management training is necessary before a working teacher is promoted to manage any institution or department. Keeping in view the need and importance of quality improvement of the teachers it is suggested that all essential inputs for this purpose should be supplied by all concerned on priority.

ABBREVIATIONS

ABAD	Agency for Barani Areas Development
ADB	Asian Development Bank
ADP	Annual Development Plan
AIOU	Allama Iqbal Open University
ATC	Apprentice Training Centre
BPS	Basic Pay Scale
BTE	Board of Technical Education
CIDA	Canadian International Development Agency
DAE	Diploma of Associate Engineering
DEO	District Education Officer
DMT	Directorate of Manpower Training
DOE	Department of Education
DRDLG	Department of Rural Development and Local Government
DSW	Directorate of Social Welfare
DTE	Directorate of Techical Education
EEC	European Economic Community
FANA	Federally Administered National Area
FATA	Federally Administered Tribal Area
FY	Financial Year
FYP	Five Year Plan
GDP	Gross Domestic Product
GNP	Gross National Product
GOP	Government of Pakistan
GPI	Government Polytechnic Institute
GTZ	Gesellschast Technische Zusammenarbiet (Association for Technical Cooperation)
GVI	Government Vocational Institute
GVIW	Government Vocational Institute for Women
GVS	Government Vocational School
HRD	Human Resource Development
IBRD	International Bank for Reconstruction and Development (World Bank)
IDA	International Development Association (Soft Loan 'Window' of the World Bank)
IER	Institute of Education and Research
ILO	International Labour Office
ISCO	International Standard Classification of Occupations
ISIC	International Standard Industrial Classicification
LFS	Labour Force Survey
MIS	Management Information System
MOE	Ministry of Education
MOF	Ministry of Finance
MOHSESW	Ministry of Health, Special Education and Social Welfare
MOLMOP	Ministry of Labour, Manpower and Overseas Pakistanis
NEC	National Economic Council
NGO	Non Government Organisation
NSTI	National Staff Training Institute
NTB	National Training Board
NTDI	National Training Development Institute
NTTTC	National Technical Teachers' Training College
NVTS	National Vocational Training System
NWFP	North West Frontier Province
ODA	Overseas Development Administration (British)
OJT	On-the-Job Training
OFP	Overseas Pakistani Foundation
PBTE	Provincial Board of Technical Education
PC	Planning Commission
PEC	Pakistan Engineering Council

PED	Provinical Education Department
PSCO	Pakistan Standard Calssification of Occupations
PTB	Provincial Training Board
SBFC	Small Business Finance Corporation
SDC	Skill Development Centre
SIC	Small Industries Corporation
SITE	Sindh Industrial Trading Estate
STI	Staff Training Institute
SWD	Social Welfare Directorate
TAFE	Technical and Further Education
TEVT	Technical Education and Vocational Training
TTC	Technical Training Centre
TTTW	Technical Teaching Training Wing
TVE	Technical and Vocational Education
UGC	University Grants Commission
UN	United Nations
UNDP	Untited Nation Development Programme
UNHR	United National High Commission for Refugees
UNICEF	United National International Children's Emergency Fund
USAID	United States Agency for International Developments
VTC	Vocational Training Centre
WAPDA	Water and Power Development Authority

1. GENERAL OVERVIEW

1.1 EMERGENCE OF PAKISTAN

The Islamic Republic of Pakistan emerged on the map of the world on August 14, 1947 as a result of the partition of former British India. It comprises four provinces, namely, North-West Frontier Province (NWFP), Punjab, Sindh and Balochistan with the Federal Capital at Islamabad and a Federally Administered Tribal Area (FATA).

1.2 LOCATION AND GEOGRAPHY AND CLIMATE

Pakistan stretches over 1,600 kms north to south and is about 885 kms broad east to west, lying between the latitudes of 23°30' East. It comprises four provinces: Baluchistan, North-West Frontier, the Punjab and Sind. Of these, Baluchistan is the largest province, with an area of 347,188 sq. kms, followed by the Punjab with an area of 206,251 sq kms, inclusive of the Federal Area. Sind has an area of 140,913 sq kms, North-West Frontier 74,522 sq kms and the Federally Administered Tribal Areas (FATA) cover 27,221 sq kms. The total area is 796,095 sq kms.

Pakistan is a land of diversified relief. In the north, it is bounded by the Himalayan Ranges, the Karakoram Range, and the Hindukush beyond it. The Himalayas have an average elevation of 6,100 metres with some of the highest peaks in the world. K-2 (Mount Godwin Austin), 8,616 metres, is the highest peak of the Karakoram Range, while Tirich Mir, 7,736 metres, is the highest peak of the Hindukush. Below the Karakorams is the parallel range to the Himalayas extending far to the east and on the west, ending up at the Nanga Parbat peak, 8,215 metres.

In the west, it has a 2,252 kms long common border, known as Durand Line, with Afghanistan. To the south of the Durand Line, there is a common border of about 805 kms with the Islamic Republic of Iran. The Arabian Sea lies in the south. To the east is the Indian territory of East Punjab and Rajasthan with a common border of about 1,610 kms.

Out of the total area of 796,095 sq kms, about 475,884 sq kms in the north-west and west form a highly differentiated mountainous terrain. The remaining 320,211 sq kms present a flat and gradational surface. The whole land, excluding most of Baluchistan, falls into the hydrological unit drained by the Indus system of rivers. The unit includes the north-western hills, northern and north-western submontane, upper and lower Indus plains and parts of Baluchistan, which is a region of small rivers. Large parts of it form areas of inland drainage.

Pakistan comprises six major physical divisions or regions: (i) northern mountains; (ii) western off-shoots of the Himalayas; (iii) Baluchistan plateau; (iv) Potwar plateau and the Salt Range; (v) upper and lower Indus plains; and (vi) the Thar desert.

The northern section, forming the western ranges of the Himalayas, occupy a large area in Kashmir and cover the northern part as far as Gilgit. This is the broadest section of the Himalayas lying in the difficult mountains terrain. The altitude decreases towards the south but due to increasingly aridity, the border is difficult to negotiate. The middle portion contains some passes, which carry a historic value in breaking the isolation of South Asia and have made communications possible. The Babusar Pass, 4,554 metres high, connects Abbottabad with Gilgit; Lowari Pass, 3,120 metres, connect Peshawar with Chitral; and Shandur Pass, 3,723 metres, connect Chitral with Gilgit. The northern mountains intercept winds from the Arabian Sea and the Bay of Bengal, and on this depends the rainfall. They also act as a great barrier to cold winds coming from Central Asia towards the plains of Pakistan.

The Western off-shoots of the Himalayas stand in the west of the Indus plain. From the Hindukush to the Kabul river, there are three major ranges, between them flow Swat, Panjkora and the Chitral - Kunar rivers. South of the Kabul river, the Koh-e-Sofaid range (3,690 metres) runs east-west. The Kurran river flows south

of the range, and between the Kurran and the Gomal rivers, is the Waziristan hills area. The Koh-e-Sulaiman runs southward from the Gomal river for a distance of about 777 kms with Takht-e-Sulaiman (3,385 metres) separating the Indus plain from the Baluchistan plateau. The historic Khyber Pass, starting from Jamrud, 16 kms from Peshawar, runs for 37 kms up to Torkham (a check post on the Pak-Afghan border) which lies in the south of river Kabul, while Bolan pass connects Quetta with Sibi.

The Baluchistan Plateau consists of dry valleys, saline lakes and a vast area of desert with dry hills, generally running from north-east to south-west. The Toba Kakar and Chagai ranges run along the Pak-Afghan border. The Central Brahui and Mekran ranges occupy the central portions, and the coastal Mekran range runs almost east-west. To the south of this range is the narrow coastal plain of Baluchistan. The mountains in the north-west contain fairly large deposits of coal, iron, chromite, copper and other minerals.

The Potwar Plateau, varying in height from 305 to 610 metres above sea level, lies to the north of the Salt Range. The plateau is drained by the Haro and Soan rivers. Its topography is extremely varied, consisting of ridges, troughs and basins. A large part of the plateau has been eroded and dissected by streams. The Range starts from near the Jhelum district in the Jogi Tilla and Bakrala ridges. Near Kalabagh, it crosses the Indus and tends southward into the districts of Bannu and Dera Ismail Khan. The average height of the range is about 671 metres and the Sakesar peak is 1,525 metres high. This range contains huge quantities of rock salt, besides gypsum and coal.

The Indus plain, covering an area of about 16,100 kms is the most prosperous agricultural region of the country. It extends for 1,050 to 1,130 kms from the rim of the Potwar plateau southward to the Arabian sea. Its northern zone comprises the province of the Punjab while the southern zone is mainly the province of Sind. The river Indus, having its source in lake Mansorowar in Tibet, flows through almost the whole of Pakistan. Sutlej, Beas, Ravi, Chenab and Jhelum rivers have long courses in this region with extensive catchment areas. With an average gradient of 19 cm to a km the Indus plain slopes gently to the sea. It is divided in the Upper and Lower Indus plains and is a region of micro relief. The Upper Indus plain is divided into a number of doabs, meaning the land lying between the two rivers. The Rechna Doab is between the rivers Ravi and Chenab while the Sind Sagar Doab, also known as Thal and the largest of the doabs, lies between the rivers Jhelum, Chenab and Indus. The lower Indus plain begins from below Mithankot. These plains have been formed due to the changing course of the river Indus. The flow of the river Indus is very slow and the silt that it carries is mostly deposited on its bed thereby raising it above the level of the sandy plain. The bunds constructed on either side of the river protect the land.

The Thar desert lies in the south-east of the Lower Indus plain and, being a part of the larger Rajputana desert, extends into Pakistan from India and has lakes in its depressions.

The Rann of Kutch, divided between Pakistan and India under the 1968 agreement, lies on the east of the sub-region of the delta, south of Thatta in the province of Sind, and consists of a marshy salt plain almost flush with sea level. Besides having some pastures, it is an old silted up marine gulf and is flooded with sea water during the monsoons.

The Sub-tropical, semi-arid areas are characterized by two district seasons (summer and winter) and a monsoon period which brings heavy rains from July through September in most parts of the country.

TABLE 1

Mean temperature and rainfall at selected centres in 1990

		Mean temperature °C		Rainfall
		Minimum	Maximum	(m.m.)
1.	Karachi	20.2	32.4	82
2.	Lahore	17.7	30.7	433
3.	Peshawar	15.5	27.3	329
4.	Rawalpindi/ Islamabad	14.2	27.6	995
5.	Quetta	8.8	25.1	312

Hottest Month	June
Coldest Month	January
Driest Month	October
Wettest Month	July

1.3 SOCIAL FACTORS

The social factors of any nation are known by how people live, what people speak, their culture and their religious approach. Pakistan has inherited one of the oldest civilizations in the world with modern set up of technological development.

1.3.1 PEOPLE

South-Asia has attracted migrants from both the north-east and north-west from time immemorial. For thousands of years, people have entered through these routes settling and mixing with the local population. These includes Dravidians, Aryans, Greeks, Turks, Persians, Afghans, Arabs and Moghals. However, the dominant racial type in Pakistan is the Indo-Aryan. Some people in the Kalat region have Dravidian traces. The Baluchies and Pathans are predominantly a mixture of Turks and Iranians, two of the important branches of the Arayans.

The history of the Baluchies reflect their valour, love of freedom and fear of God. They lead a simple life and are honest and straight forward. Their hospitality is famous the worldover.

The Pathans of the North-West Frontier are born fighters. They are industrious and hard-working. They have a literary bent of mind and have produced poets and writers. Their hospitality has been a by-word throughout the history.

The Punjabi are mainly farmer-soldiers, though they are efficient and hard-working in other occupations too. They are usually tall, well-built and active, forward-looking, disciplined and industrious, they make very fine soldiers. The bulk of the fighting potential of Pakistan's Armed Forces is provided by the people of the Punjab. They have produced the national poet, thinker and a great philosopher, Allama Dr Muhammad Iqbal, who put forward the idea of Pakistan. The Punjabi culture is rich with folk songs and dances — Luddi and Bhangra.

The Sindhi way of working and living has a direct impact of Islam. Sind is known as Bab-ul-Islam (Gateway to Islam). The fine handicrafts that are characteristic of the Sindhi region reflect all the traditions and influences the rich sindhi lore. The Sind is also known as the Land of Saints.

On the whole, the people of Pakistan love freedom and by working hard, they are determined to make their country strong. Their hopes and aspirations for the future are very high. They want to bring in prosperity and peace. They are united and stand like a rock to defend their beloved homeland against any aggression. They believe that a day's life of a lion is much more honorable than a thousand years' of life of a jackal.

1.3.2 RELIGIONS

The majority of the population of Pakistan is Muslim, but a small minority of Hindus, mostly big landlords, is settled mainly in the border districts of Sind. Christians are widely spread and form about 3 per cent of the total population. An economically notable minority is that of the Paris numbering between 15,000 to 20,000, mostly settled in Karachi. With the exception of the Head of the State and the Prime Minister, every post is open to all. The Constitution of Pakistan guarantees the right to profess, practice and propagate their religions. There are elected representatives both in the Federal and Provincial Legislatures and the local bodies.

1.3.3 LANGUAGES

A number of languages are spoken in Pakistan. All belong to the Aryan age with the exception of Brahui which is spoken by a small number of people in the Kalat region. These languages heavily lean on Persian and Arabic. Baluchi, due to the area's geographical affinity to Iran, is more akin to the Persian than any other language. Urdu is the national language and forms a common linguistic link between the people of various regions.

1.3.4 LITERACY

According to the 1981 Census, the literacy rate increased from 21.7 per cent in 1971 to 26.2 per cent in 1981 showing a growth rate of about half a per cent. The male literacy stood at 35.05 per cent as against 15.99 per cent for the female population. Of the Muslim population of 10 years and above, 38 per cent can read the Holy Quran and Urdu is the fifth most spoken household language of the country. Out of 13 million people who had some education, 46 per cent had passed primary education, 2.3 per cent middle and 20 per cent matric. The per centage fell to 5.9 in the case of intermediate, 3.8 for graduates and only one for master degree holders. The per centage for professional graduates is still low 0.28 for engineering, 0.25 for medicine and 0.28 for law. Of the total population having passed primary, middle and matric, the share of women was 30.7 per cent, 24.6 per cent and 23.5 per cent respectively. It stood at 22.3 per cent for medical education and 3.1 per cent for law. The literacy per centage in urban areas stood at 47.12 and in rural areas at 17.33. The highest literacy rate of 31.45 per cent is in Sind, followed by 27.42 per cent in the Punjab, 16.70 per cent in NWFP, 10.32 per cent in Baluchistan and 6.38 per cent in FATA. The Federal Capital, Islamabad recorded a literacy per centage of 51.75.

1.4 ADMINISTRATION

TABLE 2

	DIVISIONS	DISTRICTS	AGENCIES	TEHSILS UNION	VILLAGES	COUNCILS
1. Federal Capital Area	-	1	-	1	12	132
2. Punjab	8	32	-	109	2735	25846
3. Sindh	4	18	-	80	831	5885
4. NWFP	7	20	-	#47	830	7100
5. Balochistan	6	25	-	$109	399	6577
6. FATA	-	-	*12	42	13	2621
Total	25	96	12	388	4820	48161
7. Azad Kashmir	-	5	-	17	202	1558
8. FANA	-	5	-	21	113	577
Grand Total	25	106	12	426	**5135	50296

* Includes 7 Agencies & Tribal Areas. ** Includes 613 other Local Councils.
\# Includes 21 Tehsils of un-settled part of NWFP (Chitral, Dir, Malakand PA & Kohistan)
$ Includes 55 Sub-Tehsils.

TABLE 3 POPULATION AND LABOUR FORCE - (1992)
(Million Nos.)

Description	Pakistan	Punjab	Sindh	NWFP	Balochistan
Total Population	117320	*64409	27805	^16307	8799
Growth (%)	3.1	2.7	3.6	3.3	7.1
Share (%) in Pakistan Population	100.0	54.9	23.7	13.9	7.5
Density (Persons/Sq. Km.)	147	312	197	160	25
Rural population (Share %)	71.7	72.4	56.7	84.9	84.4
Adult literacy rate (%)	26.2	27.4	31.5	16.7	10.3
Total labour force	33823	19231	7841	4211	2540
Employed (%)	96.9	96.5	98.3	95.5	99.3
Labour force engaged in (%):					
i. Agriculture	51.2	51.5	47.4	51.2	66.5
ii. Manu. and mining	12.8	13.8	14.2	8.1	4.4
iii. Trade	11.9	11.3	14.5	11.4	9.4
iv. Construction	6.4	6.5	4.4	10.1	4.3
v. Others	17.7	16.9	19.5	19.2	15.4

* The Population of (0.469 million) of FCA is included in Punjab.
^ The Population of (3.062 million) of FATA is included in NWFP.

1.4.1 LABOUR FORCE

According to the 1981 census, the country's labour force was 27.6 per cent of the total population and 40.2 per cent of the labour force was aged 10 years and above, of which 50.6 per cent were males and 2.1 per cent females.

The unemployment rate was, however, 3.1 per cent, of which 2.3 per cent was in the rural areas and 5.2 per cent in urban areas (2.9 per cent for males and 7.5 for females). Nearly half of the labour force is employed in agriculture, including animal husbandry, fisheries, forestry and hunting; 25 per cent in production and related works; 8.3 per cent in sales etc; and 3 to 4 per cent in professional, technical and related trades and professions including clerical jobs, services etc.

1.5 ECONOMY

Since 1947, when Pakistan gained independence and inherited a very weak economy, considerable progress has been made both in terms of growth in GNP and structural change in the composition of output. Development of social services and the programs for introducing modernisation of rural life have lagged behind improvements in physical output, but these concerns have moved up high on the agenda in recent years. Saving and investment rates, while improving steadily over the years, have remained below the full potential generated by growth in the economy. High dependence on foreign concessional loans and grants, providing a push to the development effort during the sixties, has been brought down to a small per centage of the GNP without recourse to large commercial borrowing. Inflation, threatening to get out of control during the mid-seventies, has been brought down to a single-digit rate.

The flow of goods and services from economic activities within the country-gross domestic product – has expanded almost five-fold in real terms; and per capita income, the most commonly used criterion of the stage of development and rate of progress, had more than doubled from less than Rs.1,800 at today's prices in 1950 to the level of about Rs.4,000 in 1982-83. The average growth rate for the period 1950 to 1983 has been 5.1 per cent per annum. The per capita income growth was about half of this rate. as a result of the relentless Tableincrease in the pressure of population.

TABLE 4

SOME ECONOMIC INDICATORS	PAKISTAN
- Per capita income US$	380
- Inflation rate (%) (Annual average 1980-89)	6.7
- Yield per hectare (Kgs) Wheat	1843
Rice (paddy)	2380
Seed Cotton	2283
Sugarcane	40720

TABLE 5 NATIONAL ACCOUNTS 1991-92
(Rupees Million)

Description	Constant factor cost Value	Share (%)	Current factor cost Value	Share (%)
Agriculture	121992	257	268103	254
Manufacturing and Mining	87728	185	192848	183
Wholesale and Retail Trade	79085	167	177335	166
Public Admn. and Defence	32246	68	84818	81
Transport, Storage and Comu.	45315	95	94161	89
Services	36335	76	80111	76
Other Sectors	72204	152	157455	149
GROSS DOMESTIC PRODUCT	474905	1000	1054831	1000
Net National from abroad	9125		23046	
GROSS NATIONAL PRODUCT	484030		1077877	
Per Capita Income (Rupees)	4126		9188	

TABLE 6 EDUCATION 1991-92

Particular	No. of Institutions	Enrolment (000 Nos.)	Teaching Staff (000 Nos.)
Primary schools	119892	12721	283
Middle schools	8914	3186	89
Secondary schools	8910	1220	168
Secondary vocational institutions	1151	135	10
Arts and science colleges	643	527	18
Professional colleges	99	79	5
Universities	23	82	5

1.5.1 THE INDUSTRIAL SECTOR

Despite difficulties, over the last four decades we have come a long way and the industrial sector, including large and small scale manufacturing, now contributes 20 per cent to the Gross Domestic Product with manufactured items accounting for 55 per cent of the total exports and employing 13.4 per cent of total employed labour force in the country.

Large scale manufacturing currently accounts for 70 per cent of the total industrial value added in the country. A considerable diversification has also been achieved in its structure. The share of the textile industry which was roughly 32 per cent of the industrial value added in the late sixties has now come down to 16 per cent with the growth of metal based industries and chemicals including fertilizer and petroleum refining and steel and steel-based industries.

There are about 66,000 units in Pakistan engaged in industrial production. Among these about 6,300 units are registered under the Factory Act, while the remaining units are small and of household level, mainly unregistered but contributing to the national economy. The engineering units registered in Pakistan have been estimated at 1,900 in number, with an estimated production of worth Rs.16 million. The manpower employed in this sector is estimated to be about 205,000 persons. Although the base of the engineering industry in Pakistan has been developed to a sufficient extent, the country still depends heavily on imported equipment and technologies to meet its requirements. The demand of engineering goods in Pakistan is around Rs.50.42 billion, comprising imports of about Rs.34.37 billion in the year 1985-86, which consumed about 70 per cent of total export-earnings of Pakistan. It has been estimated that the demand will increase from Rs.92.16 billion during the Seventh Five-Year Plan (1988-92) with a communicative annual rate of 10 per cent.

The expansion of the industrial sector is now faced with a different set of problems. These problems are offshoots of the high-tech age we live in. The world is undergoing today an unprecedented and revolutionary technological advancement and change. Every day large numbers of new products and processes appear in the market from the R&D laboratories. Technology is feeding on itself. This situation demands concerted corporate efforts towards technology management in industry. This requires a systems approach to manpower development in various technical fields.

TABLE 7 MANUFACTURING MINING AND ENERGY
(000 tones)

ITEMS	PAKISTAN	PUNJAB	SINDH	NWFP	BALOCHISTAN
Cotton yarn 1990-91	1041	613	377	-	-
Cotton cloth 1990-91 (million sq meters)	293	153	133	-	-
Sugar 1991-92	2326	1012	1188	126	-
Vegetable products 1990-91	656	-	-	-	-
Fertilizer 1991-92 (000 n-tones)	1151	714	384	53	-
Tractors 1991-92 (000 nos)*	11	-	-	-	-
Crude petroleum 1990-91 (Million Barrels)	23.486	10.902	12.584	-	-
Natural gas 1990-91 (Billion-cu-meters)	530.377	36.229	188.998	-	305.150
Electricity generation 1990-91 (Mn. Kwh)	41.694	10.432	18.583	12.385	294
Villages electrified as on 30.06.1991 (Nos.)	37295	18742	7895	8725	1933

2. TECHNICAL, EDUCATIONAL AND VOCATIONAL TRAINING (TEVT) IN PAKISTAN

When Pakistan came into being in 1947, it inherited an inadequate system of TEVT for industrial development. There were only two engineering colleges and few vocational institutes but no Polytechnic for producing technicians to fill in the communication gap between engineers and skilled workers. It cannot be denied that for the development of industry an engineering team is needed, comprising semi-skilled and skilled workers, technicians and engineers, therefore, technician education was given due importance in the TEVT System in the country.

In the latter part of the fifties therefore, two polytechnics and a Pakistan Swedish Institute of Technology started functioning. Later on more polytechnics and technical training college , commercial institutes, vocational institutes were established. Now there is a reasonable network of polytechnics, Government Vocational Institutes (GVIs), Apprenticeship Training Centres (ATCs) Technical High Schools, Commercial Institutes and Engineering Colleges throughout the country. But the output of all institutions, even today, make only a minority of the total work force.

With the advent of new technological age, basic skills will not serve the purpose. Industry requires new workers trained on the different types of latest equipment and machines which demand various types of skills.

Keeping in view the technological changes and to keep pace with the policies and priorities of the Government of Pakistan, the Ministry of Education is making concerted efforts to restructure the TEVT system in the country.

2.1 THE TEVT SYSTEM

- In structural terms, TEVT consists of three sectors namely, formal, informal and non-formal. The formal TEVT sector, relates to training under the control of the Ministry of Education (MOE) and the provincial Directorates of Technical Education (DTEs). The non-formal TEVT sector covers training provided outside the formal education sector, under the control of other government bodies, such as the Ministry of Labour, the Directorates of Manpower and Training, and the Departments of Social Welfare. The informal (Private) TEVT sector, consists of private TEVT institutions. Another traditional method of training is tutor and pupil (Ustad and Shagird) method of training which is generally undertaken by the low income group of society. Shagirds are learners mostly of the 6-10 age group entering into learning and they are paid nominal wages or almost no wages and learn the skill within a period of 4 to 8 years.

- The formal sector of TEVT includes vocational training in secondary schools; technician training in polytechnics and colleges of technology; commercial training in commercial institutes and colleges; and relatively limited training of skilled and semi- skilled workers in vocational institutes.

- The non-formal sector controls training for skilled and semi-skilled labour, in vocational institutes and technical training centres. Some training of commerce also occurs.

2.2 THE DEVELOPMENT OF TEVT

- On the recommendation of the First Education Conference in 1947 the Council of Technical Education which was established in 1948 prepared a comprehensive development plan including strategies for the training of technicians, entrepreneurs and skilled and semi-skilled workers in 1950. It recommended the establishment of the first three polytechnics by 1955.

- Establishment of the first three polytechnics occurred during the First Five Year Plan (FYP) period with the Ford Foundation's assistance.

- Directorates and Boards of Technical Education and Technical Teacher Training Wings within polytechnics were established in 1959 on the recommendations of the commission on National Education in 1959.

- Targets for significant improvement and expansion of vocation training were detailed in the Second Five-Year Plan (1960–1965) but were only 40 per cent attained. The major policy for the promotion and regulation of apprenticeship training was developed during this period and formalised in the Apprenticeship Ordinance, 1962.

- During the Third Five Year Plan (1965–1970) vocational schools were transferred from the Industries Department to Education for their improvement and expansion, and new centres were established.

- A new education policy was introduced in 1970. It described the condition of vocational training as "presently, there is no systemic pattern of training. Some training is conducted in the public corporations, a bit is done in private industry through apprenticeship programmes, vocational institutes exist here and there, but generally there is small enrolment. The scattered nature of training and the indefiniteness of its contents impede work mobility, hinder recruitment of talented people to operational tasks, and in general reduce productivity". (New Education Policy, Islamabad, 1970.)

- At the end of the Third FYP. Nine of the proposed 14 new polytechnics were established. Proposals to transfer commercial institutions into departments of polytechnics were not pursued.

- Nationalisation of private education institutions was implemented in 1972 in pursuance of the Education Policy, 1972–1980. The nationalization placed restraints on TEVT budgets. Following the reversal of the nationalisation policy in 1979, response in the form of investment in new private TEVT institutions has been markedly slow-except in commerce.

- The Education Policy, 1972-1980, introduced an agro-technical scheme for secondary education to widen the essentially academic curriculum of the schools and as a measure to increase the employability of school leavers. During (1970–1978) seven polytechnics were upgraded, and six new polytechnics and 27 commerce institutes were established. A major revision of the polytechnic curriculum was carried out.

- Major quantitative expansion of vocational training occurred during the late 1960s to early 1980s largely outside the formal system in response to the overseas labour boom and shortages of skilled labour in Pakistan.

- The National Education Policy, 1979, proposed the expansion of the agro-technical scheme and the orientation of curricula in the polytechnics vocational and commercial institutes to production. It also proposed the introduction of evening programmes, establishment of separate skills development schools for drop-outs and the commencement of a national technical teachers training college. Most of the proposals could not be implemented during the Fifth Five-Year Plan (1978–1983).

- On the recommendations of the ILO and IDA the National Training Board (NTB) was organised as a statutory Vocational Training body, the National Training Bureau and the Provincial Training Boards, (PTB) to regulate and promote vocational training and assess existing and future training needs for both local and foreign labour markets.

- Major expansion and development of vocational training facilities took place through the World Bank financed National Vocational Training Project, (NVTP) Phase-I (1981–1987).

- Expansion and upgrading of the polytechnics, including the establishment of the first polytechnics for women, occurred during the Sixth Five-Year Plan period through Asian Development Bank funding. The National Technical Teachers' Training College was established under the same project.

- The Seventh Five-Year Plan (1988–1993) included major proposals for the improvement and expansion of TEVT, increasing total enrolments by over 33 per cent. Thirty-six new poly/mono-technics and fours commerce colleges, the consolidation (not expansion) of existing commercial institutes and the upgrading of six commercial institutes to colleges, were proposed. The introduction of new technologies in the polytechnics and the commencement of full operation for the National Technical Teachers' Training College, Islamabad was stressed. Further expansion of vocational training is proposed under Phase-II of the National Vocational Training project and by encouragement to the private sector by means of loans and tax incentives.

The major policy statements of the Seventh Five-Year Plan (FYP) proposed the provision of polytechnics at district level, for men, and division level for women, and of a college of technology in each division. The plan restated earlier proposals for legislation to enable industrial training for engineering and technical graduates and for the establishment of production units in selected Technical and Vocational Institutions. It reaffirmed the Sixth FYP proposal for a Council of Technical and Vocational Education for the planning, coordination and evaluation of the entire range of technical and vocational programs.

TABLE 8

PAKISTAN
MAJOR COMPONENTS OF TEVT
NUMBER OF INSTITUTIONS AND ENROLMENTS

	No. of Institutions	Enrolment (rounded)
FORMAL SECTOR		
-Directorates of Technical Education Polytechnics/Colleges of Technology (Diploma of Associate Engineer)	52	28000
-Commerce (Certificate and Diploma of Commerce).	137	22000
Vocational Institutes/Centres, Boy	20	3800
Vocational Institutes, Women	185	8700
NON-FORMAL SECTOR		
-Directorates of Manpower and Training Technical Training Centres/Vocational Institutes	74	10600
-Social Welfare Directorates of Social Welfare	2052	62000
Department of Rural Development and Local Government, NWFP	415	6200
-Small Industries Corporations	306	9500
-Agriculture		
Agency for Barani Areas Development, Punjab	42	2400
Directorate General of Agriculture, Punjab	7	500
Directorate of Agricultural Engineering	4	170
Institute of Cooperative Agriculture, Punjab	1	100
-Industries		
Directorate of Industries and Commerce, NWFP	3	90
Directorate of Industries and Mineral Development, Punjab	2	150
ILO-UNCHR	12	640
-Overseas Pakistani Foundation	6	400
INFORMAL SECTOR	Comparable data not available	

2.3 THE EDUCATION SYSTEM

The formal education system consists of five years of primary education (class I-V), five years of secondary education (classes VI-X), two years of higher secondary education/intermediate education (classes XI-XII) and two years of tertiary education. Secondary education is subdivided into middle school (classes VI-VIII) and high school or secondary level (classes IX-X). The intermediate college is a higher secondary education program. This is usually offered in usually a degree (B.A./B.Sc.) level institution which is two years beyond classes XII. Universities also offer post degree and research programs.

The literacy rate is 26 per cent, among the lowest in the world. The participation rate at the primary level is 64 per cent. It is 30 per cent for females and in the rural areas is much below the national average. The dropout rate at the primary level is estimated at 50 per cent. In rural Baluchistan, it is 93 per cent for girls. At the secondary education level, the dropout rate is around 50 per cent.

Some of the those leaving primary schools (5-years schooling) prefer to join the workforce through the informal sector rather than continue their formal schooling. They develop some skills competency in vocational trades through the "Ustad-Shagrid" System (an internal apprenticeship program). In order to develop National Training Vocational Competency in some of the trades, some of those leaving middle schools (after eight years schooling), join vocational training institutes or centres and, after one or two years training, qualify for certificates in vocational trades as semi-skilled and skilled workers. They form the bulk of the skilled labour workforce.

After High School (ten years of schooling), the following three major options are available to those who want to pursue further education:

- entry into an intermediate college for a 2 year course leading to award of FA or FSc qualification. This is a higher secondary school certificate which forms the basis for entry into higher general, as well as, professional courses leading to bachelor degrees in Engineering, and Architecture, Medicine, Agriculture, Law, Education, Sciences etc.
- entry into a polytechnic (three-year programme), to earn a Diploma of Associate Engineers (DAE), (the Graduates are called "technicians"). Holders of DAE qualification get the sub-professional/ supervisory job, in industry or entry into a College of Technology for a 2 year course of B.Tech and a further 2 year course leading to the award of BTech (Hons) degree. The BTech (Hons) are known as "technologists". A very limited number of polytechnic graduates are able to join Engineering Colleges/Universities, to undertake a four-year degree course in Engineering.
- entry into apprenticeship training centres attached to industry to undertake two to four-year sandwich programs to qualify as a skilled worker in a vocational trade.

2.4 ADMINISTRATION OF EDUCATION

According to the constitution of Pakistan, the general policy panning and overall guidelines (including curricula, textbooks and standards of education) are the responsibility of the Federal Government, whereas implementation of the policy, programmes and projects rest with the provincial governments. The Ministry of Education (MOE) at the federal level is responsible for curricula for all types of education including TEVT. In the public sector the Directorates of Technical Education (DTE), Provincial Directorates of Manpower Training and some other agencies for the public sector run their own vocational training programmes. The NTB and the PTBs are to hold their examinations and issue certificates. Industry has its own training programs for training middle level and semi-skilled workforce.

2.4.1 FEDERAL GOVERNMENT

The Ministry of Education (MOE) is headed by the Federal Minister for Education. It is administered by the Secretary of Education who is assisted by several Joint Education Advisers who deal with administration, planning and development, primary and non-formal education, institutions, curriculum, secondary and technical education, sports and welfare and international cooperation. There are more than sixty autonomous bodies and attached departments of MOE which deal with a variety of matters. The University Grants Commission (UGC) is responsible for tertiary education. The Secondary and Technical Education (S & TE) Wing of the MOE is responsible for the development of secondary and technical education and vocational training within the formal education system. There are also several professional bodies such as the Institute for the Promotion of Science Education and Training, the National Education Equipment Centre and the National Museum of Science and Technology. The National Technical Teachers Training College has been established to develop TEVT inputs and the training of technical teachers in collaboration with provincial Directorates of Technical Education.

2.4.2 PROVINCIAL GOVERNMENTS

At the provincial level, the formal education system is more complex since each of the four provinces has evolved a system of its own to meet special needs in response to local demographic, social and economic demands. The common feature in all four provinces is the Provincial Education Department (PED) which is responsible for implementing national policies and programs on education formulated by MOE.

At sub-provincial levels, there is a hierarchical administrative structure for the supervision of general education at divisional, district, subdivisional, tehsil, markaz and union council levels. There are variations to this pattern and staffing below the tehsil level, largely dependent on population densities and the availability of facilities.

2.4.3 VOCATIONAL TRAINING

Various TEVT institutions are managed by different organisations of the Government. Each institution has its own objectives and the training programs reflect a wide range of contents, structures, durations, entry qualification and modes of training. Training programs prepare for a variety of jobs in the labor market — from industrial to agricultural-related work, urban to rural, local to overseas employment, labour intensive to high-technology. Courses range from 4 months to 2 years for certificates issued by the Boards of Technical Education, the National Training Board or the training agency. Curricula, instructional methods, instructor competencies, physical facilities and equipment vary from institution to institution.

The Directorates of Technical Education also have administrative control over Government Vocational Institutes (GVIs) for boys except for those in Punjab and Baluchistan. The Directorate of Social Welfare and the Department of Rural Development and Local Government in NWFP provide courses mostly for women, mainly in tailoring/dressmaking, sewing, embroidery, knitting and handicrafts, of 3–6 months' and 1 or 2 years' duration. Educational qualification are not required for entry. Commercial training in typing, shorthand accountancy and secretarial work is also conducted ranging from 3–24 months' duration with matriculation as an entry requirement.

2.5 ORGANISATIONS AND STATISTICS ON TECHNICAL AND VOCATIONAL EDUCATION (1992)

The Federal Ministry of Education has the responsibility of policy formulation, while the provincial education departments are fully responsible for executing education plans. The Federal Ministry of Education through a number of administrating wings, coordinate the working, while provincial education departments through Directorate of Technical Education control the activities of Technical Education. Similarly Vocational Training is the responsibility of the Ministry of Labour and Manpower, although some other ministries also look after vocational training. The Ministry of Labour and Manpower have a Training Board and a Training Bureau which look after the affairs of Vocational Training. Provincial Departments of Labour control vocational training through the Directorate of Labour.

The organisational structures of Ministry of Education, Ministry of Labour and Manpower, Training Board and training Bureau, Provincial Education and Labour including:

- Enrolment, intake and output of education system including TEVT by level and by Gender.
- Number of Vocational Technical and Engineering Institutions in Pakistan.
- Intake capacity enrolment and output of Vocational Commercial and Technical Institutions.
- Annual intake capacity and enrolment by technology in Government Polytechnics/College of Technology.
- Number of Training Centres, their capacity enrolment and output per year.
- Capacities, enrolments and outputs of non-formal training system institutions are included in the Appendices.

2.6 EXISTING TRAINING PROGRAMS FOR WOMEN

The economic pressures in Pakistan which continue to push women into the national labour force are increasing day by day. Government therefore is giving due consideration to female skill training and technical education programs. New courses are being introduced in polytechnics and in vocational institutes. Similarly there are plans to introduce biotechnology in the Women Polytechnic Karachi and courses on dental hygiene and hair cutting under the Board of Technical Education Punjab.

The Government provides skill training to women through numerous line departments; Provincial Departments of Education, Labour and Manpower, Social Welfare, Rural Development and Local Government, and the Small Industries Corporations. Women's training which leads to a certificate or diploma is conducted by Departments of Education and Department of Labour and Manpower. Informal training programs, which are generally unstructured in organisation, use non-standardised curriculum, have no admission criteria and are flexible in scheduling, are conducted by such agencies as the Departments of Social Welfare, the Small Industries Corporations and Rural Development and Local Government. The Population Welfare Departments in line with their integrated approach to family planning, often provide non-formalised skill training to women at their Family Welfare Centres. Outside government provision, non-government organisations (NGOs) provide informal training to women in urban and rural areas. Leading NGOs like Behbood, Family Planning Association of Pakistan, Family Welfare Cooperation Society, Sindh rural Workers Cooperation Organisation etc. mainly conduct skill training courses in tailoring, embroidery work, handicrafts, food processing etc. Some have branched out to provide training in areas like shoe making, candle making, mushroom growing, etc. Training provided by the NGO sector caters mainly to the labour requirements of the informal home-based manufacturing sector.

2.7 GOVERNMENT TRAINING PROVISION FOR WOMEN

Training provided by the government can be broken down at two levels.

2.7.1 SECONDARY LEVEL

The scheme to vocationalise secondary level education was initiated in 1973–74 when the Ministry of Education first introduced the "Adro-Technical" scheme. Girls get training in home economics beginning in Class–VI.

2.7.2 POST-SECONDARY

Diploma and certificate courses offered by the Departments of Technical Education and Departments of Labour and Manpower fall under this category. Post-secondary level courses are offered at Government Vocational Institutes (GVIs), government vocational schools (GVSs), teachers training institutes (TTIs), Technical Training Centres (TTCs) and Government Commercial Training Institutes.

2.7.3 GOVERNMENT VOCATIONAL INSTITUTES (GVIS) AND SCHOOLS (GVSS)

These are administered by Provincial Boards of Technical Education. GVIs in Punjab and NWFP, and GVSs in Sindh offer one year courses in embroidery, hand and machine knitting, tailoring, dressmaking and food preservation, leading to a certificate. Two year courses in hand and machine knitting, tailoring and sewing, leather work and occasionally in typing leading to a diploma are also offered especially in city-based GVIs. Courses in cooking, hairdressing, shorthand and food preservation have also been introduced at GVIs. In Punjab there are 99 GVIs for girls. Sindh has 54 GVSs for women/girls that offer only certificdate courses and 5 GVIs that offer certificate and 2 year diploma courses. Approximately, 3,000 women/girls attend GVI/GVS courses annually in Sindh. Baluchistan has no GVI.

2.7.4 TEACHERS TRAINING INSTITUTES

There are two Technical Training Centres (TTCs) for girls/women in the country; in Punjab and in Sindh that operate under the Labour Department. The TTC in Sindh offers one year courses in electronics (Radio/TV), Civil/Architectural Drafting and repair of domestic appliances. In Lahore, a TTC has been set up in collaboration with GTZ as a "Pilot" Project and it has introduced non-traditional skill training for women.

2.7.5 TECHNICAL TRAINING CENTRES

There are two Technical Training Centres (TTCs) for girls/women in the country; in Punjab and in Sindh that operate under the Labour Department. The TTC in Sindh offers one year courses in electronics (Radio/TV), Civil/Architectural Drafting and repair of domestic appliances. In Lahore, a TTC has been set up in collaboration with GTZ as a "Pilot" project and it has introduced non-traditional skill training for women.

2.7.6 GOVERNMENT COMMERCIAL TRAINING INSTITUTES FOR WOMEN

There are 61 commercial training institutes administered by the Provincial Departments of Education. these institutes offer training courses in shorthand, typing, bookkeeping, business and English and the minimum qualification required for admission is matriculation.

2.7.7 POLYTECHNICS FOR WOMEN

There are fifteen polytechnics for women administered by the Provincial Directorates of Technical Education. However, out of these one at Islamabad is under the Ministry of Education.
These polytechnics offer diplomas and certificate courses in Computer, Radio, TV and Electronics, Garment Technology, Commerce, Secretarial Work and Architecture. Diploma courses in technology are of 3 years duration and commerce has two years courses; certificate courses in commerce are of 2 years duration.

They are following the same curricula as for other polytechnics and commercial institutes under the same examining bodies.

3. MEASURES TO IMPROVE QUALITY OF TEACHERS ANDINSTRUCTORS

3.1 TEACHERS IN TEVT

The teacher is a most important element in the education system. Resources are no doubt necessary, but human competencies and skills are more important to operate the system and to make optimal use of the resources. The potential of human resources cannot be underestimated. While other resources are subject to decay, deterioration and obsolescence on a time scale, it is possible to increase the potential and the contribution of human resources with time.

3.2 CATEGORIES OF TEACHERS

The ultimate quality of the delivery system of any curriculum depends, among other factors, on the qualifications of the teachers. On the basis of their specific teaching functions polytechnic teachers are broadly classified into three categories: those who teach technical theory courses; those who teach practical courses in workshops and laboratories, and those who teach related subjects of mathematics, science, and humanities included in the polytechnic curricula. Based on this classification of functions the sources of their supply also differ. Teachers who are required to teach technical theory are engineering degree holders or hold equivalent qualifications such as associate membership of the Institute of Engineers. For teaching workshop courses the prescribed qualification is a diploma from a polytechnic, or in some cases a certificate from a TTC with prescribed industrial experience. Postgraduate degrees in their respective field are required for the teachers of related studies.

In terms of the designations the teachers in polytechnic are categorised as:

TABLE 9

POST	PAY	FUNCTION
Principal	BPS-19	Administration of the Institution
Head of Department	BPS-18	Supervision of Department Teaching theory
Senior Instructor	BPS-17	Teaching theory
Instructor	BPS-17	Teaching workshop courses; Supervision of practical
Junior Instructor	BPS-16/14	Teaching workshop courses; Supervision of practical

The support staff consist of shop assistants, and administrative and clerical staff. The recruitment of teachers to various posts in the public sector institutions is governed by the relevant rules.

3.3 QUALITY OF TEACHERS

Over half the teachers in the polytechnic and colleges of technology have no higher basic qualifications, but have the same basic qualification, as the students they teach. Of these 32 per cent have industrial experience following their Diploma of Associate Engineer program. Overall, some 38 per cent of polytechnic teachers have DAE with no industrial experience as their basic preparation for teaching. This situation is far more common for female teachers in the women's polytechnic than for men. Excluding the commerce teachers in the women's polytechnic only 4 per cent of the female teachers sampled have industrial experience. For the men, separately, 58 per cent of those with DAE as their highest qualification have industrial experience, although this was often as short as three months. For the entire teacher group, 55 per cent have industrial experience with an average length of just over four years. For the men separately, 67 per cent have industrial experience.

Over half the polytechnic teacher group, have some professional teacher training (54 per cent), but most commonly for only three months or less. Overall 35 per cent of the teachers had received some subject upgrading during their teaching careers, albeit for as little as four days. The incidence of professional teacher training seemed to be higher for older than younger teachers.

As a group very few commerce teachers could be regarded as appropriately prepared and trained for teaching the main programs of the schools. Most are overqualified in academic terms for the programs being taught - 53 per cent have masters level degrees, 9 per cent double masters. Only 24 per cent have any industrial/ commercial experience and 23 per cent any professional training for teaching, and then, most commonly, very brief vacation programs. Eleven per cent had undertaken some content upgrading during their teaching careers, again generally in very brief programs.

The profile of teachers in GVIWs demonstrates their remarkable but not unexpected uniformity of background and training for teaching. All have matriculation, a two year diploma from a GVI, that is the institutions in which they are now teaching, and have completed a one year vocational teacher training program specifically for GVI teaching. None have industrial experience although some have previous teaching experience either as part-time teachers in GVI evening programmes (generally under Women's Division support) or in Social Welfare training centres.

A significant proportion of instructors in the technical training centres and other institutions under the national and provincial training boards, have basic qualifications inappropriate to the objectives of the programmes being taught. Overall some 24 per cent of instructors have a Diploma of Associate Engineer or degree level qualifications without basic trade training. Most instructors (64 per cent) have basic trade certificate training, only 3 per cent of the total group having advanced trade training. The majority of all instructors however (98 per cent) have industrial experience. Over half of all instructors (52 per cent) have instructor training 31 per cent in a full one year program. Apart from that included in instructor training programs, only 6 per cent of instructors had undertaken content upgrading since commencing teaching.

3.4 TRAINING OF TEACHERS

Immediately after the establishment of the first polytechnic the Government established two teacher training wings at Karachi and Rawalpindi Polytechnic (the Karachi wing is no longer functioning and the latter has since been shifted to Government College of Technology, Lahore). Later a Teacher Training Wing (TT Wing) was also established in the GCT at Peshawar. The purpose of these wings was to provide inservice training to the teachers, for which certificate and diploma courses in teacher education were designed. These courses included pedagogical content and also subject updating. The functioning of these wings were hampered because they had no independent entity, depending for their share of staff and physical facilities on the polytechnic where they were located. Since these institutes are already over strained due to excess enrollments, little could be done to accommodate the needs of technical teacher training. Yet these wings have made valuable inputs to the development of the faculty for the institutes. The shortage of teachers

available for training is another constraints in the functioning o the Teacher Training Wings. Teachers could not be spared for full time Diploma/Certificates courses in teacher education. The MOE has established a National Technical Teachers Training College (NTTTC) in Islamabad under a credit from the ADB. The College has a comprehensive character which includes teacher training and staff development, providing educational services in the form of teaching learning resources, and undertaking research and assisting the Government in the planning and management of technical education programs.

It is considered that matters related to the preparation and conditions of service for polytechnic teachers in Pakistan leave much to be desired some of the issues which need attention are:

- There is no arrangement for the induction of new teachers into their jobs;
- The teaching/learning process is operated without any guidelines for the new entrants to the teaching profession;
- A chronic shortage of teachers who can be released for training appears to be a limiting factor in the provision of a centralised teacher training facility;
- The roles of NTTTC and the provincial Teacher Training Wings need to be properly defined to make optimum use of resources and staff;

TABLE 10

TEACHERS IN GOVERNMENT POLYTECHNIC INSTITUTES
AND COLLEGES OF TECHNOLOGY
PROFESSIONAL PROFILE
30 MAY 1989

		PER CENT	PER CENT
1.	BASIC QUALIFICATIONS/TRAINING		
1.1	Diploma of Associate Engineer	55	
1.2	Diploma of Associate Engineer Plus BA/MA	7	
1.3	Diploma of Associate Engineer Plus B. Eng/B. Sc.	6	
1.4	Bachelor of Technology Bachelor of Science Eng Bachelor of Science	17	
1.5	Master of Science Eng Master of Science Master of Arts	15	100
2.	INDUSTRIAL EXPERIENCE		
2.1	With industrial experience	55	
2.2	Without industrial experience	45	100
	Average length: 4.12 years		
3.	TEACHER TRAINING		
3.1	No Teacher Training	46	
3.2	Teacher Training by Length 3 months or less 26 per cent 6 months 3 per cent 1 year 25 per cent	54	100
4.	OVERSEAS FELLOWSHIP TRAINING At any stage during teaching	13	
5.	UPGRADING PROGRAMMES At any stage during teaching	35	

TABLE 11

TEACHERS IN GOVERNMENT COLLEGES OF COMMERCE
COMMERCIAL TRAINING INSTITUTES AND COMMERCIAL TRAINING CENTRES
DIRECTORATES OF TECHNICAL EDUCATION

PROFESSIONAL PROFILE
30 MAY 1989

		PER CENT	PER CENT
1.	BASIC QUALIFICATIONS/TRAINING		
1.1	Diploma of Commerce	9	
1.2	Bachelor of Commerce	12	
1.3	Diploma plus Bachelor of Commerce	5	
1.4	Diploma plus Master of Commerce	12	
1.5	Master of Commerce/MA Econ	53	
1.6	Double Masters	9	100
2.	INDUSTRIAL EXPERIENCE		
2.1	With industrial experience	24	
2.2	Without industrial experience	76	100
	Average length: 4.80 years		
3.	TEACHER TRAINING		
3.1	No Teacher Training	77	
3.2	Teacher Training by Length		
	3 months or less 14 per cent		
	B Ed/MBE 09 per cent	23	100
4.	OVERSEAS FELLOWSHIP TRAINING		
	At any stage during teaching	Nil	
5.	UPGRADING PROGRAMMES		
	At any stage during teaching	11	

TABLE 12

TEACHERS IN GOVERNMENT VOCATIONAL INSTITUTES, WOMEN
DIRECTORATE OF TECHNICAL EDUCATION
PROFESSIONAL PROFILE
30 MAY 1989

		PER CENT	PER CENT
1.	BASIC QUALIFICATIONS/TRAINING		
	1.1 Diploma Vocational Education (GVI)	100	100
2.	INDUSTRIAL EXPERIENCE		
	With industrial experience	Nil	
3.	TEACHER TRAINING		
	3.1 Certificate/Diploma, Vocational Teacher Training (1 year)	100	100
4.	OVERSEAS FELLOWSHIP TRAINING		
	At any stage during teaching	Nil	
5.	UPGRADING PROGRAMMES		
	At any stage during teaching	Nil	

TABLE 13

INSTRUCTORS VOCATIONAL TRAINING INSTITUTIONS
NATIONAL TRAINING BOARD/PROVINCIAL TRAINING BOARDS

PROFESSIONAL PROFILE
30 MAY 1989

		PER CENT	PER CENT
1.	BASIC QUALIFICATIONS/TRAINING		
1.1	Trade Certificate	64	
1.2	Trade Certificate plus Advanced Trade Training	3	
1.3	Trade Certificate plus FA/BA	5	
1.4	Diploma of Associate Engineer	23	
1.5	Trade Certificate plus Bachelor of Technology	3	
1.6	Bachelor of Engineering Bachelor of Science Bachelor of Science	2	100
2.	INDUSTRIAL EXPERIENCE		
2.1	With industrial experience	98	
2.2	Without industrial experience	2	100
	Average length of Industrial experience Certificate holders: 6.25 years Diploma holders and Others: 4.90 years		
3.	INSTRUCTOR TRAINING		
3.1	No Instructor Training	48	
	6 months 21 per cent 1 year 31 per cent	52	100
4.	OVERSEAS FELLOWSHIP TRAINING At any stage during teaching	3	
5.	UPGRADING PROGRAMMES At any stage during teaching	6	

- There is a critical shortage of senior instructors;
- Promotion of teachers from lower to higher posts is without any consideration of the enhanced level of teaching to be performed in the new post;
- A system of pre-service education as a future source of teachers needs to be explored.

There are currently six provincial TEVT teacher/instructor training "centres" and two national centres in Pakistan. The provincial Directorates of Technical Education conduct two Technical Teacher Training Wings, one in Lahore and one in Peshawar. Small training wing for commerce teacher programs is attached to a commercial training institute in Lahore. The provincial directorates, Sind and the Punjab each

administer a Vocational Teachers Training Institute for Women. The National Technical Teachers Training College, Islamabad is administered through the Ministry of Education.

Instructor training for the vocational institutes (DMT) is currently provided mainly through the Staff Training Institutes, Lahore, and the Department of Manpower and Training, Government of the Punjab. An increasing number of instructors through the National Staff Training Institute, Islamabad, National Training Board (Manpower Division) are being trained.

The Government Technical Teacher Training College, Faisalabad is under the administration of the Directorate of Technical Education, Government of the Punjab. Its function is the training of teachers for the general education (Agro-Technical and Industrial Arts) secondary schools, not for TEVT.

The Technical Teachers Training Wing, Karachi ceased operation in early 1988 following an alleged student seizure of its building.

A small number of teachers in TEVT have teacher training qualifications from the general teachers colleges or universities. The Master of Business Education, which is accepted as a masters level commerce qualification for appointment in DTE, Punjab, contains some specialist teacher training elements.

3.5 TRAINING REQUIREMENTS

Polytechnic and college of technology teachers (DTE) do not require professional teacher training for appointment at Junior Instructor level. For initial appointment at Instructor or Senior Instructor Levels applicants with teacher training are given "preference". For promotion to Instructor and Senior Instructor positions the Junior Instructor requires a Technical Teachers Diploma. In practice this is not always enforced because of the difficulties of releasing teachers for training.

Teachers in the commercial institutes and colleges (DTEs) do not require teacher training for either initial appointment or promotion. No preference in appointment or promotion is given for teacher training.

Diploma holders from GVIWs may be appointed as Shop Assistants (BPS-6) without teacher training. In practice most have teacher training. Appointments at higher levels, or promotion from Shop Assistant to higher levels, requires the Diploma/Certificate of a Vocational Teachers Training College for Women.

Initial appointment to the vocational training institutes (DMT) does not require instructor training. Promotion beyond initial appointment level, at all stages, requires the Instructor Training Certificate/ Diploma. Exceptions to this appear to occur in practice.

3.6 FUNCTIONING OF TEACHER TRAINING INSTITUTIONS

An overview of the functioning of some renowned institutions working for quality improvement of teacher is presented in the next few pages.

3.6.1 TECHNICAL TEACHERS TRAINING WING, LAHORE DIRECTORATE OF TECHNICAL EDUCATION, PUNJAB

The Technical Teacher Training Wing, Lahore, is located at the Government College of Technology, Lahore. It was transferred there from Rawalpindi in 1984. The Wing is headed by a Head Teacher Trainer (BPS-18) responsible to the Director, Technical Education.

The function of the Wing is the provision of content upgrading/extension and pedagogy training to polytechnic teachers, including teachers from the women's polytechnic. Teachers are released on full pay for a full year continuously. Because of the link of the requirement for teacher training with promotion, teacher interest in undertaking training depends on promotion vacancies in particular areas. Release of teachers, particularly in some specialist teaching areas, has in recent years been difficult because of shortages. Together these have led to relatively small intakes, of varying size.

The total trainee enrolment of the wing, 1988–89 was 40; planned enrolment, 1989–90; 60. These enrolments include trainees undertaking the program in one year and those on part-time release who undertake the program components over an extended period.

The full program leads to the award of the Diploma in Technical Education of the Board of Technical Education, Punjab. Examinations are conducted by the Wing.

The curriculum is that originally developed under Ford Foundation technical assistance in 1959. Modifications have recently been incorporated in line with the recommendations of the First National Workshop and Conference, Technical Teacher Education for Polytechnic Teachers, 1983, and the resultant so-called "CPSC curriculum". The program currently comprises:

- Introduction to polytechnic education
- Education psychology
- Professional Ethics
- Workshop organization and management
- Testing and grading
- Methods of teaching
- Course planning
- Preparation of instructional materials
- Practice/teaching I
- Math I, II
- Physics
- Applied mechanics
- Advanced courses (individual specializations)
- Industrial training

Overall the programme comprises some 50 per cent pedagogy, and 50 per cent content upgrading, and advanced technology training. The Wing had a total sanctioned permanent staff of six, including the Head Teacher Trainer. Additional part-time staff are used on release from the polytechnic, particularly for specialist teacher supervision of Teaching Practice.

The permanent staff group all have extensive polytechnic teaching experience, and all hold basic diplomas or degrees in their specialist polytechnic teaching area. All have teacher training from a Technical Teachers Training Wing. Some of the staff have further (graduate) qualifications in education.

3.6.2 GOVERNMENT VOCATIONAL TEACHERS TRAINING INSTITUTE FOR WOMEN, LAHORE

The Government Vocational Teachers Training Institute for Women, Lahore, is an old established institution and a pioneer institution in teacher training for women. The institute occupies excellent buildings in Lahore, on a site shared with the GVIW, Dev SMAJ Road. The institute is headed by a Principal (BPS-18) responsible to the Deputy Directoress, Directorate of Technical Education.

The function of the institute is primarily to train teachers for the Government Vocational Institutes for Women, mainly for the Punjab, although students from other provinces have been enrolled in the past.

Although a small number of teachers are currently enrolled on an "inservice" basis, the major enrolment is of diploma holders from the GVIs. (Admission requirement is matriculation (Class XI plus GVIW Diploma). It thus offers pre-service training for employment as GVI teachers.

Thus, in total, some 40 per cent, maximum, may expect to find teaching employment. Others may obtain limited part-time evening class teaching. Others may obtain a teaching position in the future. For the majority, however the programme effectively becomes a third year GVI programme in needle and craft skills for the home, or possibly for home based earning. this is clearly reflected in the programmes offered in the institute and in its teaching approaches. Professional teacher training has only a marginal place in its programmes.

The program is of one academic year (9 months) and carries the award of Diploma of Vocational Teacher Training (Board of Technical Education). The medium of instruction is Urdu. The average trainee fail rate is under 5 per cent.

The program currently comprises three major subject groups:

Compulsory (I) Core Studies	-	Tailoring and dressmaking Painting and drawing
Compulsory (II) Methodology and Islamiat	-	Practice of teaching, office work Office work Islamiat/Pakistan studies
Elective (one of)	-	Needlework, fancy woodwork, leather work, fabric printing, hand and machine knitting

Basically the majority of the program involves advanced GVIW work with perhaps a slightly wider range of craft options, and a greater design emphasis. Approximately 90 per cent of the total programme is devoted to craft skill development.

The syllabus documentation of the institute outlines the methodology (professional teacher training) components of the program. This comprises some 10 per cent of the total program.

The institute has a teaching staff of 40, closely matching the staffing of a GVIW. According to the Director of Technical Education, Punjab, staff for the institute are selected on the basis of their academic records, teaching experience and administrative ability. Excluding the principal and vice-principal, the staff presented a similar uniformity of background and experience to that found in a GVIW. All had teacher training from the institute in which they were now teaching; all had a GVIW diploma. None had industrial experience, although some 25 per cent of the group had taught outside the GVIW system. Over half the group had qualifications other than GVIW and teacher training, most commonly FA.

3.6.3. STAFF TRAINING INSTITUTE, DEPARTMENT OF LABOUR MANPOWER AND TRAINING, PUNJAB

The Staff Training Institute, Lahore is located on the same campus as the Technical Training Centre, Gulberg and the facilities and training groups of the TTC are used for institute programmes and teaching practice. The institute is headed by a Director, (BPS-18) responsible to the Director, Department of Manpower and Training. Technical assistance to the institute is provided through GTZ.

The institute commenced operation in 1968 training vocational instructors from four trade areas in short instructor training programs. The institute has an enrolment (1989/90) of 60 instructors from relevant trade areas undertaking a one year Instructor training certificate program. Some of these are instructors from other provinces undertaking the program at Gulberg through arrangement with NSTI. More than 420 instructors have now undertaken instructor training at the institute, some 75 per cent of them from the Punjab.

The instructor training program comprises skills upgrading (theory and practical) and instructional skills. Program design shows a 60/40 break between skills upgrading and instructional skills development. In practice however, the program appears to be somewhat more heavily weighted (perhaps 75 per cent) to skills upgrading.

The instructional techniques components of the program focus on the instructors' ultimate ability to be able to prepare for instruction in student learning terms: planning, preparation and the evaluation of student performance. Micro teaching techniques are used for basic teaching skills development before supervised teaching experience is undertaken.

Overall there is an observable commitment to the integration of skills upgrading and instructional skills development in the actual processes of training. A team teaching process of a generalist pedagogy instructor with the specialist trade master instructor is being used for trade skills sessions for example.

The institute appears to be well equipped with current educational hardware. Teaching and support materials were in evidence and seemed to be being used systematically and appropriately.

Master Instructor staff recruitment is, in the main, from amongst the staff of the TTCs, generally those with further trade or technician level qualifications. Intern training and staff development is conducted for master instructors, generally with overseas advisor assistance. A significant program of overseas fellowship training, through tailor-made special programs to meet defined individual master trainer needs, is conducted as part of the project assistance.

Teacher training for teachers of technical/vocational subjects at Classes VI to VIII and IX to X levels is currently offered in a number of both specialist and general teacher training institutions. Both pre-service and inservice programs occur. Specialist institutions include in particular the Agro-technical Teachers Training Centres (at Hyderabad, Peshawar, Gakkar, Quetta, Muzaffarabad and Islamabad) and the Government Technical Teachers Training College, Faisalabad. Specialist programmes, as distinct from method studies, are also offered in some general teacher training institutions — the MA Technical Education Program in industrial arts of the Institute of Education and Research, University of the Punjab, for example.

3.6.4 TEACHER TRAINING FOR TECHNICAL AND VOCATIONAL SUBJECTS IN SECONDARY SCHOOLS

Teacher training for teachers of technical/vocational subjects at secondary classes VI to VIII and IX to X levels is currently offered in a number of both specialist and general teacher training institutions. Both pre-service and inservice programs occur. Specialist institutions include in particular the Agro-technical Teacher Training Centres (at Hyderabad, Peshawar, Gakkar, Quetta, Muzaffarabad and Islamabad) and the Government Technical Teachers Training College, Faisalabad. Specialist programs, as distinct from method studies, are also offered in some general teacher training institutions — the MA Technical Education program in industrial arts of the Institute of Education and Research, University of the Punjab, for example.

In general terms the specialist institutions, and the specialist programmes within general institutions, are ill housed, ill equipped and often lack appropriate specialist staff. All consistently lack materials for practical work and teaching and support materials.

3.6.5 NATIONAL TECHNICAL TEACHERS TRAINING COLLEGE, (NTTTC), ISLAMABAD, MINISTRY OF EDUCATION

The National Technical Teachers Training College, Islamabad, was established in 1982 under the Asian Development Bank Technical Teacher Training and Polytechnic Project. It became operational in 1987 and commenced its first long term training programme in June 1989.

Original planning for the NTTTC (1981) included the provision of pre-service and inservice courses for post-secondary and secondary technical school teachers: master teacher training programs for agro-technical teacher trainers, short courses for teachers and training programs for technical education management and supervisory staff. It was also envisaged that the NTTTC would operate as the audio-visual aids centre for technical education in Pakistan.

The scope of planned activity of the NTTTC was subsequently reviewed and modified, effectively limiting its major training functions to the inservice upgrading and teacher training of polytechnic teachers.

NTTTC is now functioning as an designated autonomous body of the Ministry of Education under the Board of Governors chaired by the Federal Education Secretary.

3.7 PRESENT STATUS OF TEACHER TRAINING

3.7.1 TECHNICAL AND COMMERCIAL INSTITUTIONS UNDER PROVINCIAL DIRECTO RATES OF TECHNICAL EDUCATION

In order to determine the Teacher Training need of polytechnic/colleges of technology and commercial training institute/commerce colleges under provincial departments of technical education, a performa was sent to all institutions. The Provincial Directorate of Technical Education were also requested to direct principals to supply us relevant data. Some institutions supplied the data. The data from the province of Punjab was obtained from the Regional Directors on telephone. The data available upto now represents the following picture.

Up-to-date Statistics

Provincial Position:

S.NO	REGIONS	FILLED	NO. OF TRAINED PERSONNEL	NO. OF UNTRAINED PERSONNEL	% OF UNTRAINED
1.	Multan	2723	571	849	64%
2.	Rawalpindi	1320	92	1228	93%
	Total:	4043	663	3380	84%

Detailed Statistics of Punjab:

S.NO.	PROVINCE	FILLED	NO. OF TRAINED PERSONNEL	NO. OF UNTRAINED PERSONNEL	% OF UNTRAINED
1.	Punjab	4043	663	3380	84%
2.	Sindh	800	25	775	98%
3.	N.W.F.P.	347	41	306	88%
4.	Baluchistan	42	-	42	100%

Detailed Statistics of Rawalpindi Region:

S.NO	DESIGNATION	SANCTIONED POSTS	FILLED	UNFILLED	NO. OF TRAINED PERSONNEL	% OF UNTRAINED
1.	Principles	128	80	42	4	97%
2.	Professors	8	5	3	4	50%
3.	Asstt. Prof	58	45	13	3	95%
4.	Chief Instructors	8	8	-	-	100%
5.	Sr. Instructors	120	87	33	12	90%
6.	Instructor	675	503	172	34	95%
7.	Jr. Instructors	545	541	4	32	94%
8.	Head of Deptt.	51	45	6	3	94%

3.7.2 UPGRADING STAFF COMPETENCIES BY CPSC PROGRAMS

Since 1974, the Colombo Plan Staff College for Technician Education (CPSC) has been offering college based courses regional/sub-regional Workshops/Courses, and seminars for the technical experts and administrators/ policy makers for the upgrading of technician education in the region. Pakistan being member country has availed itself of all such facilities offered by the College. Besides this the CPSC also has a program to assist member countries to organise in-country programs. The CPSC provides services of one or two experts to act as resource persons while the local costs are to be met by the country concerned. These courses are very useful in the sense that while participation in CPSC based course is limited (1 or 2 only) relatively large number of persons can participate in-country courses. Moreover, the topics and themes of these course can be decided by the country concerned keeping in view its needs and priorities.

Unfortunately, since 1988 Pakistan has not been able to organise in-country programs due to the non-availability of funds. In order to make in-country program a regular activity and to get necessary funds for organising in-country programmes on regular basis, a staff development project is being developed at a capital cost of Rs.4.53 million for a duration of five years. The project will help to bring quality improvement of technician education in the country.

3.8 RECOMMENDATIONS AND CONCLUSIONS

1. The majority of teachers employed under the Directorates of Technical Education do not have any teacher training. The rest have teacher training of different lengths ranging from a few weeks to a year. The training in a minimum number of desirable components such as psychology, methods, media,testing and evaluation, laboratory/shop management is essentially required.

2. The present situation indicates that 77 per cent commerce teachers and 46 per cent technical teachers have no teacher training.

3. The present composition of the teaching community in polytechnics show that more than one half of the teachers hold the Diploma of Associate Engineer as their maximum qualification in their field of specialisation and they have been teaching the courses of the final year of diploma classes. Their subject upgrading is essentially.

4. Technological changes are very rapid. Computer based technology, fibre optical link, LASER applications, Biomedical and Robotics are some new emerging fields. A working teacher does not have any eccess to resources with basics. Similarly, computer applications in accounting, management and other commercial practices are alien to the teachers of commercial education. Courses of appropriate duration are needed to be arranged for the teachers of technical and commercial education.

5. The curriculum relating to technical commercial education should include the requirements of the industry and enterprises. A liaison with industry and enterprises is very essential. This is not possible at polytechnic and commercial institution level.

6. No training is imparted when a teacher moves from lower to higher level. In the majority of cases, teachers are promoted to administer the affairs of institutions without any administrative training. They are forced into a situation of managing the finances without knowledge of financial procedures and rules. Management training is essential before a working teacher is promoted to manage any institution or department.

7. Cost-effectiveness management of lab and shops is need of the hour. Teaches are unaware of such type of terminology.

8. Teaching-Learning resources for technical and commercial subjects are scarcely available in the market. Mass failures of students in examinations are due to the lack of relevant textual material and due to resource constraints. Text book boards are reluctant to produce textual material on technical subjects. Some organisation should take care of this important aspect.

9. Relevant data on available technical manpower, technical manpower requirements, the potential for producing manpower and etc. are needed for future planning. More data from industries and enterprises are also needed to establish the quality of manpower requirement. Similarly, complete data on the activities and

inputs available in all technical institutions is needed.

Small-scale investigation and research are required to put forward the solutions of existing problems.

11. The objectives of NTTTC if properly taken care of will provide the solutions to the problems mentioned findings 1 to 10.

12. Quality improvements require essential inputs which need to be arranged as a priority.

APPENDIX 1

OBJECTIVES AND FUNCTIONS OF NTTTC

1. To Conduct training and Staff Development Programs:

   a. To arrange training programs for in-service teachers of Technical Education.

   b. To conduct courses for updating of subject matter knowledge.

   c. To organise institute based courses.

   d. To hold seminars, conferences and workshops for teachers and administrators, in technical education.

   e. To organise staff appraisal programs.

   f. To provide guidance and coordinate the activities of teachers training Wings functioning under the Provincial Governments, as these would be the Extension Centres.

2. To undertake curriculum development and educational services:

   a. To undertake curriculum development.

   b. To promote activities for development of teaching-learning resources.

   c. To develop instructional materials for laboratory and workshop courses.

   d. To develop textbooks and reading materials.

   e. To introduce reforms in student assessment and examination system.

   f. To prepare learning packages, training modules and multi-media resources.

   g. To organise information, documentation and reprographic services.

   h. To promote the use of educational technology.

   i. To provide library facilities for research and training.

3. To provide educational planning, management and research services:

   a. To promote investigation, research and evaluation.

   b. To study and analyse the needs for appropriate technologies and the changing parameters of jobs for products of technical education.

   c. To develop "Academic Models" for training of Technical Teachers.

   d. To undertake innovative and development projects.

   e. To organise consultancy and extension services.

   f. To collect, compile, analyse and disseminate information for the planning and development of technical education.

   g. To act as an intermediary institution for offering policy options.

h. To develop strategies for the planning and management of resources.

i. To translate national policies into implementable projects.

4. To establish liaison with industry.

a. To arrange training of students and teachers in industry.

b. To associate industry in curriculum development process.

c. To formulate job descriptions in industry for the products of Technical Education.

d. To maintain close liaison with the field as well as policy-making bodies.

e. To determine the influence of planned technological changes on future jobs for the products of technical education.

OPERATION OF NTTTC

1. NTTTC was established in 1982 and became operational in 1987. The following activities were undertaken by the faculty members with instructional work and the setting up of the laboratories.

a. Assisting in the evaluation, equalising and prioritising of international bids for the procurement of equipment for the college.

b. Assisting in the preparation of the layout plans of laboratories/workshops and installation of equipment, therein.

c. Preparation of objectives, strategies, procedures and course outlines for short courses of NTTTC, Islamabad.

d. Preparation of a schedule of activities for the full year and the development of teaching learning material for the training programs.

2. While considering the role of NTTTC as an apex organization in the Planning and Designing of Technical Education in Pakistan it has been observed that the College conducted 15 training (short, long courses, workshops, seminars) programs and it developed 32 manuals and 12 research studies. The College has rendered its advisory services to the Polytechnic for Boys and Girls in preparing the specifications of equipment, evaluating, equalising and prioritising the international bids. The College has always acted as a supporting arm to the Ministry of Education in formulating the policy regarding the Technical/Vocational Education of the country. The College has supplemented the Ministry with the various reports/projects of a technical nature. The College has been helping the Ministry in preparing/drafting the working papers for IPDC activities regarding technical education. The College worked as the Secretariat for the Task Force on Technical Education and Vocational Training Policy formulation funded by the Asian Development Bank.

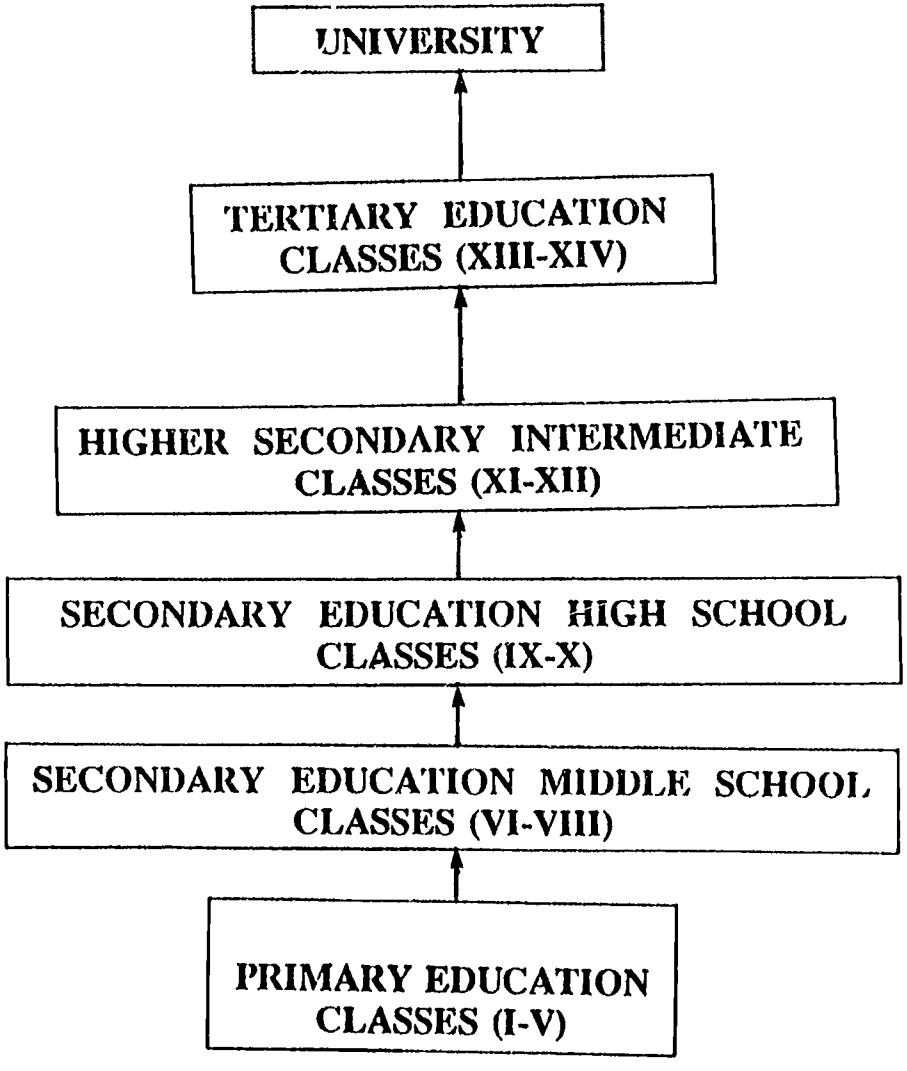
3. Responsibilities to this College were never undertaken anywhere in the country and much of the work had to be done to make the College accomplish its objectives. Scarcity of financial resources and a shortage of properly qualified and educated staff were the major hindrances in the development of this College. A lot of innovative measures and collaboration with the Provinces had to be undertaken in order to achieve the Colleges target needs and required inputs for the development of faculty, teaching-learning resources, books and manuals, curriculum and other academic activities.

4. This institution took off very well. Its programs grew properly covering many objectives of this institution including programs sponsored by the international agencies.

5. The limitation of funds for training and other activities also reduced the programs. The achievements of this institution up to 1992–93 is included in the table give below:

Appendix II

THE FORMAL EDUCATION SYSTEM



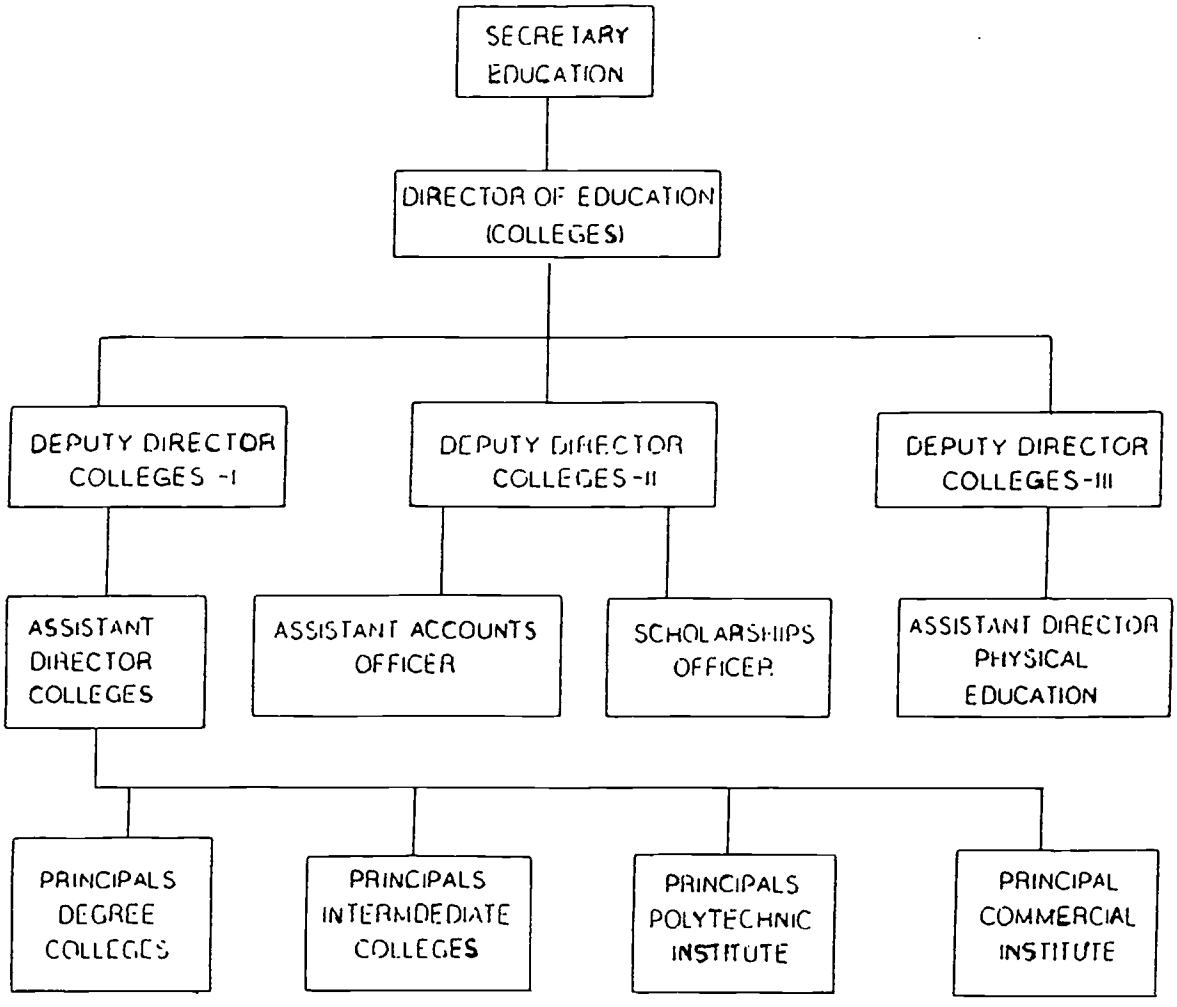
Appendix III

SOME ACHIEVEMENTS

YEAR	Trg./Workshop / Seminar budget as per target of PC-1.(Million)	Actual budget provided for training programmes (Million)	Faculty Member out of 21.	Output Target (PC-1)	ACHIEVEMENTS AGAINST THE TARGETS OF B.O.G.						Remarks
					Research Studies out of Prescribed No. (5)	Manual/Lab./ W. Guides. Out of Prescribed No.(5)	Workshops/ Seminars. Out of prescribed No. (2)	Short Courses. Out of Prescribed No. (4)	Long Courses. Of prescribed No.(1)	Trained Output	
1987-88	9.717	0.176 (1.81%)	5	820 15	1	4	1	1	-	52	-Faculty less -Budget small
1988-89	9.717	0.23 (2.37%)	8	820 20	2	4	1	2	-	67	-do-
1989-90	9.717	0.52 (5.35%)	8	820 44	5	4	1	1	1	77	-do-
1990-91	9.717	0.9 (9.26%)	13	820 76	4	20	3	4	1	197	-do-
1991-92	9.717	0.2 (2.06%)	13	820 17	-	5	-	-	1	35	-do-
1992-93	9.717	0.5 (5.15%)		820 42		-	2	2	2	97	-do-

Appendix IV

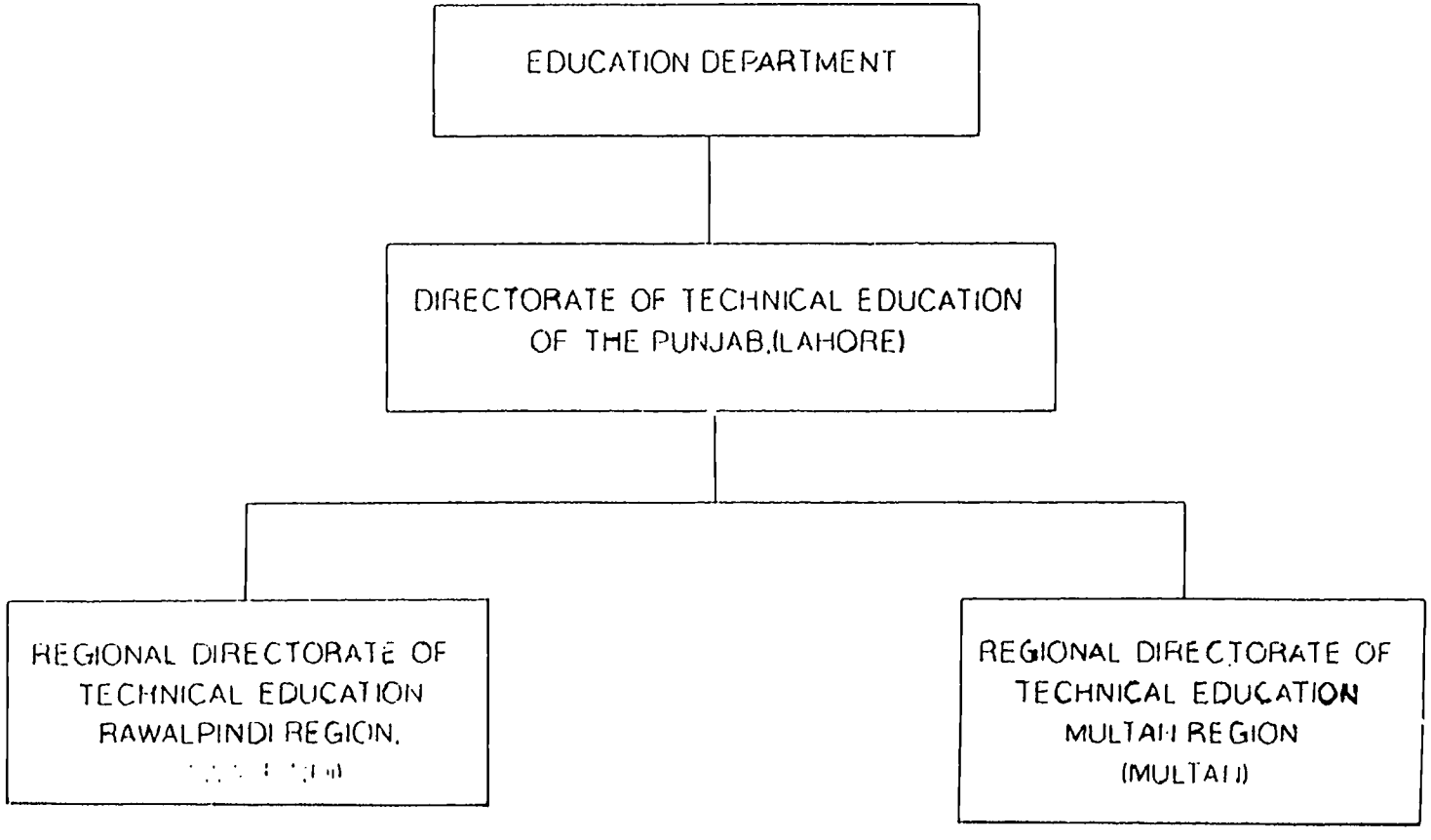
ORGANISATIONAL STRUCTURE OF THE DEPARTMENT OF EDUCATION



Appendix V

DEPARTMENT OF EDUCATION

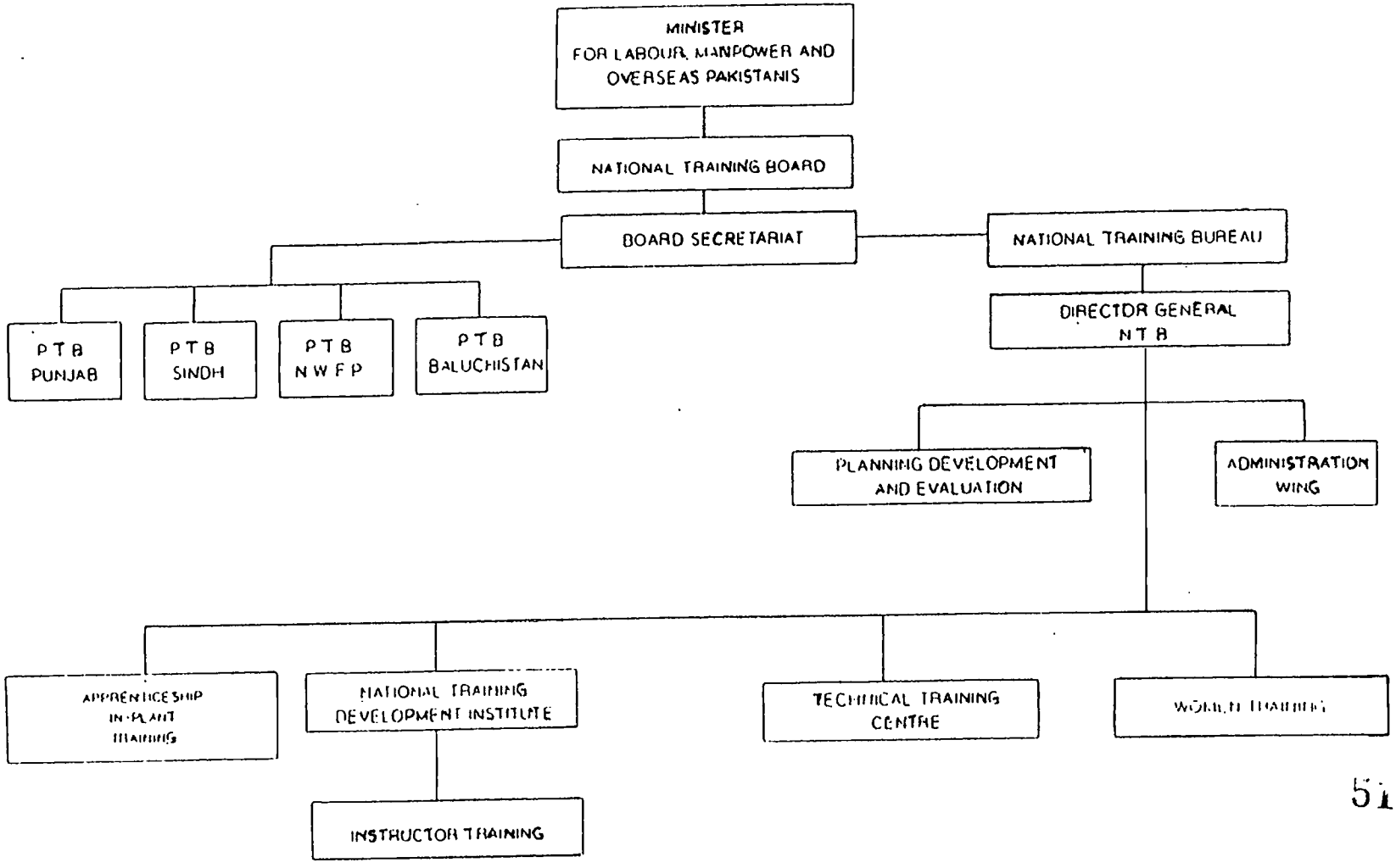
ORGANISATIONAL STRUCTURE OF THE DIRECTORATE OF TECHNICAL EDUCATION



Appendix VI

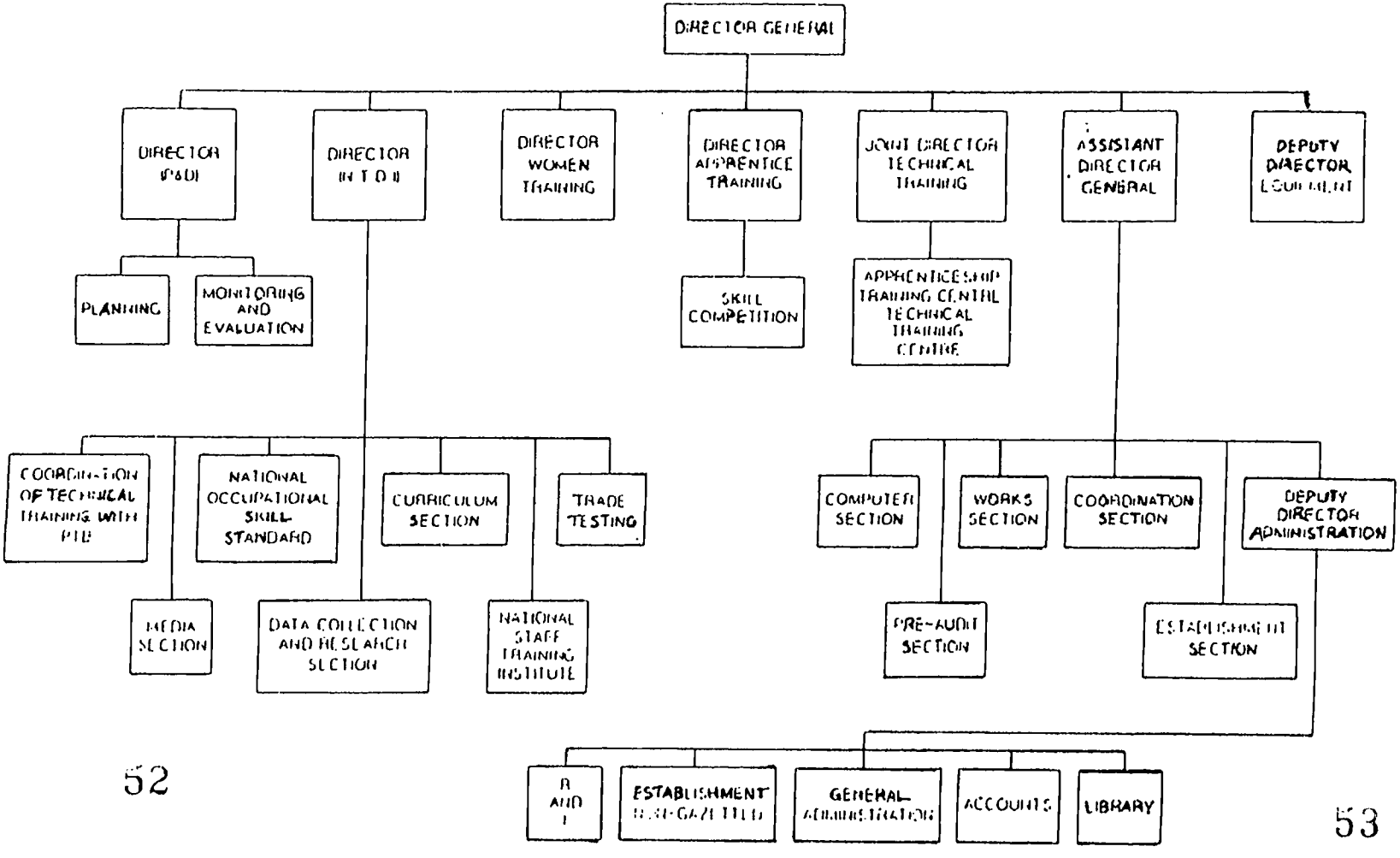
GOVERNMENT OF PAKISTAN

ORGANISATIONAL STRUCTURE OF THE NATIONAL TRAINING BOARD



Appendix VII

ORGANISATIONAL STRUCTURE OF THE NATIONAL TRAINING BUREAU



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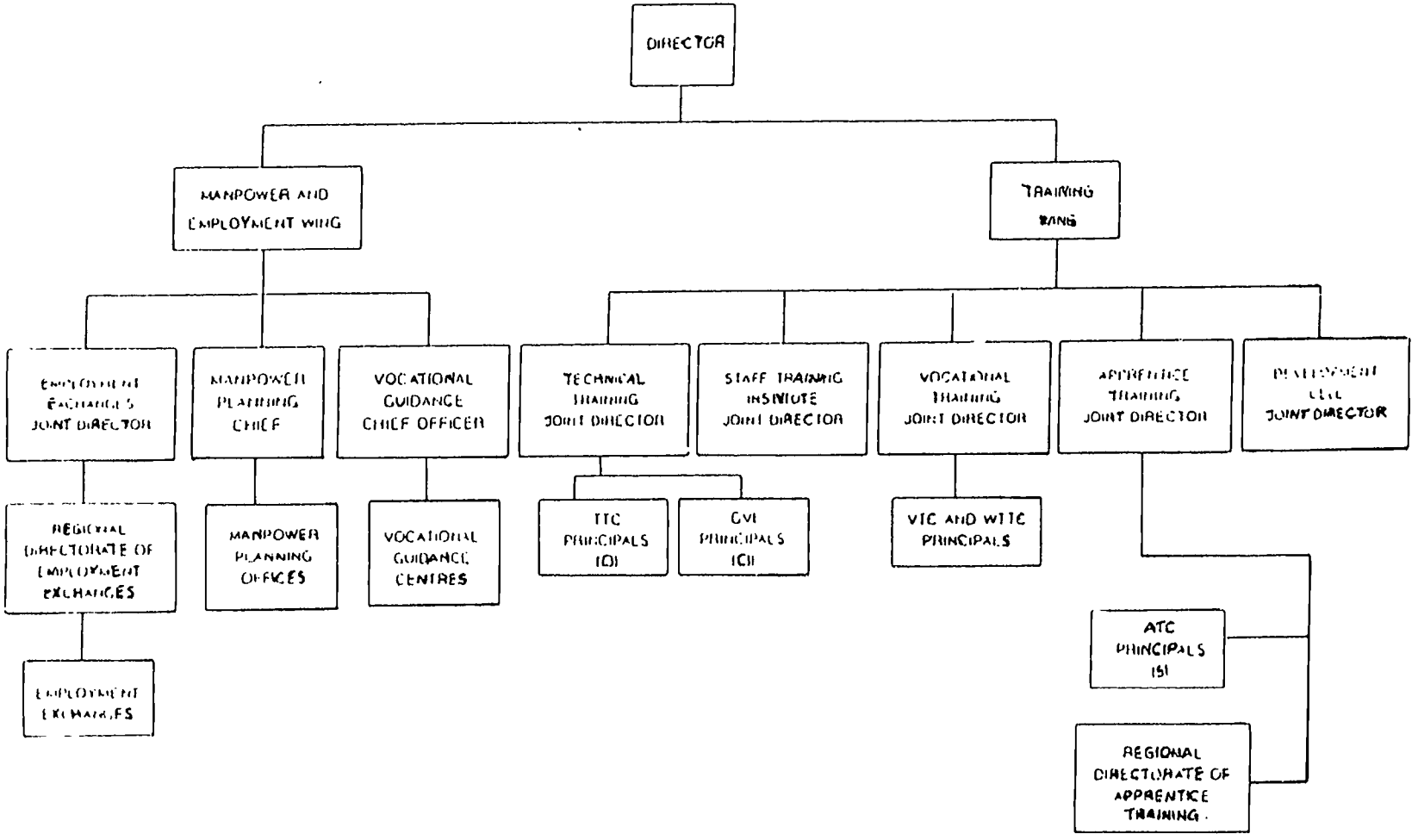
Appendix VIII

ORGANISATIONAL STRUCTURE OF THE DIRECTORATE OF MANPOWER AND TRAINING



Appendix IX

PAKISTAN
ENROLMENT INTAKE AND OUTPUT OF EDUCATION SYSTEM
BY LEVEL AND BY GENDER
1988/89

LEVEL	ENROLMENT			INTAKE			OUTPUT		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Primary	7,508,865	4,941,823	2,567,042	2,772,486	1,828,783	943,703	993,542	699,935	293,607
Middle	2,148,827	1,543,637	605,190	870,273	623,980	246,293	610,882	440,550	170,332
Secondary	714,894	517,682	197,212	407,372	292,486	114,884	440,833	323,963	116,870
Intermediate	368,732	247,615	121,117	184,366	123,808	60,559	179,015	132,251	46,764
Degree Colleges & Universities									
BA/B Sc	116,528	71,524	45,004	58,264	35,762	22,502	28,064	17,225	10,839
B Com	10,742	9,548	1,194	4,454	4,058	396	3,750	3,333	417
M Com	3,146	2,794	352	1,573	1,397	176	485	431	54
B Ed	3,388	1,376	2,012	3,073	1,219	1,854	3,900	1,584	2,316
MA/M Sc	20,959	15,510	5,449	10,480	7,755	2,725	21,382	15,861	5,521
M Phil	851	638	213	426	319	106	76	57	19
Ph D	330	270	60	165	135	30	54	44	10
Professional College & Universities									
B Sc Engineering	18,984	18,419	565	4,746	4,605	141	3,773	3,747	26
M Sc Engineering	392	381	11	196	190	6	47	42	5
Medical	18,629	13,027	5,602	2,992	1,632	1,360	2,282	1,596	686
Bachelor of Law	6,325	6,088	237	3,163	3,044	119	2,842	2,736	106
Master of Law	143	138	5	72	69	3	*	*	*
B Sc Agriculture	4,300	4,281	19	2,150	2,141	10	1,145	1,140	5
M Sc Agriculture	1,701	1,684	17	851	842	9	412	408	4
B Sc Agri Eng	1,446	1,442	4	723	721	2	130	130	0
M Sc Agri Eng	44	44	0	22	22	0	OUTPUT MERGED INTO B Sc AGRI ENG		
Polytechs/Monotechs									
Certificate Tech	*	*	*	*	*	*	*	*	*
Diploma Tech	32,578	30,281	2,297	10,658	9,681	977	4,425	4,113	312
B Tech	1,173	1,173	0	587	587	0	195	195	0
B Tech Hons	597	597	0	199	199	0	*	*	*
Vocational									
Certificate(TTCs)	11,038	11,038	0	7,892	7,892	0	6,333	6,333	0
Female CVIs	9,116	0	9,116	*	*	*	4,557	0	4,557
Apprenticship 3 Yrs	728	728	0	400	400	0	205		0
Other Institutes	14,208	*	*	*	*	*	*	*	*

* Data not available.

Appendix X

VOCATIONAL, TECHNICAL & ENGINEERING INSTITUTIONS IN PAKISTAN
1988-1989

Province	Agro-technical schools	Vocational Institutes			Commercial Institutes	Govt. Colleges of Technology/ Polytechnic Institutes			Engineering Colleges /Universities	
		Boys	Girls	Total		Male	Female	Total	Universities	Colleges
Punjab	3128	38	98	136	†111	14	8	22	1	4
Sind	500	9	57	66	34	15	3	18	2	1
NWFP	921	15	10	25	13	5	1	6	1	-
Baluchistan	51	4	-	4		1	-	1	-	1
Federal Area/ Cantt/Garrison	98	2	-	2	-	-	1	1	-	-
A.J.K.	141	2	-	2	-	-	-	-	-	-
PAKISTAN TOTAL	4829	*70	165	235	158	**35	***13	48	4	6

* These include 56 Vocational Institutions.
** This include 11 Colleges of Technology.
*** This include 13 Women Polytechnic Institutes established by Women Div.,
† This include 12 commercial training institutes for female.
Source: Data compiled by S+TV Wing (information received from concerned agencies).

Appendix XI

NUMBER OF VOCATIONAL, COMMERCIAL, TECHNICAL INSTITUTIONS ALONGWITH INTAKE CAPACITY, ENROLMENT AND OUT PUT, IN PAKISTAN

Province	Agro-technical Schools				Vocational Institution No. of Institutions						Polytechnic Institutions No. of Institutions						Commercial Institutions No. of Institutions					
	No.	Intake Capacity	Enrolment	Output	M	F	T	Intake Capacity	Enrolment	Out Put	M	F	T	Intake Capacity	Enrolment	Out Put	M	F	T	Intake Capacity	Enrolment	Out Put
Punjab	3126	-	405960		†38	98	136	7061	6687	2610	14	8	22	5270	12893	1433	99	12	111		15575	4391
Sind	500	-	90768		†9	57	66	4666	4574	2481	15	3	18	5404	12842	2735	34	-	34	1680	1796	1563 (Apprx:)
NWFP	921	-	24242		15	10	25	3590	1852	1175	5	1	6	900	2742	469	13	-	13	2440	2920	1751
Baluchistan	51	-	10250		4*	-	4	830	726	506	1	0	1	150	436	131						
Federal Area	88	-	26015		2**	-	2	220	126	60	-	1	1	40	100	26						
A.J.K	141	-	-		2**	-	2	-	-		-	-	-	-	-							
PAKISTAN TOTAL	4829	-	55707		70	165	235	15537	12118	7032	35	13	48	11764	8821	4796	146	12	158		20291	7705

* This include 14 Colleges of Technologies.
** This include 13 Women Polytechnic Institutes established by Women Division.
† These include 56 Vocational Institutes controlled by Ministry of Labour and Manpower.

Source: Data compiled by SAPE Wing(information received from concerned agencies).

Appendix XII

PAKISTAN
GOVERNMENT POLYTECHNICS/COLLEGES OF TECHNOLOGY
ANNUAL INTAKE CAPACITY AND ENROLMENT BY TECHNOLOGY
1987/88

TECHNOLOGY	ANNUAL INTAKE CAPACITY *						TOTAL ENROLMENT					
	PUNJAB	SIND	NWFP	B'STAN	FED.CAP	TOTAL	PUNJAB	SIND	NWFP	B'STAN	FED.CAP	TOTAL
1. Civil	1340	800	200	50		2390	4175	1992	730	181		7078
2. Electrical	995	880	250	50		2175	2471	2233	743	169		5616
3. Mechanical	995	880	250	50		2175	2522	1787	678	133		5120
4. Architecture	50	50	50		20	170	137	113	18		25	293
5. Auto & Diesel	120	300	50			470	361	552	150			1063
6. Auto & Farm	150					150	302					302
7. Chemical	300	150	50			500	655	290	145			1090
8. Electronic & TV	390	400	50		20	860	1020	878	181		25	2104
9. Refrig. & AC	75	200				275	169	387				556
10. Clothing/Garment /Dress Design	210	80	50			340	337	205	77			619
11. Instrumentation	170					170	404					404
12. Textile/Spinning /Weaving	50	100				150	129	320				449
13. Welding & Sheet Metal	** 20	30				50	46	93				139
14. Biomedical	20	40				60		40				40
15. Civil Drafting	50					50	124					124
16. Foundry & Pattern Making	40					40	99					99
17. Wood Working		50				50		154				154
18. Watch & Instruments		25				25		61				61
19. Printing & Graphic Arts	100					100	226					226
20. Power		100				100	203					203
21. Glass & Ceramics		50				50	130					130
22. Secretarial		50				50	94					94

Source: Directorates of Technical Education

Note:
* Including second shift/Evening Diploma Programme
** Post Diploma

Appendix XIII

DEPARTMENT OF LABOUR
DIRECTORATES OF MANPOWER AND TRAINING
TRAINING CENTRES

NUMBER, CAPACITY; ENROLMENT AND OUTPUT PER YEAR BY PROVINCE AND TYPE OF CENTRE JULY 1989

	Nos.	Capacity	Enrolment	Output
BOY'S INSTITUTIONS				
Punjab				
GVIs	13	2780	2386	1450
TTCs	12	4740	3365	1680
ATCs	5	820	652	175
Punjab Total	30	8,340	6,403	3,305
Sind				
TTCs	4	1591	1373	565
YVCs	7	405	430	383
Sind Total	11	1996	1803	948
NWFP				
TTCs	4	1365	936	402
ATC	1	112	76	23
SDCs	8/12[a]	384	354	200
NWFP Total	13/12	1861	1366	625
Baluchistan				
TTCs	4	780	694	461
VTC	1	50	34	45
Baluchistan Total	5	830	728	506
TTC Islamabad	1	220	128	64
BOYS TOTAL	72	13,247	10,428	5,448
WOMEN'S INSTITUTIONS				
TTC Punjab	1	256	108	80
TTC Sind	1	60	58	41
WOMEN TOTAL	2	316	166	121
PAKISTAN TOTAL LABOUR DEPT.ONLY	74	13,563	10,594	5,569

Source: Mission calculation based on data provided by provincial directorates.

Note: [a] Operated by GTZ with UNHCR funding cooperation in collaboration with the provincial labour department, mainly for the training of Afghan refugees.

Appendix XIV

PAKISTAN
NON-FORMAL TRAINING SYSTEM INSTITUTIONS
SUMMARY OF CAPACITIES, ENROLMENT AND OUTPUTS
1988/1989

Directorates/ Agencies	Number of Institutions	Capacity	Annual Enrolment	Annual Output
1. Directorates of Manpower and Training, Dept. of Labour. [a]	74	13,563	10,594	5,569
2. Small Industries Corps. [b]	306	9,263	9,499	7,361 est
3. Agency for Barani Areas Development. [c]	42	3,344	2,392	2,000 est
4. Directorate of Agriculture. [c]	7	560	500	425 est
5. Directorate of Industries and Mineral Development.	5	290	240	78
6. Directorate of Agriculture Engineering.	4	200	170	200 est
7. Overseas Pakistani Foundation.	6	1,010	407	300 est
8. Agriculture Cooperative Department.	1	120	N.A.	N.A.
9. ILO-UNHCR [d]	12	685	637	570 est
Total	457	29,035	24,439	16,600 est.

Source: Mission Data

(a) In Baluchistan, Directorate of Labour and Manpower.
(b) In NWFP, Small Industries Development Board and in Baluchistan, Directorate of Small Industries.
(c) In Punjab only.
(d) In collaboration with provincial government of Baluchistan.

Appendix XV

TECHNICAL EDUCATION

The New Educatioal Policy (NEP) places great emphasis on Technical Education.

MAJOR TARGETS OF NEP

		Existing	Target (2002)
A.	Polytechnic's:		
	Institutions (No.)	45	95
	Enrollment (No.)	24860	50500
	Teachers (No.)	1546	3241
B.	Colleges of Technology:		
	Institutions (No.)	11	22
	Enrollment (No.)	13863	26000
	Teachers (No.)	737	1474
C.	Vocational:		
	Institutions (No.)	404	782
	Enrollment (No.)	56397	100000
	Teachers (No.)	1685	3128
D.	Vocational High Schools:		
	Institutions (No.)	NIL	1000
	Enrollment (No.)	NIL	50000
	Teachers (No.)	NIL	16000

Appendix XVI

TECHNICAL VOCATIONAL EDUCATION INSTITUTIONS*

PROVINCE	NO.OF DIV.	NO.OF GPIWs	DIV. UNCOV.	NO.OF DISTT.	NO.OF GPIs.	DISTT UNCOV.	NO.OF TEHSIL	NO.OF GVI etc.	TEHSIL UNCOV.	NO.OF GVIWs	TEHSIL UNCOV.	NO.OF CTIs	TEHSIL UNCOV.	NO.OF CTIW	TEHSIL UNCOV.	REMARKS
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PUNJAB	8	8	1	34	16	17	112	51	71	120	24	90	24	12	100	
SIND	5	3	2	21	35 (16 U.C)	2	88	19	77	51	49	90 (77 C.C)	20	1	92	
N.W.F.P.	8	3 (2 U.C)	5	21	11	10	49	21	32	10	39	8	41	-	49	
BALOCHISTAN	6	Nil	6	26	1	25	110	16	96	10	102	2	108	-	110	
FATA	4	Nil	4	7	Nil	7	42	10	32	Nil	42	5	37	1	41	
FANA	1	-	1	5	-	5	21	-	21	-	21	-	21	-	21	
TOTAL:	32	14 (2 U.C)	19	114	63 (16 U.C)	66	422	117	329	191	277	195 (77 C.C)	251	14	413	

U.C. = Under Construction.
C.C. = Commercial Centres.

*Includes Institutions under Education Department, Labour & Manpower Department and in case of Punjab for ABAD as well.