APPENDICES for CHAPTER 5

Appendix Table 5.2.1 Vehicles on Roads in the Future

1982-	M/C C1	Cars jeps,pup C2	Wagons C3	Buses C4	Trucks tankers C5	Total	GDP Rs. mill x1	Population (,000) x2	GDP per capita x3
82/83	424,215	295,928	13,284	27,361	42,761	803,549	284,667	89,120	3,194
83/84	517,448	350,713	16,422	30,955	49,165	964,703	295,977	91,880	3,221
84/85	581,255	402,473	19,351	32,947	54,428	1,090,454	321,751	94,730	3,397
85/86	657,569	440,315	23,815	34,637	60,354	1,216,690	342,224	97,670	3,504
86/87	700,004	475,181	27,028	36,117	66,120	1,304,450	362,110	100,070	3,619
87/88	751,970	513,157	32,632	38,641	71,660	1,408,060	385,416	103,820	3,712
88/89	818,398	573,453	36,097	40,814	78,413	1,547,175	403,948	107,040	3,774
89/90	896,179	617,810	39,764	43,275	82,678	1,679,706	422,284	110,360	3,826
90/91	964,408	654,726	43,387	45,637	86,872	1,795,029	446,005	113,780	3,920
91/92	1,060,555	726,744	49,702	48,521	96,928	1,982,450	480,234	117,320	4,093
92/93	1,166,491	810,200	56,986	51,651	109,358	2,194,686	491,345	120,955	4,062
97/98	1,567,513	1,162,677	88,014	69,152	153,501	3,040,857	688,028	139,975	4,915
02/03	2,015,475	1,639,171	129,943	91,854	214,748	4,091,191	934,737	159,492	5,861
05/06	2,317,676	1,956,544	157,870	106,975	255,472	4,794,537	1,119,492	172,485	6,490

Regression Output:C1 m/c

Constant		-1435377
Std Err of Y Est		21048.875
R Squared		0.993
No. of Observations		11
Degrees of Freedom		8
X Coefficient(s)	0.19408	20.49910
Std Err of Coef.	1.69006	11.42023

Regression Output: C2 car

Constant		-1314857
Std Err of Y Est		35959.8
R Squared		0.954684
No. of Observations		11
Degrees of Freedom		9
	gdp/pop	
X Coefficient(s)	504.039	
Std Err of Coef.	36.60481	

Regression Output: wagon

Constant		-129994.8
Std Err of Y Est		3113.067
R Squared		0.956075
No. of Observations		11
Degrees of Freedom		9
	gdp/pop	
X Coefficient(s)	44.35263	
Std Err of Coef.	3.168906	

Regression Output: C4 bus

Constant		-48888.11
Std Err of Y Est		1627.736
R Squared		0.958915
No. of Observations		11
Degrees of Freedom		9
	gdp/pop	
X Coefficient(s)	24.01449	
Std Err of Coef.	1.656933	

Regression Output:C5 truck

Constant		-164713
Std Err of Y Est		4726.657
R Squared		0.952629
No. of Observations		11
Degrees of Freedom		9
	gdp/pop	
X Coefficient(s)	64.74354	
Std Err of Coef.	4.812451	

Regression Output: C5 truck

Source : Vehicles on roads are from NTRC, 1994
Regression: GDP, Rs million in constant prices of 1993
Population in million
x variables in future years are by the study team, 1994
When a coefficient is (-), a variable of per capita GDP is used for the estimate in future
M/c is estimated by two variables, GDP and Population, but others are by GDP/Pop alone.

APPENDICES for CHAPTER 6

Appendix Table 6.1.1 Number of Station by Signalling Type

No.	System	Present
1	All-Relay Interlocking	48 Stations
2	Colour Light Signalling	6 Stations
3	Standard - III Signalling	188 Stations
4	Standard - II Signalling	23 Stations
5	Standard - I Signalling	220 Stations
6	Non-Interlocked Signalling	241 Stations
7	D.K. Sidings	90 Stations
8	Automatic Block Signalling	60 kms
9	Tokenless Block Single Line	125 Stations
10	Tokenless Block Double Line	102 Stations
11	Axle Counters	2 Stations
12	Token Block Single Line	189 Stations
13	Paper Line Clear Ticket	341 Stations
14	Mechanized Marshalling Yard	1 Yard

Appendix Table 6.1.2 Pakistan Railways : Number of Locomotives

Year	Broad-Gauge			Metre-Gauge	Narrow-Gauge	Total
	Steam (No.)	Diesel (No.)	Electric (No.)	Steam (No.)	Steam (No.)	(No.)
1983-84	356	492	29	31	35	943
1984-85	339	482	29	31	35	916
1985-86	278	512	29	25	35	879
1986-87	201	547	29	25	35	837
1987-88	137	566	29	25	35	792
1988-89	125	565	29	25	29	773
1989-90	121	564	29	25	29	768
1990-91	121	564	29	22	17	753
1991-92	121	563	29	22	17	752
1992-93	90	549	29	18	17	703

Source : P.R. Year Book, 1992-93

Appendix Table 6.1.3 Pakistan Railways : Number of Coaching Vehicles

Year	Broad-Gauge		Metre-Gauge		Narrow-Gauge		Total	
	Passenger carriages (No.)	Other coaching vehicles (No.)	Passenger carriages (No.)	Other coaching vehicles (No.)	Passenger carriages (No.)	Other coaching vehicles (No.)	Passenger carriages (No.)	Other coaching vehicles (No.)
1983-84	2201	538	97	30	107	41	2405	609
1984-85	2293	538	87	18	107	35	2487	591
1985-86	2515	457	87	18	120	31	2722	506
1986-87	2471	473	79	18	106	31	2656	522
1987-88	2500	450	71	18	92	26	2663	494
1988-89	2437	465	71	18	90	31	2598	514
1989-90	2314	445	71	12	89	31	2474	488
1990-91	2189	370	68	10	82	27	2339	407
1991-92	2285	370	58	10	82	27	2425	407
1992-93	2285	370	58	10	82	27	2425	407

Source : P.R. Year Book , 1992-93

Appendix Table 6.1.4 Pakistan Railways : Number of Wagons

Year	Broad-Gauge (No.)	Metre-Gauge (No.)	Narrow-Gauge (No.)	Total (No.)
1983-84	34,613	743	426	35,782
1984-85	34,261	654	426	35,341
1985-86	34,184	654	399	35,237
1986-87	33,814	654	399	34,867
1987-88	35,596	609	301	36,506
1988-89	35,339	609	301	36,249
1989-90	34,938	604	300	35,842
1990-91	33,947	604	300	34,851
1991-92	29,465	604	300	30,369
1992-93	28,547	604	300	29,451

Source : P.R. Year Book 1992-93

Appendix Table 6.1.5 Passengers Classified

(Thousand)

Year	Air-Conditioned Class				First Class				Air-Condition Economy Class				Second Class		Total
	Sleeper		Sitter		Sleeper		Sitter		Lower						
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.
1983-84	80	0.07	163	0.15	608	0.57	2,837	2.65					103,427	96.56	107,111
1984-85	74	0.08	125	0.13	609	0.64	2,414	2.55					91,479	96.60	94,701
1985-86	78	0.09	120	0.16	621	0.75	2,049	2.47					80,060	96.52	82,928
1986-87	80	0.11	175	0.22	569	0.73	1,909	2.44					75,408	96.50	78,141
1987-88	96	0.12	243	0.30	614	0.76	2,075	2.55					78,211	96.27	81,239
1988-89	83	0.10	243	0.29	618	0.73	2,252	2.66	65	0.08			81,433	96.15	84,694
1989-90	79	0.10	309	0.37	618	0.73	2,468	2.92	110	0.13	450	0.53	80,559	95.23	84,593
1990-91	73	0.10	316	0.37	615	0.72	2,339	2.76	195	0.23	9,478	11.16	71,883	84.67	84,899
1991-92	59	0.11	306	0.42	541	0.74	1,558	2.13	336	0.46	16,405	22.38	54,093	73.80	73,298
1992-93	57	0.16	266	0.45	470	0.80	517	0.88	342	0.58	21,403	36.25	35,984	60.95	59,039

Source : P.R. Year Book 1992-93

Appendix Table 6.1.6 Commodity - Wise Break - Down of Tonnes Carried

Serial No.	Commodities	1987-88		1988-89		1989-90		1990-91		1991-92		1992-93		Serial No.
		Tonnes	%	Tonnes	%	Tonnes	%	Tonnes	%	Tonnes	%	Tonnes	%	
1	Ballast and Stone	51	0.44	31	0.3	19	0.2	36	0.47	35	0.46	36	0.46	1
2	Cement	883	7.59	689	6.61	491	5.29	533	6.91	415	5.49	297	3.82	2
3	Chemical manures (fertilizers)	1311	11.26	846	8.11	747	8.05	917	11.88	814	10.77	825	10.62	3
4	Coal and coke for the public	271	2.33	240	2.3	278	3	235	3.05	211	2.79	171	2.2	4
5a	Coal, coke and patent fuel for Railways (including H.S.D. and furnace oil)	494	4.24	405	3.88	414	4.46	382	4.95	340	4.5	250	3.22	5a
5b	Railway material and stores	1386	11.91	876	8.4	742	7.99	618	8.01	732	9.68	590	7.6	5b
6	Cotton raw, unpressed and full pressed	56	0.48	38	0.36	1	0.01	1	0.01	5	0.07	1	0.01	6
7	Fire-wood	65	0.56	42	0.4	43	0.46	41	0.53	44	0.58	43	0.55	7
8	Fruits and vegetables fresh	2	0.02	1	0.01	3	0.03	3	0.04	1		1	0.01	8
9	Grass dry	42	0.36	39	0.37	39	0.42	27	0.35	27	0.36	23	0.3	9
10	Gypsum	62	0.53	72	0.69	54	0.58	34	0.44	45	0.6	71	0.91	10
11	Hides, skins or pelts common													11
12	Iron and steel Division 'A' includes angles, axes, sheets, girders, etc.	22	0.19	24	0.23	25	0.27	21	0.27	35	0.46	53	0.68	12
13	Iron and steel Division 'B' includes chimneys, gutters, pipes, etc.	37	0.32	2	0.02	2	0.02	3	0.04	5	0.07	1	0.01	13
14	Iron and steel Division 'C' includes blooms, pig iron, etc.	429	3.69	234	2.24	42	0.45	98	1.27	209	2.76	223	2.87	14
15	Jagree													15
16	Jute, manufactured	7	0.06	3	0.03	9	0.1	1	0.01					16
17	Live stock	9	0.08	13	0.12	7	0.08	3	0.04			1	0.01	17
18	Machinery, electrical	1	0.01			1	0.01	1	0.01			1	0.01	18
19	Machinery, other than electrical	17	0.15	49	0.47	41	0.45	20	0.26	30	0.4	32	0.41	19
20	Molasses													20
21	Oil Division 'D' includes vacuum refined edible oil	204	1.75	237	2.27	222	2.39	192	2.49	135	1.79	30	0.39	21
22	Oil seeds	53	0.46	33	0.32	48	0.52	36	0.47	12	0.16	6	0.08	22
23	Ores, Common	4	0.03	2	0.02	4	0.04							23
24	Other grains and pulses	4	0.03	6	0.06	8	0.09	7	0.09	10	0.13	4	0.05	24
25	Paddy and Rice	566	4.86	766	7.35	878	9.46	392	5.08	294	3.89	331	4.26	25
26	Petroleum and other hydro-carbon oils, non-dangerous i.e. having a flashing point at or above 76 Fahr.													26
	(a) Division 'B' includes Diesel oil	1096	9.42	995	9.54	817	8.8	746	9.67	736	9.74	860	11.07	26a
	(b) Division 'C' includes furnace oil	675	5.8	627	6.01	823	8.87	553	7.16	783	10.36	1251	16.1	26b
27	Petroleum and other hydro-carbon oils, dangerous i.e. having a flashing point below 76 Fahr. includes petrol, etc.	28	0.24	8	0.08									27
28	Petroleum and other hydro-carbon oils, non-dangerous i.e. having a flashing point at or above 76 Fahr. Division 'A' includes kerosene oil, etc.	423	3.63	398	3.83	398	4.29	296	3.82	129	1.71	114	1.47	28
29	Piece goods, cotton, woollen or artificial silk, etc.	2	0.02	7	0.07	3	0.03	3	0.04	17	0.23	4	0.05	29
30	Salt	217	1.86	172	1.65	141	1.52	101	1.31	82	1.08	97	1.25	30
31	Sugar	265	2.28	106	1.02	153	1.65	79	1.02	66	0.87	64	0.82	31
32	Sugarcane	2	0.02			2	0.02	3	0.04	1		2	0.03	32
33	Timber	6	0.05	5	0.05	6	0.06	4	0.05	3	0.04	5	0.07	33
34	Tobacco manufactured	7	0.06	9	0.09	6	0.06	7	0.09	4	0.05	5	0.07	34
35	Wheat	1076	9.24	1774	17.01	1284	13.84	824	10.68	888	11.75	1046	13.47	35
36	Wool													36
37	Miscellaneous	1866	16.03	1678	16.09	1530	16.49	1501	19.45	1452	19.21	1331	17.13	37
	Total	11639		10427		9281		7717		7560		7769		

Appendix Table 6.1.7 Pakistan Railways : Trains Run

Year	No. of Passenger Trains	No. of Freight Trains	Total No. of KMs covered by Passenger and Mixed Train (Thousands)	Total No. of KMs covered by Freight Trains (Thousands)	Average No. of Wagons per Train	
					Diesel	Electric
1983-84	159,245	61,043	34,807	11,840	54.7	61.0
1984-85	156,406	57,839	35,689	11,708	57.2	61.6
1985-86	150,194	57,337	35,553	12,453	57.2	61.1
1986-87	141,586	54,106	35,419	12,672	56.5	61.4
1987-88	141,633	55,166	36,513	13,526	55.8	60.1
1988-89	144,503	51,992	35,773	14,443	56.0	58.9
1989-90	144,775	49,730	36,649	12,335	54.9	59.7
1990-91	145,230	39,190	36,181	10,162	55.9	63.0
1991-92	131,285	38,312	34,570	9,502	56.3	57.9
1992-93	118,924	33,844	33,533	9,209	56.6	60.8

Source : P.R. Year Book 1992-93

Appendix Table 6.1.8 Actual Expenditure

Serial No.	PARTICULARS	Allocation for 1988-89	Expenditure for 1988-89	Allocation for 1989-90	Expenditure for 1989-90	Allocation for 1990-91	Expenditure for 1990-91	Allocation for 1991-92	Expenditure for 1991-92	Allocation for 1992-93	Expenditure for 1992-93	Allocation for five years	Expenditure for five years
1.	MOTIVE POWER												
	- Rehabilitation of 101 D.E. Locos.	-	-	-	-	-	-	2,250	1,942	2,000	1,130	4,250	3,072
	- Procurement & Rehab: of 375 T/M	-	-	90,000	1,500	-	-	277,500	256,000	360,000	131,000	727,500	388,500
	- Structural works for D.E. Locomotives Shops & Sheds	3,000	3,000	1,500	1,000	-	-	-	-	10,000	7,200	14,500	11,200
2.	ROLLING STOCK											0	0
	- Manufacture of 300 passenger carriages	188,100	163,000	139,240	125,000	150,500	210,366	81,750	124,000	250,000	112,000	809,690	734,366
	- Manufacture of 200 bogies wagon	15,000	10,118	10	10	14,110	14,110	-	-	12,000	10,500	41,120	34,738
	- Modification of freight wagons	-	-	-	-	70,000	-	80,000	40,000	194,000	149,000	344,000	189,000
	- Spares for Unit Exchange and Inventory	-	-	-	-	120,000	-	121,000	-	250,000	150,703	491,000	150,703
	- Re-commissioning of 46 Locos.	-	-	-	-	190,000	-	352,500	352,500	53,000	53,000	595,500	405,500
	- Procurement of 5 D.E. Locos.	-	-	-	-	-	-	225,876	225,876	232,000	205,000	457,876	430,876
	- Renovation of passenger coaches	-	-	-	-	-	-	-	-	163,000	152,987	163,000	152,987
3.	TRACK REHABILITATION											0	0
	- Renewals of 650 Km rails	239,000	174,000	289,615	171,226	264,850	183,233	224,000	224,000	377,772	342,650	1,395,237	1,095,109
	- Renewals of 1000 Km Sleepers	11,000	11,000	14,387	14,387	8,070	8,070	39,840	39,840	38,200	38,200	111,497	111,497
4.	ELECTRIFICATION (KML-SMA)											0	0
	- 91 Km of single trak	-	-	-	-	-	-	-	-	-	-	0	0
	- 27.4 Km of double track	-	-	-	-	-	-	-	-	-	-	0	0
5.	TRANSFER TECHNOLOGY											0	0
	- Long crossing sleeper	-	-	-	-	-	-	177	148	-	-	177	148
	- High capacity bogie wagon	-	-	-	-	-	-	-	-	-	-	0	0
6.	LOCOMOTIVE FACTORY	150,000	109,000	216,000	80,200	616,500	593,000	727,360	535,000	259,000	206,000	1,968,860	1,523,200
7.	MANAGEMENT INFORMATION SYSTEM	-	-	-	-	5,000	-	-	-	-	-	5,000	0
8.	OTHER WORKS											0	0
	- Improvement of Sig: & Tele.	50,134	37,923	10,000	10,000	44,600	38,129	51,090	51,090	219,000	177,398	374,824	314,540
	- Improvement of level crossing line capacity works	3,990	2,408	5,298	5,000	7,500	7,000	4,000	4,000	20,000	12,000	40,788	30,408
	- Electrical Works	3,000	2,735	2,000	2,000	3,288	3,288	-	-	37,000	14,431	45,288	0 22,454
	- Feasibility studies for extension of Railway line from PSC to D.I. Khan	-	-	-	-	-	-	-	-	-	-	0	0
	- Establishment of Dry Port at PSC and LHR Dry Port	5,000	2,000	1,000	1,000	-	-	-	-	-	-	6,000	0 3,000
	- Bridge & Civil Engg: Works	10,000	7,000	11,000	8,000	14,000	12,000	14,289	13,000	12,500	11,000	61,789	0 51,000
	- Renovation of 7 stations	-	-	-	-	-	-	-	-	70,000	29,681	70,000	29,681
												0	0
	Total	678,224	522,184	780,050	419,323	1,508,518	1,069,196	2,201,632	1,867,396	2,559,472	1,803,880	7,727,896	0 5,681,979
		Allocation for 1988-89	Expenditure for 1988-89	Allocation for 1989-90	Expenditure for 1989-90	Allocation for 1990-91	Expenditure for 1990-91	Allocation for 1991-92	Expenditure for 1991-92	Allocation for 1992-93	Expenditure for 1992-93	Allocation for five years	Expenditure for five years

Source : P.R.

Appendix Table 6.1.9 Operating Revenue

(Rs. in million)

Year	Passenger Earnings	Luggage, Mails, etc. Earnings	Freight Earnings	Miscellanous Earnings	Total
1983-84	1,427.7	212.9	1,988.5	50.7	3,679.9
1984-85	1,425.4	168.0	1,972.7	115.0	3,681.1
1985-86	1,561.6	211.6	2,494.2	100.3	4,367.7
1986-87	1,586.2	250.3	2,794.0	80.0	4,710.5
1987-88	1,746.5	239.4	3,350.6	107.0	5,443.4
1988-89	1,860.6	257.9	3,109.2	80.2	5,307.9
1989-90	1,960.8	310.8	3,275.1	98.0	5,644.8
1990-91	3,353.8	298.0	2,962.1	146.9	6,760.8
1991-92	3,867.5	365.0	3,823.5	179.9	8,235.9
1992-93	4,134.7	474.2	4,286.7	135.4	9,031.0

Source : P.R. Year Book 1992-93

Appendix Table 6.1.10 Pakistan Railways : Operating Expenditures

(Rps.million)

Year	Repairs' and Maintenance	Fuel Costs	Stuff Costs	Admini-stration Costs	Other Costs	Total Operating Expenses'
1983-84	1,393.7	1,079.5	460.4	483.5	186.7	3,603.8
1984-85	1,627.3	1,098.5	463.1	483.9	195.4	3,868.2
1985-86	1,675.2	1,106.6	503.4	517.6	198.7	4,001.5
1986-87	1,822.6	940.0	532.9	570.7	210.2	4,076.4
1987-88	2,142.3	977.9	627.6	657.9	249.3	4,655.0
1988-89	2,278.9	952.7	647.9	703.3	305.6	4,888.3
1989-90	2,461.9	1,005.4	676.7	705.0	378.8	5,227.8
1990-91	2,601.3	1,185.4	799.3	818.5	424.2	5,828.7
1991-92	3,076.0	1,092.3	966.0	1,006.5	524.4	6,665.2
1992-93	3,090.4	1,090.7	1,005.7	1,071.2	588.2	6,846.1

Source : P.R.Year Book

Appendix Table 6.1.11 Main Line Capacity and Utilization

SECTION	TRACK	CAPAC-ITY	PASSENGER TRAIN		GOODS TRAIN		LIGHT ENGINE		TOTAL	
			UP	DOWN	UP	DOWN	UP	DOWN	UP	DOWN
KYC-KC	DL	67	28.0	28.0	13.0	15.0	3.0	4.0	44.0	47.0
KC -KOT	DL									
KOT-HDR	DL	72	21.0	21.0	13.0	12.0	3.0	3.0	37.0	36.0
HDR-TDM	DL	48	16.0	16.0	13.0	12.0			29.0	28.0
TDM-KPR	DL									
KPR-SMA	DL	29	14.0	14.0	10.1	9.5	0.2	0.6	24.3	24.1
SMA-LON	DL	26	22.0	22.0	10.2	9.0	0.8	0.5	33.0	31.5
LON-SSH	SL	17	13.0	13.0	3.8	3.6	0.4	0.5	17.2	17.1
SSH-MUL	SL	26	19.0	19.0	3.5	3.6	0.4	0.9	22.9	23.5
MUL-KWL	SL	17	15.0	15.0	3.4	3.4	1.0	1.2	19.4	19.6
LON-KWL	SL	17	4.0	4.0	6.1	6.2	0.3	0.5	10.4	10.7
KWL-SWAL	SL	20	12.0	12.0	5.8	5.1	0.4	0.8	18.2	17.9
SWAL-RND	SL	23								
RND-LHR	DL	50	20.0	20.0	5.0	5.0	1.0	1.0	26.0	26.0
LHR-SDR	DL	56	37.0	37.0	3.0	1.0	1.0	1.0	41.0	39.0
SDR-WZD	SL	22	12.0	12.0	2.0	2.0	1.0	1.0	15.0	15.0
WZD-LLM	SL	25	14.0	14.0	2.0	1.0	1.0	1.0	17.0	16.0
LLM-MNA	SL	23	14.0	14.0	4.0	3.0	2.0	3.0	20.0	20.0
MNA-CKL	SL	23	15.0	15.0	4.0	3.0	2.0	3.0	21.0	21.0
CKL-RWP	DL	53	15.0	15.0	3.0	1.0	4.0	3.0	22.0	19.0
RWP-GLR	DL	50	18.0	18.0	2.0	1.0	1.0	1.0	21.0	20.0
GLR-TXL	SL	21	16.0	16.0	2.0	2.0	1.0	1.0	19.0	19.0
TXL-ATCY	SL	19	6.0	6.0	4.0	2.0			10.0	8.0
ATCY-NSR	SL	17	7.0	7.0	8.0	6.0	2.0	1.0	17.0	14.0
NSR-PSC	SL	20	8.0	8.0	6.0	3.0	3.0	3.0	17.0	14.0
KWL-SKO	SL	20	7.0	7.0	3.6	3.5	0.5	0.5	11.1	11.0
SKO-FSLD	SL	36	9.0	9.0	3.1	2.6	1.0	1.0	13.1	12.6
FSLD-CKJ	SL	63	21.0	21.0	2.0	1.5	1.0	1.0	24.0	23.5
CKJ-SLL	SL	56	18.0	18.0	1.5	0.8	0.3	0.3	19.8	19.1
SLL-WZD	SL	32	7.0	7.0	1.2	0.5	1.0	1.0	9.2	8.5

Source : P.R.

Appendix Table 6.1.12 Locomotive Usage (Broad Gauge)

Year	Number of Locomotives				Coaching Vehicles km	Passenger Tonnes km		Engine-km per day			
	SL (No.)	DL (No.)	EL (No.)	Total (No.)	(No.)	(million)	(million)	SL	DL	EL	Total
1980-81	381	474	29	884	2,061	16,387.2	7,917.7	126	306	391	237
1981-82	380	488	29	897	2,116	16,501.7	7,066.8	131	301	358	235
1982-83	380	504	29	913	2,161	18,030.6	7,323.4	136	298	360	243
1983-84	356	492	29	877	2,201	18,287.1	7,384.9	141	293	305	241
1984-85	339	482	29	850	2,293	17,806.5	7,202.9	141	300	311	246
1985-86	278	512	29	819	2,515	16,849.6	8,269.8	140	295	287	247
1986-87	201	547	29	777	2,471	16,919.8	7,819.8	149	298	286	280
1987-88	137	566	29	732	2,500	18,542.5	8,033.2	137	314	274	287
1988-89	125	565	29	719	2,437	19,731.7	8,363.9	118	315	254	288
1989-90	121	564	29	714	2,314	20,373.3	7,226.3	113	353	298	296
1990-91	121	564	29	714	2,189	19,963.7	5,708.6	107	325	274	295
1991-92	121	563	29	713	2,285	18,158.0	5,961.6	127	327	220	306
1992-93	90	549	29	668	2,285	17,082.3	6,180.3	147	319	229	302

Source : P.R.Year Book 1992-93

Appendix Table 6.2.1 Pakistan Railways : Number of Diesel Locomotives (Broad Gauge)

Name	Rated Power (KW)	No. in Service	Year First Built	Year Re-engined	Type of Service
ALU-95	950	23	1958		Passenger/Shunting
ALU-12	1200	46	1962		Passenger/Shunting
ALU-18	1800	23	1961		Passenger/Freight
ALU-20	2000	52	1962		Passenger/Freight
ALU-24	2400	21	1967		Freight
GEU-15	1500	22	1970		Passenger
GEU-20	2000	19	1971		Freight
GMU-15	1500	32	1975		Passenger/Light Freight
GMU-30	3000	36	1975		Freight/Express
GMCU-15	1500	30	1979		Passenger/Light Freight
HAU-10	1000	4	1980		Shunting
HAU-20	2000	28	1982		Mail/Express
HPU-20	2000	10	1982		Freight
ARP-20	2000	23	1951	1977	Freight
ARU-20	2000	25	1952	1976	Freight
ARPW-20	2000	42	1957	1982	Passenger/Freight
ALU-20/R	2000	7	1961	1986	Freight
MGMU-30	3000	30	1985		Mail/Express/Freight
HBU-20	2000	60	1986		Mail/Express/Freight

Appendix Table 6.2.2 Type - Wise & Age - Wise Breakdown of Goods Stock on

Description of Stock	code	0-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	Above 45	Total
(4 Wheeled)												
1 Covered	C				540	3,700	3,500	4,390	1,272	1,077		14,479
2 Covered for Live Stock	CA					354	551	650	567			2,122
3 Covered for Cement	CWR						311					311
4 Explossive Van	X						15	5				20
5 High Sided Open Truck	KC					215	700	760	500	335		2,510
6 Low Sided Open Truck	KF					306	730	184	258	115		1,593
7 Ballast Truck	KW						50	100	16			166
8 Brake Van	V						168	200		30	15	413
9 Tank Wagon	TO			72	419	1,447	262	716	382			3,298
Total		0	0	72	959	6,022	6,287	7,005	2,995	1,557	15	24,912
(Bogie)												
10 Covered	BC					61	67					128
11 Covered for Live Stock	BCA					24						24
12 High Sided Open Truck	LKC						115	136		15		266
13 Low Sided Open Truck	BKF	125				59	315	20		55	12	586
14 Ballast Truck	BKW	101	373			75						549
15 Flat Truck	BFR					18	234	54	65	29	31	431
16 Flat truck for Military	MBFR				123		172					295
17 Crocodile Truck	BFU					6	5	8		2		21
18 Crocodile Truck for Military	MBFU									45		45
19 Tank Wagon	BTC	19		210	359	115	127	398				1,228
Total		245	373	210	482	358	1,035	616	65	146	43	3,573

Source : P.R.

Appendix Table 6.2.3 Type - Wise & Age - Wise Breakdown of Broad Gauge Coaching Stock on

	Type of Stock	0-5	6-10	11-15	16-20	21-25	26-30	31-35	Above 35	Total
1	A					10	19			29
2	AN						2	4		6
3	ANF								12	12
4	ZB	49	9							58
5	ZC, ZCD		9	9			4			22
6	N		36	65		10			11	122
7	NF, NFS, NS		5			27	43	15	4	94
8	F, FS, S	20	193	297	275	73	209	121	56	1,244
9	FDDH, SPPH, SPPQ		15			3		6		24
10	FLR, SLR	20	39	112	36		68	15	11	301
11	FD, FK		16	6	2	4	9	6		43
12	CDZ					3				3
13	FZ					96		35		131
14	Y, YR			66	17			18	1	102
15	FLRG	15								15
	Total	104	322	555	330	226	354	220	95	2,206

Source : P.R.

104	426	981	1311	1537	1891	2111	2206	

Appendix Table 6.3.1 Assigned Traffic Volume in the Year 1997-98, 2005-06

AMode	BMode	1993 Tons	1993 Ton-kms	1993 Pax	1993 Pax-kms	1998 Tons	1998 Ton-kms	1998 Pax	1998 Pax-kms	2006 Tons	2006 Ton-kms	2006 Pax	2006 Pax-kms
39	101	8,384	724	24,731	2,355	27,895	2,273	35,929	3,415	45,596	3,716	61,276	5,824
101	102	13,460	1,110	25,751	2,477	30,093	2,482	36,084	3,558	48,070	3,965	62,368	6,000
102	33	13,437	120	25,259	263	30,093	269	36,171	377	48,070	430	60,766	634
33	104	14,204	762	29,211	1,823	32,165	1,726	41,151	2,575	50,316	2,711	67,431	4,220
104	31	14,224	862	28,971	2,048	32,693	1,982	40,801	2,885	51,221	3,105	66,848	4,726
31	32	14,404	2,262	29,563	5,403	32,811	5,153	41,372	7,576	51,368	8,067	67,385	12,340
32	29	14,400	358	32,609	945	32,799	815	45,652	1,323	51,333	1,275	73,960	2,143
29	27	13,833	2,370	28,763	5,767	32,639	5,616	40,058	8,032	50,673	8,713	64,825	12,998
27	25	13,760	2,421	24,233	4,971	32,660	5,748	33,335	6,838	50,650	8,910	53,011	10,875
25	106	13,747	205	24,089	419	32,566	486	33,143	576	50,505	753	52,734	917
106	22	6,932	496	9,318	778	19,673	1,408	12,557	1,048	30,254	2,165	18,954	1,582
22	23	5,048	75	20,798	362	13,253	198	28,610	497	20,667	308	43,798	761
23	108	2,974	145	2,880	164	8,762	427	9,397	534	13,094	667	13,841	786
108	24	5,973	707	10,198	1,407	11,604	1,372	10,010	1,381	18,084	2,139	16,191	2,233
24	110	5,786	730	9,976	1,468	10,221	1,290	9,752	1,435	17,673	2,231	15,905	2,341
110	17	7,232	288	14,252	661	15,971	635	19,903	923	25,399	1,010	32,460	1,505
17	111	4,158	29	56,548	459	6,016	42	78,039	633	8,860	62	124,269	1,008
111	19	3,519	210	11,690	813	4,902	292	15,776	1,097	7,113	424	24,563	1,708
19	118	3,609	115	10,025	372	4,272	136	13,529	502	6,206	197	21,153	785
118	12	3,096	43	9,345	152	3,876	54	12,641	205	5,689	79	19,302	321
12	11	2,908	153	9,201	565	3,913	206	12,504	768	5,736	302	19,699	1,210
11	10	2,909	240	8,175	786	3,336	275	11,230	1,080	4,937	407	17,981	1,730
10	119	2,909	116	8,175	379	3,336	133	11,230	521	4,937	196	17,981	834
120	10	1,036	33	5,554	206	767	24	7,275	270	921	29	10,548	391
9	120	503	25	5,170	300	426	21	6,738	390	555	28	9,708	563
9	124	2,611	125	6,224	346	5,205	248	8,163	454	3,195	152	11,932	664
2	124	1,482	57	1,218	55	2,894	112	1,644	74	4,357	168	2,577	116
106	108	3,254	294	11,299	1,192	7,024	635	11,399	1,202	14,987	1,355	18,258	1,926
28	29	2,358	77	10,529	403	4,448	146	14,076	538	6,342	208	21,281	814
28	105	1,779	90	11,915	704	4,372	222	15,769	932	6,234	316	23,499	1,389
105	45	1,281	199	5,071	917	4,324	670	6,372	1,152	6,177	958	8,937	1,616
45	126	953	111	4,821	654	3,966	461	5,976	816	5,679	660	8,206	1,113
126	40	959	23	4,383	136	3,915	93	6,080	169	5,610	134	8,496	234
102	34	31	6	1,416	297	0	0	2,053	431	0	0	3,432	720
34	30	2	0	1,648	197	2	0	2,152	257	3	0	3,118	372
30	28	615	39	5,248	383	34	5	6,859	501	120	8	9,926	725
33	103	127	8	2,378	185	498	33	3,578	278	664	44	6,333	492
33	38	18	2	26	3	37	4	31	4	40	4	41	5
105	107	43	18	430	213	96	41	541	268	113	50	747	371
107	22	7,072	401	14,368	949	6,458	366	19,999	1,321	9,635	546	31,132	2,057
25	26	21	4	356	76	94	17	478	101	145	26	727	154
106	110	1,446	533	4,276	1,838	2,555	942	4,180	1,797	4,418	1,629	6,817	2,931
107	14	2,716	664	1,602	457	5,762	1,409	2,163	617	8,478	2,073	3,349	955
14	125	5,082	104	2,066	81	5,762	195	2,780	110	8,478	286	4,264	168
125	123	2,480	219	1,539	158	5,047	446	2,073	214	7,422	657	3,253	336
123	9	2,369	134	1,688	112	4,801	272	2,284	151	7,088	492	3,569	236
108	109	3,116	195	8,261	603	4,183	262	10,790	788	6,180	387	15,916	1,162
109	15	2,644	281	8,496	1,054	3,244	345	10,865	1,347	4,709	501	15,483	1,920
15	112	871	22	17,645	511	1,029	26	21,797	632	1,606	40	29,545	856
112	113	897	22	14,421	418	1,029	26	18,194	527	1,606	40	25,177	730
118	113	173	19	963	124	43	5	1,168	150	49	5	1,545	199
109	115	342	50	2,643	450	614	90	3,644	621	965	141	5,655	963
13	115	476	9	6,365	148	614	12	7,935	184	965	19	11,115	258
13	117	296	22	1,046	90	37	3	1,355	116	47	3	1,959	168
12	117	296	27	1,046	112	37	3	1,355	144	47	4	1,959	209
111	18	217	7	42,434	1,623	12	0	58,423	2,235	16	1	92,487	3,537
113	18	724	42	15,458	905	986	57	17,026	1,145	1,557	90	23,634	1,589
112	115	148	10	4,342	342	0	0	5,155	406	0	0	6,838	539
13	116	366	17	464	25	0	0	617	33	0	0	915	49
14	116	366	36	464	54	0	0	617	72	0	0	915	106
111	114	422	33	2,424	222	1,102	87	3,840	352	1,731	136	7,210	660
118	20	151	6	3,992	199	675	29	5,075	253	958	41	7,093	353
120	121	573	47	580	56	341	28	793	76	366	30	1,204	116
10	122	251	22	594	62	22	2	807	84	30	3	1,261	132
123	3	459	28	200	14	290	18	261	18	394	24	394	28
124	1	837	29	586	24	1,321	53	750	30	2,186	76	1,017	41
1	127	461	19	10	0	262	11	14	1	342	14	22	1
126	42	116	37	66	24	95	30	110	41	117	37	214	79
42	51	75	29	0	0	60	23	0	0	70	27	0	0
TOTAL ('000 per day)			18,727		51,760		40,487		69,076		63,187		109,519
TOTAL (million per year)			6,180		17,081		13,361		22,795		20,852		36,141

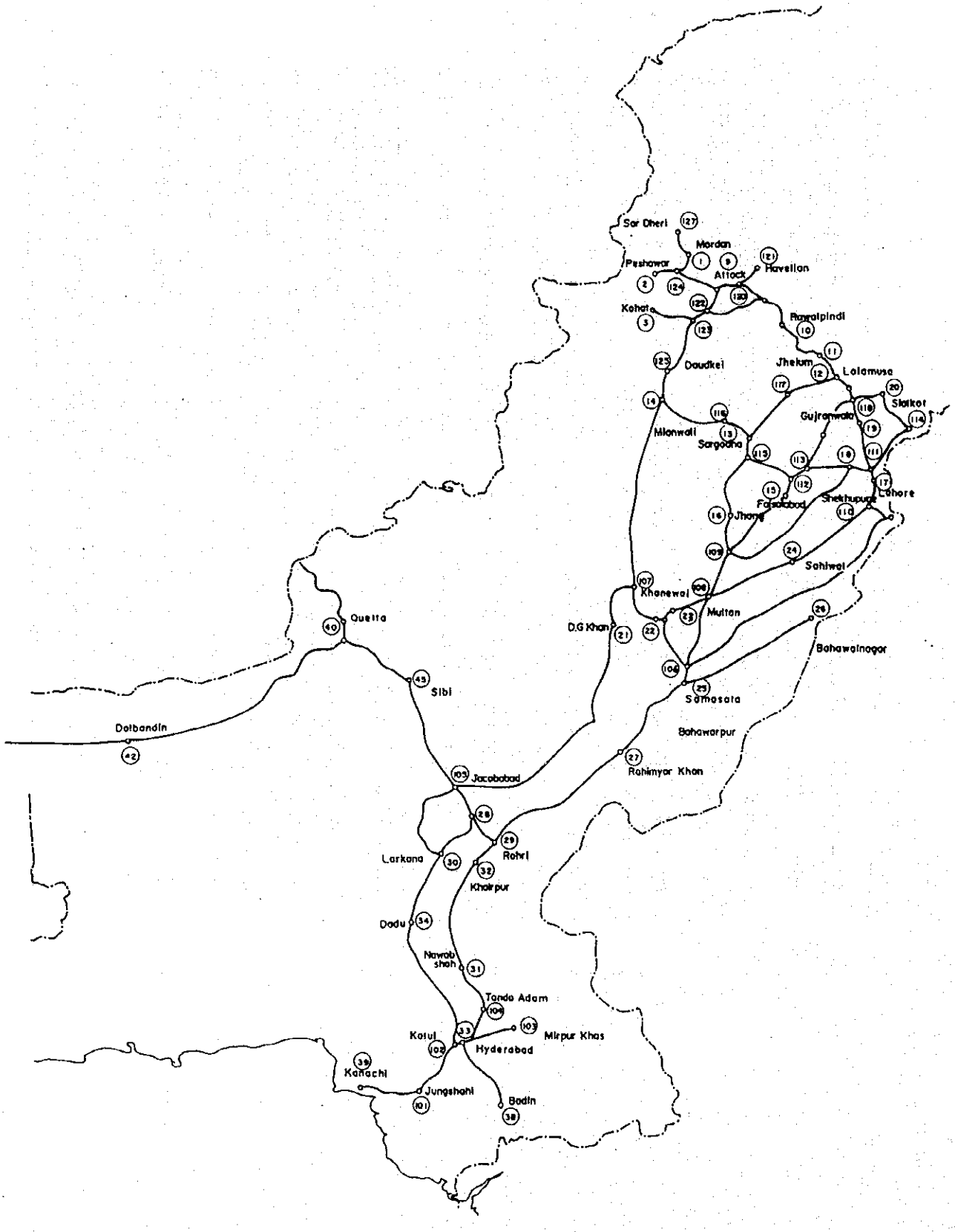
Appendix Table 6.3.2 Necessary Train No. in the year 1997-98, 2005-06

ANode	BNode	1998 TonsAB	1998 TonsBA	1998 PaxAB	1998 PaxBA	1998 Nf	1998 Tra-km(f)	1998 Np	1998 Tra-km(p)	1998 No. of Train
39	101	11,823	16,072	18,205	17,724	16	2,636	18	2,963	34
101	102	13,325	16,768	18,750	18,234	17	2,783	19	3,084	35
102	33	13,325	16,768	18,375	17,796	17	302	22	400	39
33	104	13,947	18,218	21,522	19,629	18	1,968	22	2,395	40
104	31	14,030	18,663	21,356	19,445	19	2,277	21	2,565	40
31	32	14,114	18,697	21,625	19,747	19	5,908	21	6,722	40
32	29	14,116	18,674	23,739	21,913	19	934	23	1,163	42
29	27	13,611	19,048	20,285	19,773	19	6,591	20	6,926	39
27	25	13,506	19,154	17,145	16,190	19	6,781	17	6,044	36
25	106	13,412	19,154	17,055	16,088	19	575	17	510	36
106	22	4,917	6,241	6,588	5,969	6	899	7	1,033	13
22	23	2,003	2,735	14,622	13,988	3	82	19	561	21
23	108	34	213	5,634	3,763	0	21	6	616	6
108	24	11,091	6,263	9,183	10,978	11	2,640	12	2,925	23
24	110	10,448	5,523	9,668	10,235	10	2,654	12	2,945	22
110	17	5,523	10,448	10,235	9,668	10	836	15	1,168	25
17	111	4,283	1,733	38,880	39,159	7	100	54	752	61
111	19	1,493	3,499	8,536	7,240	6	760	10	1,200	16
19	118	1,195	3,077	7,408	6,121	5	328	9	572	14
118	12	979	2,897	6,019	6,622	5	135	8	230	13
12	11	981	2,932	6,316	6,188	5	518	8	840	13
11	10	846	2,490	5,688	5,542	4	689	7	1,217	11
10	119	846	2,490	5,688	5,542	4	332	7	587	11
120	10	307	460	3,668	3,607	1	49	10	613	10
9	120	34	392	3,399	3,339	1	65	8	825	9
9	124	1,712	3,493	4,268	3,895	6	559	9	896	15
2	124	1,936	958	587	1,057	3	252	5	415	9
106	108	8,345	12,945	11,064	10,486	13	2,356	14	2,517	27
28	29	2,804	1,644	6,846	7,230	3	185	11	728	14
28	105	2,801	1,571	7,765	8,004	3	286	12	1,225	15
105	45	2,763	1,561	3,091	3,281	3	862	6	1,904	9
45	126	2,542	1,424	2,890	3,086	8	1,983	5	1,137	13
126	40	2,511	1,404	2,942	3,138	8	402	4	188	12
102	34	9	0	995	1,058	0	0	2	841	2
34	30	2	0	1,099	1,093	0	0	3	695	3
30	28	77	7	3,502	3,357	0	10	4	552	4
33	103	445	53	1,759	1,819	0	60	4	573	5
33	38	37	0	16	15	0	7	1	204	1
38	105	0	0	0	0	0	0	2	544	2
105	107	52	44	263	278	0	89	1	1,153	1
107	22	3,525	2,933	10,007	9,992	7	804	17	1,882	24
25	26	94	0	233	245	0	34	1	478	1
106	110	0	0	0	0	0	0	2	1,484	2
107	14	3,560	2,202	919	1,244	7	3,503	4	1,749	11
14	125	2,202	3,560	1,562	1,218	7	484	5	337	12
125	123	1,815	3,232	1,190	883	6	1,151	4	799	11
123	9	1,700	3,101	1,297	987	6	707	5	527	11
108	109	2,116	2,067	5,722	5,068	4	444	8	1,027	12
109	15	1,443	1,801	6,021	4,544	3	642	10	2,039	13
15	112	404	625	8,848	12,949	1	52	26	1,309	27
112	113	404	625	9,143	9,051	1	52	19	971	20
118	113	43	0	657	511	0	16	4	348	4
109	115	328	286	1,618	2,026	1	193	6	1,627	6
13	115	286	328	6,268	1,667	1	26	13	513	13
13	117	35	2	312	1,043	0	10	5	785	5
12	117	35	2	312	1,043	0	13	5	976	5
111	18	12	0	29,255	29,168	0	1	45	2,942	45
109	18	0	0	0	0	0	0	3	1,326	3
113	18	582	404	8,394	8,632	1	113	16	1,832	17
112	115	0	0	4,674	481	0	0	8	1,067	8
13	116	0	0	318	299	0	0	2	221	2
14	116	0	0	318	299	0	0	2	480	2
111	114	0	0	0	0	0	0	7	1,106	7
118	20	209	466	2,469	2,606	1	67	8	710	9
116	117	0	0	0	0	0	0	3	570	3
120	121	273	68	397	396	1	91	1	248	2
10	122	22	0	402	405	0	8	3	451	3
123	3	137	153	129	132	0	37	2	264	2
124	1	635	886	378	372	2	124	2	173	4
1	127	262	0	7	7	1	44	1	85	2
126	42	53	42	55	55	0	113	1	682	1
42	51	30	24	0	0	0	93	1	778	1

ANode	BNode	2006 TonsAB	2006 TonsBA	2006 PaxAB	2006 PaxBA	2006 Nf	2006 Tra-km(f)	2006 Np	2006 Tra-km(p)	2006 No. of Train
19,458	26,138	31,079	30,197	26	4,287	30	4,942	56		
21,139	26,931	31,646	30,722	27	4,471	31	5,091	58		
21,139	26,931	30,901	29,865	27	485	34	611	61		
21,873	28,643	35,092	32,339	29	3,093	35	3,769	64		
21,985	29,236	34,829	32,019	29	3,567	34	4,196	63		
22,090	29,278	35,081	32,304	29	9,252	34	10,709	63		
22,093	29,240	38,330	35,630	29	1,462	37	1,847	66		
21,181	29,492	32,773	32,052	29	10,204	32	10,977	61		
21,010	29,640	27,222	25,789	30	10,493	27	9,388	56		
20,865	29,640	27,088	25,646	30	889	26	792	56		
7,520	9,355	10,003	8,951	9	1,347	10	1,494	20		
3,220	4,068	22,398	21,400	4	122	26	780	30		
44	271	8,162	5,679	0	27	9	848	9		
17,535	10,047	15,004	17,742	18	4,173	19	4,435	36		
16,541	8,858	15,857	16,603	17	4,201	18	4,462	34		
8,858	16,541	16,603	15,857	17	1,323	21	1,645	37		
6,398	2,462	62,019	62,241	11	149	75	1,055	86		
1,950	5,163	13,302	11,261	9	1,033	14	1,736	23		
1,649	4,557	11,590	9,563	8	486	13	823	20		
1,345	4,344	9,556	10,246	7	203	12	325	19		
1,347	4,389	10,026	9,673	7	775	11	1,208	19		
1,163	3,774	9,183	8,798	6	1,044	11	1,761	17		
1,163	3,774	9,183	8,798	6	503	11	849	17		
341	580	5,332	5,216	1	62	12	747	13		
44	511	4,911	4,797	1	85	10	1,014	11		
2,391	5,222	6,289	5,643	9	836	12	1,139	21		
2,973	1,364	905	1,672	5	386	6	475	11		
13,104	20,343	17,800	17,013	20	3,702	22	4,050	43		
3,977	2,365	10,370	10,911	4	262	16	1,032	20		
3,973	2,261	11,586	11,913	4	405	17	1,723	21		
3,922	2,255	4,344	4,593	4	1,224	8	2,415	12		
3,610	2,069	3,973	4,233	12	2,816	6	1,472	18		
3,570	2,040	4,072	4,334	12	571	5	260	17		
0	0	1,660	1,772	0	0	3	1,164	3		
3	0	1,590	1,528	0	1	4	821	4		
110	10	5,070	4,856	0	14	6	799	6		
593	71	3,111	3,222	1	79	6	808	7		
40	0	21	20	0	8	1	205	1		
0	0	0	0	0	0	2	544	2		
66	52	364	383	0	113	1	1,266	2		
5,311	4,324	15,539	15,593	11	1,211	23	2,678	34		
145	0	359	368	0	53	1	534	2		
0	0	0	0	0	0	2	1,484	2		
5,350	3,128	1,399	1,950	11	5,264	4	2,183	15		
3,128	5,350	2,419	1,845	11	728	6	410	17		
2,523	4,899	1,887	1,366	10	1,744	5	954	15		
2,377	4,711	2,048	1,521	9	1,074	6	634	15		
3,101	3,079	8,224	7,092	5	651	11	1,421	16		
2,050	2,659	8,433	7,050	4	948	13	2,684	17		
622	984	12,072	17,473	2	82	32	1,592	33		
622	984	12,581	12,596	2	82	24	1,187	25		
49	0	875	668	0	18	4	909	4		
519	446	2,494	3,161	1	305	7	2,044	8		
446	519	8,584	2,531	1	42	16	629	17		
45	2	458	1,501	0	13	6	870	6		
45	2	458	1,501	0	17	6	1,081	6		
16	0	46,356	46,131	0	2	66	4,352	66		
0	0	0	0	0	0	3	1,326	3		
935	622	11,721	11,913	2	181	20	2,307	21		
0	0	6,112	726	0	0	10	1,311	10		
0	0	469	446	0	0	3	238	3		
0	0	469	446	0	0	3	517	3		
0	0	0	0	0	0	7	1,106	7		
302	656	3,450	3,643	1	94	10	822	11		
0	0	0	0	0	0	3	570	3		
297	69	603	601	1	99	2	291	2		
30	0	628	633	0	11	3	502	3		
176	218	194	200	0	53	2	275	3		
855	1,331	512	505	3	186	3	185	5		
342	0	11	11	1	57	1	85	2		
64	53	108	106	0	136	1	724	1		
43	27	0	0	0	112	1	778	1		

Appendix Figure 6.3.1 No. of Railway Station Code

(ⓝ : Station Code)



Appendix 6.3.3 Process of Calculation the No. of Trains and Rolling Stock

1. Calculating the No. of Trains

(a) In Case of Passenger Trains:
The formula for calculating the No. of Trains is shown below:

$N_{P1} = V/C \times 0.7$

where: N_{p1}: No. of trains
V: Assigned traffic volume (one way)
0.7: Conversion factor for the assigned traffic volume
C: Main lines 1200, others 900

(b) In Case of Freight Trains:
The formula for calculating the necessary No. of trains is shown below:

$N_F = W / TxE \times 1.2$

where: N_F: No. of trains
W: Freight traffic volume (one way)
T: Section-wise tractive capacity per engine
(2000 t, 1200 t, 1000 t, 600 t)
E: 0.7 (loading capacity ratio in case of 25% vacant car ratio)
1.2: Coefficient of undulation.

2. Calculating the No. of Locomotives

(a) In Case of Passenger Trains:

1) Calculation of Train–kms (T.K)
Average No. of trains by section (NP_2) = Necessary No. of trains NP (NP_1) + No. of existing ordinary trains

$T.K = NP_2 \times$ Section distance x 2

2) Calculating the Necessary No. of Locomotives
No. of locomotives = Train-kms + engine-kms x spare ratio (1.15).
The way of thinking about engine-kms is described in section 3.

(b) In Case of Freight Tains:

1) Calculation of train-kms (T.K)

T.K. = Necessary No. of trains (NF) x Section distance x 2.

2) Calculating the necessary No. of Locomotives.
Same as for passenger trains.

3) Calculating the total necessary No. of D.E.L.
The total necessary number of D.E.L. includes the No. of D.E.L. for shunting and pilot in 2005-06.

Necessary No. of D.E.L. (for shunting and pilot)
= (No. of E.L. + No. of D.E.L) x 0.3

This coefficient (0.3) indicates the ratio of the No. of D.E.L. for shunting and pilot to the total No. of D.E.L. for freight based on actual results in 1992–93.
However, half of these should be replaced with wagon movers.

3. Engine-Kms in the Future

(1) Engine-Kms for E.L.
Regarding engine-kms for E.L., since operating conditions have deteriorated in recent years, the same values as the previous study were used.

Engine-kms for E.L.	1997–98	2005–06
Goods	300	360
Passenger	570	680

(2) Engine-Kms for D.E.L.
According to the 1992-93 yearbook, D.E.L. showed the highest performance in 1989-90 with 240 engine-kms for freight transport and 353 engine-kms overall. Accordingly, engine-kms for passenger transport are calculated as follows using the 1989-90 figures.

Engine-Km for D.E.L for passenger = 32,727/(193 x 365)
= 465
= 470 km/day

where:
32,727 : Train-Kms in 1989–90
193 : Assigned No. of D.E.L. for passenger transport

Therefore, assuming like the previous study that efficiency can be raised by 20% by 2005-06, the engine-kms for D.E.L. can be determined as follows.

Engine-kms for D.E.L.	1997–98	2005–06
Goods	240	290
Passenger	470	560

Efficiency in the section between Sibi and Quetta is decreased by about 20% due to the steep grade.
When calculating the number of trains, this section needs two locomotives for transport. This is considered to decrease the efficiency by about 40% for the calculations.

4. Calculating the No. of Wagons and Carriages
As stated in 7.1.7, the average ton-kms per wagon and average passenger-kms per carriage are as follows.
Average ton-kms per wagon: 848,000
Average passenger-kms per carriage: 7,270,000

calculations of the No. of Wagons and Carriages are based on the assumption that these figures are directly proportional to ton-kms and passenger-kms respectively.

Appendix 6.3.4 Measures for High - Speed Operation

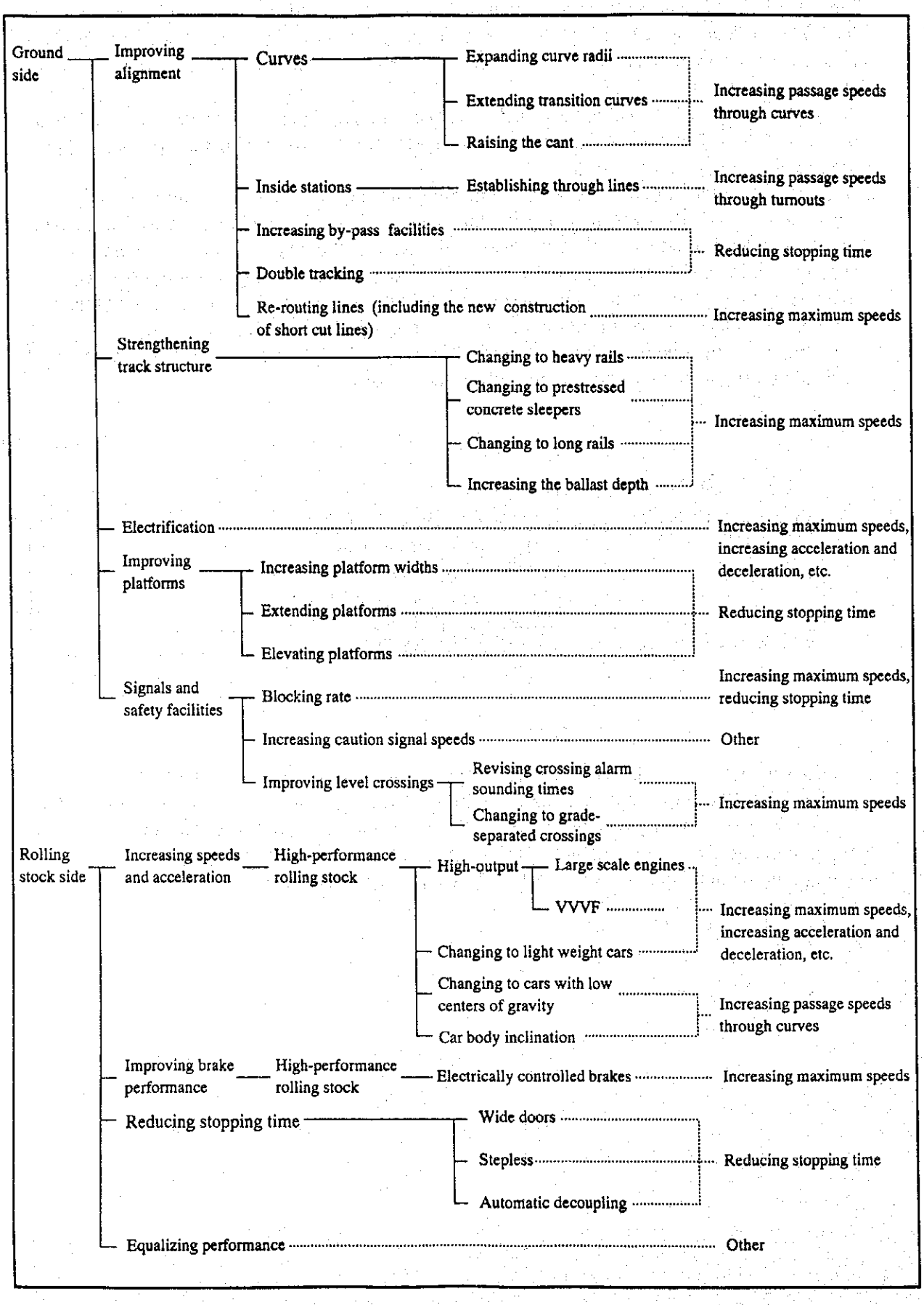
Since the Pakistan Railways set forth measures to increase speeds to 160 km/h in the 8th Five-Year Plan, in consideration of P.R.'s current competitiveness against air and road transport, these measures are indispensable not only to meet the needs of the people but also in terms of P.R.'s management strategy.
As shown in Table 1, reducing the transfer distance, increasing operating speeds and reducing time losses have been raised as measures to increase train speeds, or in other words to reduce the actual running time of trains.
Reducing the transfer distance consists of establishing short circuit routes. However, in consideration of P.R.'s existing network, constructing new lines would not be advisable, and devising measures to increase speeds on existing routes is thought to be more realistic.
Measures to increase operating speeds can be classified into increasing maximum speeds, increasing passage speeds through curves, increasing passage speeds through turnouts inside stations, and increasing acceleration, etc. In addition, reducing time losses by reducing stopping time, etc. could also be considered. The figure shows a menu of these measures divided and organized into ground and rolling stock sides.

Table 1 Determining factors for speed attainment

Reduce the transfer distance	(1) Establish short circuit routes
Increase operating speeds	(2) Increase maximum speed (3) Increase passage speeds through curves (4) Increase passage speeds through turnouts (5) Increase acceleration and deceleration
Reduce time losses	(6) Reduce stopping time

Various techniques can be used to increase speeds on existing lines according to the topography, alignment and other characteristics of the line, as well as the speeds which you are attempting to reach. In Japan, the contents of measures are classified as shown in Table 2, and maximum speeds are reached by combining these techniques as necessary. However, increasing the maximum speed to 160 km/h is still in the experimental stages.

Appendix Figure 6.3.4.1 Example of Menu of Measures to Increase Speeds



Appendix Table 6.3.4.2 Outlined Contents of Measures to Increase Speeds

Maximum speed/Measure	130 km/h (including 140 km/h in some sections)	160 km/h
(1) Expanding curve radii	*Based on present roadbeds, curves with radii of approximately 600 m or less will be expanded at locations where work to improve the alignment is assumed to be relatively easy. However, tunnel entrances will also be improved for curves which lie between tunnels.	
(2) Raising the cant, extending the transition length	*Passage speeds through curves will be increased in accordance with the rolling stock introduced. Cants will be raised and transition lengths extended correspondingly.	
(3) Improvements inside stations	*Changing track layouts. For small-scale improvements, setting up through lines; for large-scale improvements, constructing refuge tracks, etc.	
(4) Double tracking	*Double tracking sections which contain single and double lines in the same section.	
(5) Re-routing lines	*Newly constructing short cut lines in areas with large detours or where S-curves are mixed. Short circuits should basically be constructed between stations. However, when this will not yield sufficient time reduction effects, large-scale short cut lines which do not pass through existing stations should be newly constructed.	
(6) Improving turnouts	*Upgrading to flexible turnouts.	*In addition to upgrading to flexible turnouts, crossing sections should be replaced to deal with high-speed operation.

(7) Strengthening the tracks	*Changing to prestressed concrete sleepers, increasing the number of sleepers, changing to heavy rails, and changing to long rails.	*In addition to the measures listed to the left, increasing the ballast depth. Also, a reinforced track structure is assumed for curved sections.
(8) Electrification	-	*Electrifying non-electrified sections. (Some lines should be left non-electrified.)
(9) Improving overhead lines	*Transferring overhead lines by inclining the body of pendulum cars	*In addition to the measures listed to the left, upgrading to high-tensile composite heavy simple overhead lines.
(10) Improving signal and safety facilities	*Improving views of signal devices; shifting the automatic train stopping wayside coils. *Revising crossing alarm sounding times to improve crossing control.	*Introducing new signal systems such as car-mounted signal systems or new automatic train stopping devices, etc. as necessary. *In addition to revising crossing alarm sounding times to improve crossing control, installing obstruction detectors and other devices at crossings.
(11) Improving rolling stock, introducing new cars	*Improving current rolling stock or introducing new cars (controlled pendulum cars, etc.) in accordance with increasing maximum speeds and passage speeds through curves.	

Appendix Table 6.4.1 List of Projects and Cost Estimation

(Rs. Million)

No.	Name of Projects	Estimated Cost (Total)	1993-94	1994-95	1995-96	1996-97	1997-98	Total 1993-98	beyond 1998	Ranking
1.	Signalling (Auto Block)	2,220			180	180	180	540	1,680	B
2.	Signalling (Interlock)	2,340			240	240	240	720	1,620	B
3.	Signalling (Tokenless)	1,630						0	1,630	C
4.	CTC System	1,100			100	100	100	300	800	C
5.	Track Renewal	7,120	710	710	710	710	710	3,550	3,570	A
6.	Electrification	17,420			120	120	120	360	17,060	C
7.	Double Tracking	7,760		1,000	1,000	1,000	1,000	4,000	3,760	B
8.	Upgrading KYC-LLM section	5,500			1,100	1,100	1,100	3,300	2,200	C
9.	Procurement of EL	3,300						0	3,300	C
10.	Revamping of EL	1,050		200	200	200	200	800	250	A
11.	Procurement of DEL	40,300	300	500	1,100	3,100	1,900	6,900	33,400	A
12.	Rehabilitation of DEL	3,000	600	600	600	600	600	3,000	0	A
13.	Traction Motor	500	100	100	100	100	100	500	0	A
14.	Wagon Movers	4,700					300	300	4,400	B
15.	Procurement of Wagons	13,000		1,100	1,100	1,100	1,100	4,400	8,600	B
16.	Replacement of Coaches	13,700		1,100	1,100	1,100	1,100	4,400	9,300	B
17.	Fittment of Air Brakes	1,000	200	200	200	200	200	1,000	0	A
18.	Roller Bearings	1,000	200	200	200	200	200	1,000	0	A
19.	Air Conditioning	1,000	200	200	200	200	200	1,000	0	B
20.	Dry Port	2,400						0	2,400	C
21.	M.I.S.	330	60	60	70	70	70	330	0	A
22.	Communication System	1,900		120	250	200	30	600	1,300	B
23.	Misc. & Minor Projects	13,330	237	609	857	1,052	945	3,700	9,630	
	TOTAL	145,600	2,607	6,699	9,427	11,572	10,395	40,700	104,900	

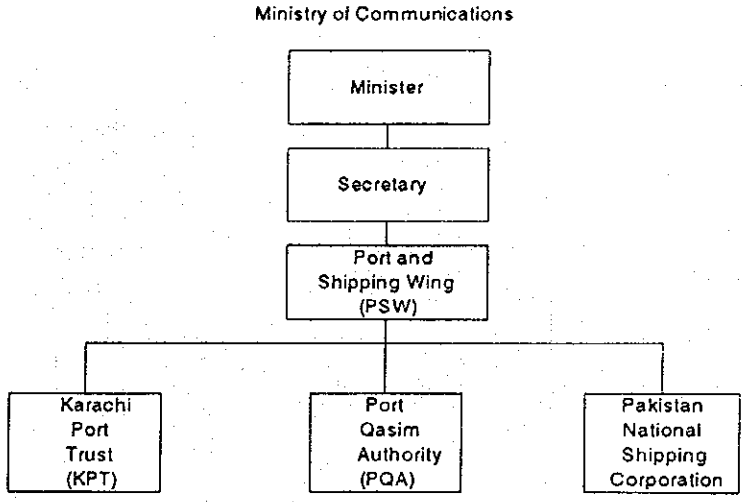
Appendix Table 6.5.1 Efficiency of Railways in Comparison with Some Countries

Subject	unit	PAKISTAN		INDIA	TURKEY	IRAN	UK	JAPAN
		(Broad Gauge)						
Route-kms	km	8,775	7,718	62,458	8,430	4,847	16,528	20,254
Electrified-kms	km	293	293	10,653	905	149	4,910	11,853
Electrified Ratio	%	3.3	3.8	17.1	10.7	3.1	29.7	58.5
Double Tracked-kms	km	1,037	1,037	14,605	189	0	11,618	8,207
Double-Tracked Ratio	%	11.8	13.4	23.4	2.2	0.0	70.3	40.5
No. of Locomotives	NO.	703	668	8,268	763	482	1,991	1,787
	(per km)	0.08	0.09	0.13	0.09	0.10	0.12	0.09
No. of Coaches	NO.	2,832	2,655	33,440	1,524	800	11,184	25,913
	(per km)	0.32	0.34	0.54	0.18	0.17	0.68	1.28
No. of Wagons	NO.	29,451	28,547	334,653	19,847	11,983	15,912	17,493
	(per km)	3.4	3.7	5.4	2.4	2.5	1.0	0.9
Train-kms per day			148,296	770,292	47,851	26,366	124,752	221,595
Train-kms per day	(per D.L.)		222	255	172	150	172	340
Passenger-kms	million	17,082		314,564	6,259	5,299	31,718	249,603
(pass./day/km)	'000	5.3		13.8	2.0	3.0	5.3	33.8
Pass.-kms/Coach	'000	6,032		9,407	4,107	6,624	2,836	9,632
Ton-kms	million	6,180		256,895	8,379	8,002	15,508	26,241
(ton/day/km)	'000	1.9		11.3	2.7	4.5	2.6	3.5
Ton-kms/Wagon	'000	210		768	422	668	975	1,500
No. of Employees	NO.	122,397		1,654,066	35,440	46,469	137,729	193,196
	(per km)	13.9		26.5	4.2	9.6	8.3	9.5

Source : P.R.Yaer Book & U.I.C (1992)

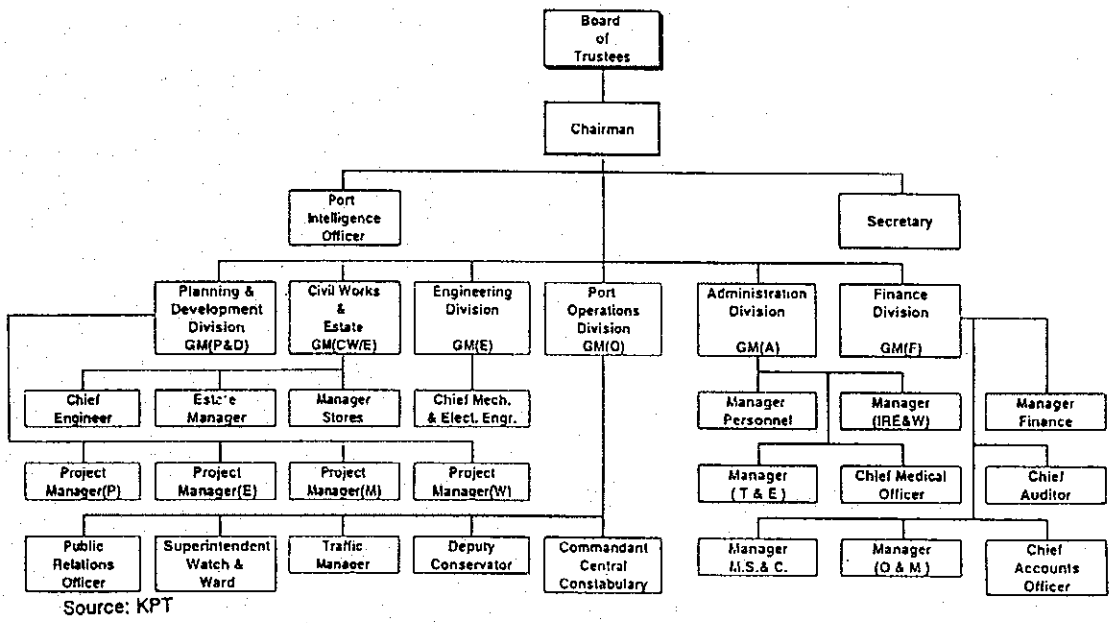
APPENDICES for CHAPTER 7

Appendix Table 7.3.1.1 Port and Shipping Administrative Organization



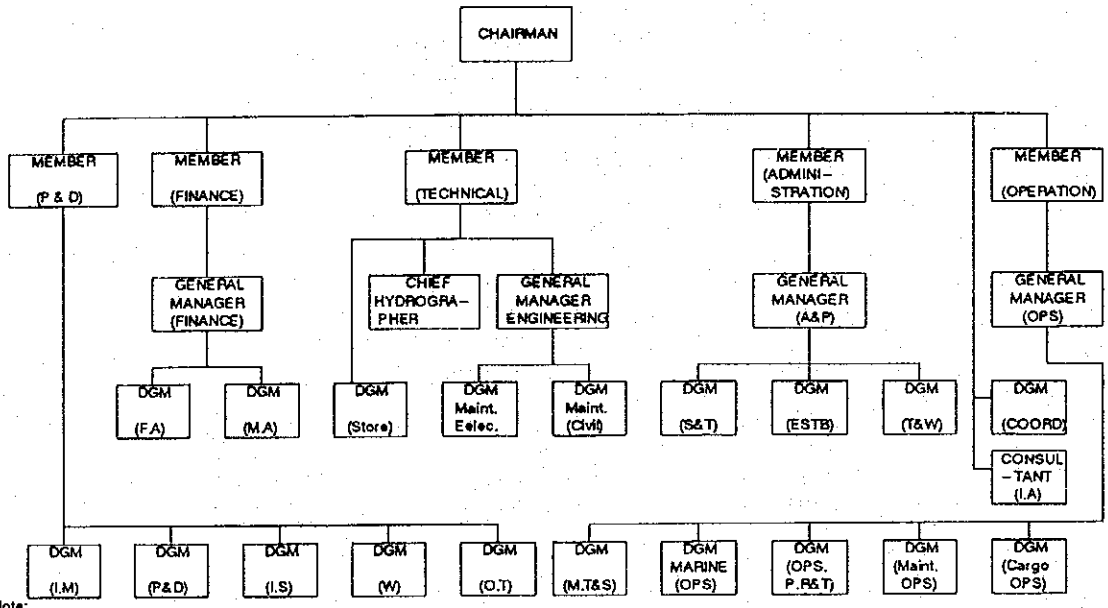
Source: PSW

Appendix Table 7.3.2.1 Organization Chart of Karachi Port Trust



Source: KPT

Appendix Table 7.3.3.1 Organization Chart of Port Qasim Authority



Note;

P&D: Port Development Division
A&P: Administration & Personnel
MAINT.OPS: Maintenance Operation
CARGO OPS: Cargo Operation
OPS: Operation
COORD; Chief Coordination

DGM: Deputy General Manager
P&D: Planning & Development
MAINT:Maintenance
FA: Financial Account
MA: Management Accounts
T&W: Transport & Welfare

ESTE: Estsblishment
IA: Internal Audit
MT&S: Marifme, Triff & Statistics
OPS PR&T: Operafonal, Planning, Research & Trainning
I.M: Industrial Management

I.S: Infrastructure
W: Works
O.T: Oil Terminal
S.T: Security & Transport

Source: PQA

Appendix Table 7.4.2.1 Cargo Handling Equipment at Karachi Port

Kind of Equipment	Purchase Year	Capacity (ton)	Manufact -urer	No. of Units	Working Condition		
					Good	Norm	Bad
Shunting Tractor	1972	4 cylinders	Ford England	7		6	1
Shunting Tractor	1972	2 cylinders	Ford England	2			2
Forklift	1976/79/81	2.5	BKC	43		18	25
Towing Unit	1972/1975			84		30	54
Truck	1970/88/93		Bedford Hino	28	6	11	11
Trolley	1980-83	3.0		346		144	202
Trolley	1980-84	5.0		68		33	35
Crane							
KL-77	1967	6.0	JONE England	16		Replecement required	
KL-77	1967	6.0	JONE England	15		Replecement required	
KL-77	1978	6.0	JONE England	14	14		
NL-250	1962	10.0	England	2		Replecement required	
COLES	1975	6.0	England	3		3	
NL-1092	1976	6.0	Holland	14		14	
Quay Crane(Electric)							
(A)	1972	3.0	CMI Italy	32	23		9
(B)	1964	3.0	S&P England	4		4	
(C)	1957-58	3.0	German	39			39
	1960-61	30.0	Applevage England	1			1
	1983	40.0	Boomse Belgiam	1	1		
Total				77	24	4	49

Source: KPT

Appendix Table 7.4.2.2 Harbour Crafts at Karachi Port

Kind of Craft and Name	Year of Built	Engine Screw	Bollard (tons)	Horse Power	Speed (knots)	Remarks
Shipping Tug						
FIRDOUSI	1959	Single	18	1,500	11.0	
PURJOSH	1962	Twin	19	1,500	11.0	
BAHADUR	1978	Twin	26	2 x 1,100	11.0	
SOHRAB	1983	Twin	35	2 x 1,100	11.9	
SIDBAD	1986	V.S.P	35	2 x 1,565	12.0	
SHANAWAR	1986	V.S.P	35	2 x 1,565	12.0	
Harbour Tug						
TANOMAND	1960	Single	3	265	10.5	
ZORAWAR	1960	Single	3	265	10.5	Non-operat.
CAHBUK	1970	Single	3.5	320	10.0	
TAWANA	1970	Single	3.5	320	10.0	Non-operat.
Floating Crane						
HATHI	1966	Twin		1,340	5.0	
PEELTAN	1963/64	Twin		900	10.5	
Ferry Boat						
SURKHAB	1965	Twin		2 x 128	10.5	
SEEKHPAR	1966	Twin		2 x 128	10.5	
Water Boat						
SAQQA	1963	Single		330	8.5	
Fire Float						
SABIL	1973	Twin		2 x 650	13.0	
Anchor Boat						
SEA ELEPHANT	1959	Single		250	6.0	
Heave up Boat						
SHERDIL	1968	Single		320	8.0	
Dangerous Care Barge						
JANBAZ	1969	Single		320	8.5	

Source: KPT

Appendix Table 7.4.2.3 Dredgers and Hopper Barges at Karachi Port

Kind of Dredger and Name	Year of Built	Capacity	Dredging Depth (ft.)	Speed (knots)	Manufact -urer	Remarks
Bucket Dredger						
IZHAR	1965	1,250 t/hr.	50	10.0	U.K	
FATEH	1965	1,250 t/hr.	50	10.0	U.K	
Cutter Suction Dredger						
KARAMAT	1969	4,750m3/hr	50	N.P	W.Germany	
Grab Hopper Dredger						
AMINUDDIN	1969	1,000 t/hr.	50	10.0	K.S.E.W	
Trailing Suction Dredger						
RAJHANS	1965	700 t/hr.	50	9.5	K.S.E.W	
MAHMUD UL HASAN	1980	2,000m3/hr	60	12.0	France	
Hopper Barge						
WHIMBREL	1959	800 tons		9.0	K.S.E.W	
CURLEW	1959	800 tons		9.0	K.S.E.W	
KULUNG	1966	800 tons		9.5	K.S.E.W	
SARAS	1972	1,000 tons		9.5	Holland	
NEELSAR	1972	1,000 tons		9.5	Holland	

Source: KPT

Appendix Table 7.4.2.4 Cargo handling Equipment at Qasim Port

Kind of Equipment	Year of Built	Capacity (ton)	No. of Units	Manufact -urer	Remarks
Crane					
Jones 851 M.	1975	35	1		
Jones 565 C	1977	30	1		
Jones 565 HLB	1976	8	2		
Jones 971 HLB	1980	24	2		
	1986	24	2		
Jones 571 M.	1977	32	2		
Truck Crane	1977	2	2		
Forklift					
	1977	3.2	1	BALKAN	
	1978	3.5	32	CLIMAX	
	1978	9.0	4	CLIMAX	
	1986	4.0	15	HYSRTER	
Tractors Towing Units					
	1976	1.0	15		
Tractor	1980/81	4.5	22		
Trailer	1978	20	73		

Source: PQA

Appendix Table 7.4.2.5 Harbour Crafts at Qasim Port

Kind of Craft and Name	Year of Built	Capacity (BHP)	LOA	Brdth	Draft	Speed (knots)
Buoy Tender						
MAZDOOR	1978	800 x 2	43.00	11.00	3.50	10
Berthin Tug						
KADIRO	1977	1,760 x 2	29.00	9.75	3.75	12
GHARO	1977	1,760 x 2	29.00	9.75	3.75	12
CHARA	1978	1,760 x 2	29.00	9.75	3.75	12
lighterage Tug						
SOHNA	1979	495 x 2	22.50	7.20	2.67	10
MOHANA	1979	495 x 2	22.50	7.20	2.67	10
Pilot launches						
YAQOOT	1978	400 x 2	19.30	5.20	1.15	12
LAHOOT	1978	400 x 2	19.30	5.20	1.15	12
Survey launches						
JATLI	1981	350 x 2	19.47	5.49	2.02	13
SADAF	1980	124	8.20	2.10	0.87	12
A. PAIMA	1988	336 x 2	11.00	4.00	0.90	13
SEEMA	1986	90	8.00	2.60	1.00	7.6
Inspection launches						
ISARO	1977	368 x 2	18.24	5.00	1.78	17
Mooring launches						
HOORI	1978	163	10.75	3.50	1.85	10
NOORI	1978	163	10.75	3.50	1.85	10
Working Boats						
AMBERS	1980	100 x 2	11.27	2.74	0.77	17
ANJUM	1980	100 x 2	11.27	2.74	0.77	17
Water Barge						
HALEJA	1978	180	30.55	7.44	2.20	5
Grab Barge						
KETI	1987	–	20.20	10.00	1.15	
Hopper Barge						
WARIA	1987	150 m3	20.30	8.00	2.35	
JHARI	1987	150 m3	20.30	8.00	2.35	

Source: PQA

Appendix Table 7.5.1.1 Cargo handled at Karachi Port by Commodity

unit: tons

Commodities	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93
Grand Total	17,718,035	17,864,182	19,074,650	18,709,735	20,452,867	22,169,996
Import Total	14,332,653	14,072,595	15,023,670	14,714,142	15,266,483	17,255,570
Export Total	3,385,382	3,791,587	4,050,980	3,995,593	5,186,384	4,914,426
Import Cargo:						
(Dry Bulk Cargo)						
Cement	12,069	23,996	3,356	19,115	7,074	44,465
Fertilizer	1,044,421	782,402	1,066,758	1,120,858	831,568	1,153,565
Rock Phosphete	251,111	263,398	271,052	242,511	313,592	280,048
Iron Scrap	666,830	333,133	167,472	247,640	596,363	353,195
Sugar	323,081	27,437	178,604	453,654	112,903	58,924
Sulphur	27,020	44,696	21,000	19,483	22,817	39,335
Wheat		99,217	263,796		4,510	
Total	2,324,532	1,574,279	1,972,038	2,103,261	1,888,827	1,929,532
(General Cargo)						
Bamboos	1,246	1,888	1,104	872	2,260	4,648
Dyes & Chemicals	179,211	177,107	161,400	135,995	166,748	172,207
Jute	99,433	112,923	134,694	89,781	122,310	85,335
News Print	26,803	40,839	43,358	59,012	47,771	59,219
Other Papar	140,242	144,301	94,946	109,490	79,124	102,080
Timber	21,279	19,107	22,167	12,018	4,622	5,579
Logs	8,562	15,528	13,925	23,237	13,812	24,768
Tea	69,004	68,664	75,230	55,736	55,773	69,296
Iron & Steel	455,156	444,952	418,664	439,586	395,148	399,445
Motor Vehicles	35,596	30,059	26,828	37,764	24,333	80,604
Tractors	55					
Rubber Scrap	2,352	3,524	4,271	2,875	4,000	2,731
Other Cargo	2,114,724	2,346,140	2,293,265	2,518,515	2,889,260	3,181,003
Total	3,155,663	3,405,032	3,289,852	3,484,881	3,805,161	4,186,915
(Liquid Bulk Cargo)						
Crude Oil	3,840,994	3,570,790	3,507,095	4,011,951	4,037,873	4,029,173
Diesel & Other Oil	2,545,919	2,877,177	3,077,854	2,870,473	3,496,391	4,113,413
Fuel Oil	746,289	836,731	1,071,381	455,735	717,181	1,085,444
Kerosene Oil	582,695	621630	769,810	437,995	67,419	154,213
Petrol	121,707	203,383	181,276	219,582	126,246	225,623
Palm Oil	473,679	427,970	694,825	749,098	927,472	1,168,209
Soyabeen Oil	402,925	454,843	374,133	280,262	119,614	305,949
Tallow	138,250	100,760	85,406	100,904	80,299	57,099
Total	8,852,458	9,093,284	9,761,780	9,126,000	9,572,495	11,139,123
Export Cargo:						
(Dry Bulk Cargo)						
Fertilizer	0	0	0	0	41	0
Rice	412,346	201,790	241,867	321,119	564,483	435,936
Steel	26,622	111	1,829	1,871	290	72
Wheat	2,286	6,329	0	0	0	0
Chrome Ore	40,527	40,514	33,270	43,234	42,228	43,965
Sugar	0	44,407	5,929	0	0	0
Cement	0	0	0	51,347	40,073	17,002
Clinker	0	0	0	0	25,087	33,995
Total	481,781	293,151	282,895	417,571	672,202	530,970
(General Cargo)						
Cotton	397,286	599,749	211,590	142,253	319,489	155,840
Cotton Yarn	109,943	79,993	50,597	167,290	240,182	211,272
Cowdung	146,615	151,408	177,078	156,944	142,943	198,579
Food Grain	0	0	0	0	0	0
Guwar Meal/Oil Cake	42,317	63,832	82,028	51,765	44,335	48,060
Leather	10,762	5,311	3,625	2,931	2,290	2,101
Rice Bran	49,462	39,401	68,801	39,528	36,787	20,961
Sport Goods	9,105	4,791	2,891	3,753	5,173	3,614
Taxtiles	101,519	72,296	61,859	124,924	211,650	199,196
Other Cargo	1,022,675	1,408,577	1,573,909	1,623,699	1,863,005	2,138,023
Total	1,889,684	2,425,358	2,232,378	2,313,087	2,865,854	2,977,646
(Liquid Bulk Cargo)						
Molasses	749,994	755,910	1,134,928	705,425	1,081,307	1,013,426
Petroleum Product/Ak	72,943	38,039	15,851	8,260	31,120	10,597
Naptha	143,767	79,109	42,641	186,397	145,948	64,540
Crude Oil	0	135,400	259,321	325,064	350,114	267,207
Oil (for Bunker)	47,213	64,620	82,966	39,789	39,839	50,040
Total	1,013,917	1,073,078	1,535,707	1,264,935	1,648,328	1,405,810

Source: KPT

Appendix Table 7.5.1.2 Cargo handled at Qasim Port by Commodity

unit: tons

Commodities	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93
Grand Total	3,721,757	5,153,707	5,311,926	5,656,393	7,159,082	8,061,001
Import Total	2,893,800	4,598,323	4,796,882	4,502,092	6,351,594	7,499,507
Export Total	827,957	555,384	515,044	1,154,301	807,488	561,494
Multi-Pupose Terminal						
Dry Imports						
Wheat	579,448	2,254,730	1,861,824	1,009,998	2,214,976	2,866,194
Phosphate	0	0	0	10,051	0	27,982
Urea	0	0	0	133,948	337,873	317,374
Sugar	0	0	0	0	11,532	11,835
Maize	0	0	0	9,145	9,572	0
Pulses	0	0	0	0	0	122,404
Cement	0	0	0	0	0	18,126
Jute	0	0	0	0	0	0
General Cargo	61	865	25,898	862	6,460	0
Container (TEU)	0	0	0	0	0	0
Toal	579,509	2,255,595	1,887,722	1,164,004	2,580,413	3,363,915
Liquid Imports						
Furnace Oil	0	0	338,121	828,221	1,102,502	1,345,234
Chemicals	0	0	0	0	31,360	16,000
Edible Oil	0	0	0	0	0	19,000
L.P.G	0	0	0	0	0	10,219
Total	0	0	338,121	828,221	1,133,862	1,390,453
Dry Exports						
Wheat (Re-exp)	17,175	13,638	24,231	6,314	0	0
Pig Ore	0	10,899	9,550	1,500	0	0
Coke	0	0	65,000	28,111	27,500	0
Rice	791,217	486,420	394,423	1,018,447	774,148	403,959
Rice Bran	0	0	0	0	0	0
Cotton	0	0	0	0	0	0
Steel Billets	0	0	0	0	0	0
HRS Coils	9,758	23,860	0	0	0	0
Fertilizer (Urea)	0	10,270	0	0	0	0
Cow Dung	9,807	10,028	0	458	0	0
Cement	0	0	15,000	99,471	0	0
General Cargo	0	269	6,840	0	5,840	29
Container	1	0	0		0	0
Total	827,957	555,384	515,044	1,154,301	807,488	403,988
Liquid Exports						
Crude Oil	0	0	0	0	0	157,506
Total	0	0	0	0	0	157,506
Iron Ore & Coal Berth						
Dry Imports						
Iron Ore	1,504,510	1,396,628	1,547,304	1,501,621	1,622,743	1,701,136
Coal	809,781	909,786	1,023,735	979,504	985,041	1,044,003
Mang. Ore	0	36,314	0	28,742	29,535	0
Total	2,314,291	2,342,728	2,571,039	2,509,867	2,637,319	2,745,139

Source: PQA

Appendix Table 7.6.1.1 Classification of Vessels Calling at Qasim Port

Year	87–88	88–89	89–90	90–91	92–93
(Wheat)					
under 10,000 GRT	3	2	1	2	2
–20,000	8	29	18	10	14
–25,000	3	20	21	7	12
–30,000	0	12	8	9	14
–35,000	6	3	4	2	17
over 35,000	1	5	4	1	12
Total	21	71	56	31	71
(Oil)					
under 10,000 GRT	0	0	6	44	0
–20,000	0	0	9	0	60
–25,000	0	0	0	0	6
–30,000	0	0	0	0	1
–35,000	0	0	0	0	0
over 35,000	0	0	0	0	0
Total	0	0	15	44	67
(Rice)					
under 10,000 GRT	41	31	15	54	19
–20,000	26	12	10	26	15
–25,000	0	0	1	3	1
–30,000	0	0	1	0	0
–35,000	0	0	0	0	0
over 35,000	0	0	0	0	0
Total	67	43	27	83	35
(Pig Iron)					
under 10,000 GRT	0	0	1	1	0
–20,000	0	0	0	0	0
–25,000	0	0	0	0	0
–30,000	0	0	0	0	0
–35,000	0	0	0	0	0
over 35,000	0	0	0	0	0
Total	0	0	1	1	0
(Others)					
under 10,000 GRT	6	16	7	16	17
–20,000	2	3	8	8	29
–25,000	0	0	1	1	5
–30,000	0	0	0	0	0
–35,000	0	0	0	0	0
over 35,000	0	0	0	0	0
Total	8	19	16	25	51
(Iron&Coal)					
under 10,000 GRT	0	0	0	0	0
–20,000	7	8	2	2	3
–25,000	19	11	15	10	5
–30,000	15	22	16	19	9
–35,000	9	13	22	12	17
over 35,000	8	4	4	14	26
Total	58	58	59	57	60

Source: PQA

APPENDICES for CHAPTER 9

Appendix Table 9.1.1 Air Passenger Traffic in Pakistan

Year	Domestic				International				Total (Domestic + International)			
	Embarked	Dis-embarked	Transit	Total	Embarked	Dis-embarked	Transit	Total	Embarked	Dis-embarked	Transit	Total
1983-84	2,072,618	2,072,618	125,544	4,270,780	1,467,619	1,471,132	386,316	3,325,067	3,540,237	3,543,750	511,860	7,595,847
1984-85	2,262,025	2,262,025	121,238	4,645,287	1,473,854	1,483,060	403,355	3,360,269	3,735,879	3,745,085	524,593	8,005,556
1985-86	2,515,083	2,515,083	169,356	5,199,522	1,541,104	1,579,562	508,674	3,629,340	4,056,187	4,094,645	678,030	8,828,862
1986-87	2,783,049	2,783,049	160,472	5,726,569	1,535,102	1,528,583	439,696	3,503,381	4,318,151	4,311,632	600,168	9,229,950
1987-88	3,047,869	3,047,869	164,600	6,260,338	1,706,030	1,620,070	425,730	3,751,830	4,753,899	4,667,939	590,330	10,012,168
1988-89	3,303,664	3,303,664	213,602	6,820,930	1,748,835	1,661,148	333,668	3,743,651	5,052,499	4,964,812	547,270	10,564,581
1989-90	3,278,957	3,278,957	218,949	6,776,863	1,875,926	1,725,681	361,671	3,963,278	5,154,883	5,004,638	580,620	10,740,141
1990-91	3,289,517	3,289,517	207,143	6,786,177	1,693,551	1,693,551	413,935	3,801,037	4,983,068	4,983,068	621,078	10,587,214
1991-92	3,659,214	3,659,214	216,728	7,535,156	1,895,996	1,895,996	375,215	4,167,206	5,555,210	5,555,210	591,943	11,702,362
1992-93	3,861,459	3,861,459	229,525	7,952,443	1,963,647	1,827,464	337,114	4,128,225	5,825,106	5,688,923	566,639	12,080,668

Source: Civil Aviation Statistics (CAA)

Appendix Table 9.1.2 Domestic Passengers by Major Airport

Year	Karachi		Islamabad		Lahore		Peshawar		Multan		Quetta		Others		Total
	Passengers	Share	Passengers	Share	Passengers	Share	Passengers	Share	Passengers	Share	Passengers	Share	Passengers	Share	
1983-84	1,504,210	35.2%	785,131	18.4%	962,146	22.5%	259,966	6.1%	167,866	3.9%	130,180	3.0%	461,279	10.8%	4,270,779
1984-85	1,635,084	35.2%	859,813	18.5%	1,068,841	23.0%	272,417	5.9%	184,609	4.0%	142,516	3.1%	482,005	10.4%	4,645,286
1985-86	1,785,807	34.3%	974,577	18.7%	1,190,423	22.9%	284,492	5.5%	227,464	4.4%	159,681	3.1%	577,076	11.1%	5,199,521
1986-87	1,928,357	33.7%	1,086,838	19.0%	1,314,200	22.9%	282,483	4.9%	223,527	3.9%	192,755	3.4%	698,407	12.2%	5,726,568
1987-88	2,071,463	33.1%	1,212,854	19.4%	1,416,555	22.6%	309,351	4.9%	241,590	3.9%	205,359	3.3%	803,164	12.8%	6,260,337
1988-89	2,203,341	32.3%	1,325,809	19.4%	1,553,924	22.8%	357,250	5.2%	269,079	3.9%	207,423	3.0%	904,102	13.3%	6,820,929
1989-90	2,209,337	32.6%	1,318,110	19.5%	1,530,030	22.6%	356,816	5.3%	272,713	4.0%	211,992	3.1%	877,863	13.0%	6,776,862
1990-91	2,198,716	32.4%	1,301,070	19.2%	1,485,760	21.9%	346,446	5.1%	265,930	3.9%	215,604	3.2%	972,649	14.3%	6,786,176
1991-92	2,445,518	32.5%	1,466,845	19.5%	1,686,073	22.4%	393,349	5.2%	300,042	4.0%	236,683	3.1%	1,006,644	13.4%	7,535,155
1992-93	2,570,827	32.3%	1,555,295	19.6%	1,799,312	22.6%	403,327	5.1%	313,112	3.9%	280,874	3.5%	1,029,694	12.9%	7,952,442

Note : Number of Passengers both departure and arrival
Source : Civil Aviation Statistics (CAA)

Appendix Table 9.1.3 International Passengers by Airport

Year	Karachi		Islamabad		Lahore		Peshawar		Gwadar		Quetta		Total
	Passengers	Share	Passengers	Share	Passengers	Share	Passengers	Share	Passengers	Share	Passengers	Share	Passengers
1983-84	2,867,130	86.2%	324,397	9.8%	89,530	2.7%	39,312	1.2%	4,694	0.1%			3,325,064
1984-85	2,860,101	85.1%	327,871	9.8%	136,012	4.0%	33,094	1.0%	3,186	0.1%			3,360,265
1985-86	3,130,969	86.3%	328,655	9.1%	126,677	3.5%	33,434	0.9%	9,605	0.3%			3,629,341
1986-87	2,913,567	83.2%	400,896	11.4%	143,475	4.1%	38,238	1.1%	7,205	0.2%			3,503,382
1987-88	3,072,191	81.9%	464,068	12.4%	169,091	4.5%	40,704	1.1%	5,776	0.2%			3,751,831
1988-89	2,999,866	80.1%	499,484	13.3%	187,193	5.0%	50,221	1.3%	6,887	0.2%			3,743,652
1989-90	3,115,819	78.6%	509,701	12.9%	262,980	6.6%	64,848	1.6%	9,930	0.3%			3,963,279
1990-91	2,952,118	77.7%	453,337	11.9%	315,561	8.3%	66,802	1.8%	12,357	0.3%	862	0.0%	3,801,038
1991-92	3,115,865	74.8%	511,309	12.3%	427,003	10.2%	96,545	2.3%	12,916	0.3%	3,568	0.1%	4,167,207
1992-93	2,979,810	71.5%	540,382	13.0%	453,840	10.9%	130,798	3.1%	11,700	0.3%	11,695	0.3%	4,128,226

Source: Civil Aviation Statistics (CAA)

Appendix Table 9.1.4 Air Cargo in Pakistan

(Unit: Ton)

Year	Domestic (Loaded + Un-Loaded)	Growth (%)	International (Loaded + Un-Loaded)	Growth (%)	Total	Growth (%)
1983-84	47,365		102,930		150,295	
1984-85	57,148	20.7%	111,503	8.3%	168,651	12.2%
1985-86	59,573	4.2%	129,162	15.8%	188,735	11.9%
1986-87	59,897	0.5%	131,682	2.0%	191,579	1.5%
1987-88	61,295	2.3%	120,588	-8.4%	181,883	-5.1%
1988-89	63,765	4.0%	127,251	5.5%	191,016	5.0%
1989-90	70,188	10.1%	135,446	6.4%	205,634	7.7%
1990-91	69,760	-0.6%	119,451	-11.8%	189,211	-8.0%
1991-92	69,245	-0.7%	122,724	2.7%	191,969	1.5%
1992-93	81,422	17.6%	129,672	5.7%	211,094	10.0%

Note : Cargo volume include mail
Source: Civil Aviation Statistics (CAA)

Appendix Table 9.1.5 Air Mail in Pakistan

(Unit: Ton)

Year	Domestic (Loaded + Un-Loaded)	Growth (%)	International (Loaded + Un-Loaded)	Growth (%)	Total	Growth (%)
1983-84	3,352		3,194		6,546	
1984-85	3,138	-6.4%	2,975	-6.9%	6,113	-6.6%
1985-86	2,864	-8.7%	2,875	-3.4%	5,739	-6.1%
1986-87	3,038	6.1%	2,871	-0.1%	5,909	3.0%
1987-88	3,105	2.2%	2,699	-6.0%	5,804	-1.8%
1988-89	2,844	-8.4%	2,790	3.4%	5,634	-2.9%
1989-90	2,616	-8.0%	2,918	4.6%	5,534	-1.8%
1990-91	2,645	1.1%	2,640	-9.5%	5,285	-4.5%
1991-92	2,599	-1.7%	2,422	-8.3%	5,021	-5.0%
1992-93	2,319	-10.8%	2,538	4.8%	4,857	-3.3%

Source: Civil Aviation Statistics (CAA)

Appendix Table 9.1.6 Trend of Passenger Traffic by PIA

Year	Domestic	International							Total
		Middle East	Europe	Far East	Regional	5th Freedom	6th Freedom	Sub Total	
1981-82	1,509,405	901,872	155,428	89,822	106,936	113,217	99,034	1,466,309	2,975,714
1982-83	1,681,231	970,532	187,302	93,454	113,596	120,246	96,980	1,582,110	3,263,341
1983-84	1,871,335	928,428	188,083	73,346	122,079	133,997	121,488	1,567,421	3,438,756
1984-85	2,059,105	883,999	202,582	87,147	135,901	151,815	88,871	1,550,315	3,609,420
1985-86	2,315,924	901,240	219,414	92,388	142,650	137,713	82,279	1,575,684	3,891,608
1986-87	2,579,295	878,560	232,845	99,298	145,730	132,880	87,457	1,576,770	4,156,065
1987-88	2,801,929	933,221	254,491	97,604	138,300	158,812	143,175	1,725,603	4,527,532
1988-89	3,076,057	924,744	302,534	107,021	132,051	156,053	174,819	1,797,222	4,873,279
1989-90	3,050,374	1,013,837	314,655	94,207	162,556	129,659	177,660	1,892,574	4,942,948
1990-91	3,038,067	910,727	325,168	99,100	152,707	124,394	165,464	1,777,560	4,815,627
1991-92	3,393,324	1,030,860	331,705	124,971	159,726	125,783	186,765	1,959,810	5,353,134
1992-93	3,516,563	1,106,245	340,287	134,537	143,590	116,146	188,451	2,029,256	5,545,819

Source : PIA

Appendix Table 9.1.7 Aircraft Movement in Pakistan

Year	Karachi					Islamabad					Lahore					Peshawar					Other Airports					Total
	DOM	INT'L	Others	Total	Share	DOM	INT'L	Others	Total	Share	DOM	INT'L	Others	Total	Share	DOM	INT'L	Others	Total	Share	DOM	INT'L	Others	Total	Share	
1983-84	12,060	23,172	15,846	51,078	28.6%	10,774	1,685	9,897	22,356	12.5%	10,358	773	4,335	15,466	8.7%	5,960	342	1,673	7,975	4.5%	21,361	433	60,055	81,849	45.8%	178,724
1984-85	12,327	23,930	4,899	41,156	26.9%	11,063	1,964	16,541	29,568	19.4%	11,472	1,023	3,371	15,866	10.4%	5,634	326	139	6,099	4.0%	23,168	434	36,514	60,116	39.3%	152,805
1985-86	14,525	25,469	8,297	48,291	31.7%	11,915	1,433	13,450	26,798	17.6%	11,355	1,175	5,126	17,656	11.6%	5,443	306	690	6,439	4.2%	27,354	416	25,535	53,305	35.0%	152,489
1986-87	17,243	25,301	7,820	50,364	32.2%	11,674	2,116	11,697	25,487	16.3%	12,240	1,455	4,748	18,443	11.8%	4,867	420	401	5,688	3.6%	29,908	379	26,175	56,462	36.1%	156,444
1987-88	19,477	24,990	6,931	51,398	31.4%	12,425	2,564	10,830	25,819	15.8%	13,421	1,546	6,906	21,873	13.4%	5,670	388	433	6,491	4.0%	32,909	286	24,789	57,984	35.5%	163,565
1988-89	20,486	25,084	7,108	52,678	27.7%	15,121	2,549	9,177	26,847	14.1%	14,443	1,560	13,998	30,001	15.8%	7,136	392	1,414	8,942	4.7%	36,161	234	35,212	71,607	37.7%	190,075
1989-90	20,420	25,183	12,498	58,101	30.1%	15,789	2,623	14,629	33,041	17.1%	14,403	2,063	11,754	28,220	14.6%	6,910	688	1,760	9,358	4.8%	36,445	323	27,677	64,445	33.4%	193,165
1990-91	20,379	26,987	11,222	58,588	29.5%	16,001	2,344	13,355	31,700	16.0%	14,516	2,678	11,350	28,544	14.4%	7,148	675	1,102	8,925	4.5%	40,060	412	30,426	70,898	35.7%	198,655
1991-92	22,029	24,649	16,371	63,049	28.6%	17,594	2,758	16,190	36,542	16.6%	16,019	3,846	16,794	36,659	16.7%	7,514	1,114	1,619	10,247	4.7%	39,674	496	33,437	73,607	33.4%	220,104
1992-93	24,227	23,458	15,010	62,695	29.0%	18,493	2,809	14,616	35,918	16.6%	17,348	3,205	17,718	38,271	17.7%	8,026	930	2,128	11,090	5.1%	40,692	539	27,149	68,374	31.6%	216,348

Note : DOM : Domestic Scheduled + Non Scheduled
INTL : International Scheduled + Non Scheduled
Others : General Aviation and Local
Source : Civil Aviation Statistics (CAA)

Appendix Table 9.1.8 Domestic Aircraft Movement by Type of Aircraft in 1992-93

Aircraft	Seat	Karachi	Shere	Islamabad	Shere	Lahore	Shere	Peshawar	Shere	Others	Shere	Total	Shere
B747-200	404	2,435	49.5%	1,127	22.9%	1,361	27.6%	0	0.0%	0	0.0%	4,923	4.5%
A-300	246	4,122	35.4%	1,862	16.0%	2,890	24.8%	1,732	14.9%	1,046	9.0%	11,652	10.7%
A-310	212	1,834	44.1%	879	21.1%	1,404	33.7%	0	0.0%	46	1.1%	4,163	3.8%
B-707	150	488	29.5%	371	22.4%	162	9.8%	30	1.8%	604	36.5%	1,655	1.5%
B-737	122	6,137	25.4%	4,864	20.1%	6,684	27.7%	454	1.9%	6,010	24.9%	24,149	22.2%
BAC-III		224	42.1%	220	41.4%	88	16.5%	0	0.0%	0	0.0%	532	0.5%
F-27	44	8,292	14.7%	7,102	12.6%	4,367	7.7%	5,304	9.4%	31,386	55.6%	56,451	51.9%
DHC-6	19	0	0.0%	1,744	45.1%	34	0.9%	512	13.2%	1,578	40.8%	3,868	3.6%
IL-86		695	50.5%	324	23.5%	358	26.0%	0	0.0%	0	0.0%	1,377	1.3%
Total		24,227	22.3%	18,493	17.0%	17,348	15.9%	8,032	7.4%	40,670	37.4%	108,770	100.0%

Source : Civil Aviation Statistics (CAA)

Appendix Table 9.1.9 Trend of Passenger Traffic by PIA

	Items	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93
International	ASKs (Million)	10,020	10,681	11,160	10,362	111,531	12,055
	RPKs (Million)	6,289	6,847	7,055	6,790	7,443	7,556
	S.F (%)	62.8	64.1	63.2	65.5	64.5	62.7
Domestic	ASKs (Million)	2,902	3,082	3,088	3,039	3,535	3,678
	RPKs (Million)	2,091	2,268	2,249	2,207	2,482	2,546
	S.F (%)	72.1	73.6	72.8	72.6	70.2	69.2
Total	ASKs (Million)	12,922	13,763	14,248	13,401	15,066	15,733
	RPKs (Million)	8,380	9,115	9,304	8,997	9,925	10,102
	S.F (%)	64.9	66.2	65.3	67.1	65.9	64.2

Note : ASKs : Available Seat Kilometers
RPKs : Revenue Passengers Kilometers
Souse : PIA

Appendix Table 9.1.10 Trend of Freight Traffic by PIA

	Items	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93
International	AFTK (Million)	576.67	624.40	637.16	599.47	636.72	660.61
	RFTK (Million)	334.33	376.69	398.05	367.16	355.32	363.46
	L.F (%)	58.0	60.3	62.5	61.2	55.8	55.0
Domestic	AFTK (Million)	83.07	85.64	87.31	89.49	115.80	122.39
	RFTK (Million)	26.35	28.60	32.31	32.24	30.90	36.66
	L.F (%)	31.7	33.4	37.1	36.0	26.7	30.0
Total	AFTK (Million)	659.74	710.04	724.47	688.96	752.52	783.00
	RFTK (Million)	360.68	405.29	430.36	399.40	396.22	400.12
	L.F (%)	54.7	57.1	59.4	58.0	51.3	51.1

Note : AFTK : Available Freight Tonne Kilometers
RPTK : Revenue Freight Tonne Kilometers
Souse : PIA

Appendix Table 9.1.11 Transition of Aircraft Fleet Possession by PIA

Type of Aircraft	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93
B-747 (Pax)	4	3	2	4	5	6	7	7	6	6	6
B-747 (Combi)	-	1	2	2	3	2	1	1	2	2	2
DC-10	4	4	4	2	-	-	-	-	-	-	-
A-300	4	6	7	8	8	8	8	8	8	8	11
A-310	-	-	-	-	-	-	-	-	1	3	4
B-707 (Pax)	5	5	5	5	4	4	3	3	3	2	-
B-707 (Frt)	2	2	2	2	2	2	2	2	2	2	2
B-720B	3	3	2	1	-	-	-	-	-	-	-
B-737	-	-	5	6	6	6	6	6	6	6	6
F-27	9	9	9	9	9	11	11	14	14	14	14
DHC-6	-	-	2	2	2	2	2	2	2	2	2
IL-86 (Leased)	-	-	-	-	-	-	-	-	-	1	1
Total	31	33	40	41	39	41	40	43	44	46	48

Source : Civil Aviation Statistics (CAA)

Appendix Table 9.1.12 Income and Expenditure in All Airport

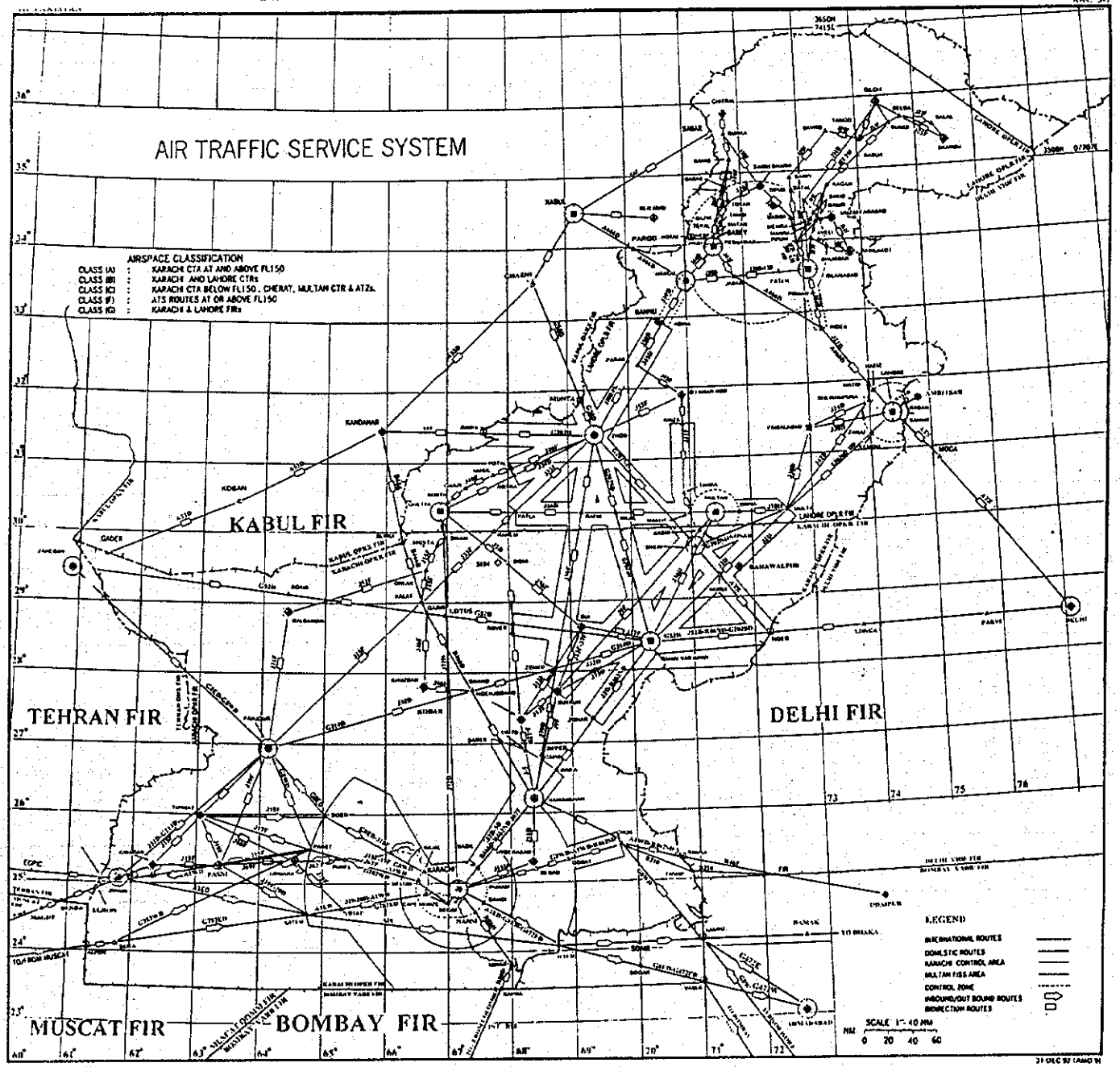
(Rs. thousand)

	Airport	1987-88			1988-89			1989-90			1990-91			1991-92			1992-93		
		Income	Expenditure	Surplus	Income	Expenditure	Surplus	Income	Expenditure	Surplus	Income	Expenditure	Surplus	Income	Expenditure	Surplus	Income	Expenditure	Surplus
Balochistan	Quetta	5,268	17,711	-12,443	5,514	27,403	-21,889	5,527	26,673	-21,146	8,178	28,648	-20,470	10,514	54,727	-44,213	12,440	47,773	-35,333
	Gwadar	1,395	3,837	-2,442	1,227	5,202	-3,975	1,613	5,435	-3,822	3,348	6,473	-3,125	3,670	10,121	-6,451	3,492	15,170	-11,678
	Jiwani	75	4,542	-4,467	89	6,626	-6,537	86	6,724	-6,638	127	7,072	-6,945	696	9,954	-9,258	129	13,149	-13,020
	Khuzdar	44	1,564	-1,520	95	2,579	-2,484	96	2,873	-2,777	202	3,738	-3,536	172	5,753	-5,581	178	8,713	-8,535
	Panjgur	439	4,220	-3,781	485	6,096	-5,611	478	8,564	-8,086	778	7,305	-6,527	1,086	10,487	-9,401	793	15,197	-14,404
	Pasni	644	3,679	-3,035	684	5,786	-5,102	733	5,574	-4,841	1,222	8,403	-7,181	1,299	9,634	-8,335	1,251	15,776	-14,525
	Turbat	852	3,023	-2,171	847	4,992	-4,145	751	4,734	-3,983	1,815	6,035	-4,220	2,169	8,255	-6,086	1,853	11,630	-9,777
	Zhob	401	3,697	-3,296	455	5,017	-4,562	437	5,918	-5,481	553	5,756	-5,203	560	9,471	-8,911	487	11,419	-10,932
	Dalbandin	9	958	-949	2	1,337	-1,335	3	1,842	-1,839	88	2,247	-2,159	159	3,448	-3,289	118	5,579	-5,461
	Ormara			0			0		28	-28	43	7,020	-6,977	160	4,641	-4,481	177	8,053	-7,876
	Sibi	1	259	-258			0			0			0			0			
Sindh	Karachi	914,187	302,658	611,529	998,456	450,303	548,153	1,163,709	451,877	711,832	1,429,457	531,077	898,380	1,631,111	780,005	851,106	1,845,395	1,447,849	397,546
	Hyderabad	214	3,270	-3,056	211	4,666	-4,455	468	4,490	-4,022	1,236	4,947	-3,711	521	6,759	-6,238	474	9,982	-9,508
	Moenjodaro	253	4,932	-4,679	315	8,384	-8,069	257	8,132	-7,875	905	10,605	-9,700	3,915	14,871	-10,956	1,204	18,737	-17,533
	Nawabshah	270	7,389	-7,119	762	12,773	-12,011	350	12,401	-12,051	549	14,805	-14,256	509	21,227	-20,718	505	33,085	-32,580
	Sukkur	1,599	6,373	-4,774	2,051	9,814	-7,763	3,127	10,825	-7,698	5,520	13,384	-7,864	3,915	17,883	-13,968	2,608	33,995	-31,387
	Jacobabad	277	1,142	-865	68	2,170	-2,102	56	2,225	-2,169	100	2,820	-2,720	78	4,511	-4,433	82	6,607	-6,525
	Mirpur Khas	6	599	-593	11	843	-832	12	985	-973	22	1,092	-1,070	13	1,606	-1,593	19	3,338	-3,319
	Talhar		324	-324			0			0			0			0			
Punjab	Islamabad	125,358	90,423	34,935	128,872	129,246	-374	149,719	132,673	17,046	172,696	150,743	21,953	215,318	219,153	-3,835	226,247	297,834	-71,587
	Lahore	83,225	98,521	-15,296	96,560	158,312	-61,752	111,430	159,195	-47,765	161,025	169,088	-8,063	213,430	255,115	-41,685	232,856	340,965	-108,109
	Faisalabad	3,599	15,394	-11,795	4,586	24,582	-19,996	4,921	24,857	-19,936	6,420	30,596	-24,176	9,245	41,802	-32,557	10,879	56,777	-45,898
	Multan	7,422	23,267	-15,845	9,398	38,497	-29,099	10,050	39,824	-29,774	12,037	47,628	-35,591	14,083	63,036	-48,953	13,402	89,123	-75,721
	Mianwali	26	802	-776	23	1,235	-1,212	19	1,331	-1,312	72	1,948	-1,876	33	2,978	-2,945	17	4,252	-4,235
	Bahawalpur	151	1,776	-1,625	216	3,070	-2,854	212	3,431	-3,219	508	4,489	-3,981	553	5,936	-5,383	546	16,869	-16,323
	R.Y.Khan	2	1,942	-1,940	6	3,013	-3,007	27	4,263	-4,236	417	6,697	-6,280	590	9,364	-8,774	614	12,498	-11,884
	Bhagtanwala		28	-28			0			0			0			0			0
	Mangla			0			0			0			0			0			0
	Walton			0			0	2	8,795	-8,793	486	17,643	-17,157	725	24,452	-23,727	836	35,175	-34,339
N.W.F.P	Peshawar	16,589	24,690	-8,101	20,374	37,351	-16,977	25,923	39,282	-13,359	37,779	44,291	-6,512	55,200	62,453	-7,253	57,898	87,645	-29,747
	Chitral	441	3,662	-3,221	468	5,225	-4,757	308	5,619	-5,311	748	5,592	-4,844	836	6,886	-6,050	615	8,871	-8,256
	D.I.Khan	339	4,487	-4,148	386	6,377	-5,991	378	6,052	-5,674	776	6,121	-5,345	918	8,985	-8,067	998	12,585	-11,587
	Saidu Sharif	394	5,171	-4,777	397	7,574	-7,177	373	7,685	-7,312	583	9,046	-8,463	1,308	11,863	-10,555	883	16,722	-15,839
	Bannu	134	3,305	-3,171	169	4,896	-4,727	173	4,988	-4,815	270	4,824	-4,554	313	6,936	-6,623	360	10,629	-10,269
	Kohat	28	2,196	-2,168	29	2,726	-2,697	32	3,489	-3,457	47	3,972	-3,925	24	6,140	-6,116	9	8,967	-8,958
	Parchinar			0			0			0			0		77	-77		2,011	-2,011
Northern Area	Gilgit	421	8,277	-7,856	759	12,039	-11,280	373	11,773	-11,400	882	12,831	-11,949	649	18,319	-17,670	742	23,145	-22,403
	Skardu	1,022	6,637	-5,615	1,145	9,980	-8,835	1,083	10,242	-9,159	1,643	10,753	-9,110	1,869	16,237	-14,368	2,100	21,575	-19,475
	Muzaffarabad		709	-709	52	2,343	-2,291	134	3,458	-3,324	205	3,572	-3,367	374	5,427	-5,053	218	7,686	-7,468
	Rawalakot		609	-609	40	2,001	-1,961	64	2,775	-2,711	169	3,223	-3,054	209	3,758	-3,549	216	6,175	-5,959
	Grand Total	1,165,085	662,073	503,012	1,274,752	1,002,458	272,294	1,482,924	1,029,032	453,892	1,850,906	1,194,484	656,422	2,176,224	1,742,270	433,954	2,420,641	2,765,556	-344,915

Note: Expenditure is include the project cost

Source: Coorporate Budget 1993-94
Finance Division of CAA

Appendix Figure 9.1.1 Flight Information Service in Pakistan



Appendix Table 9.2.1 Annual Passengers and Weekly Aircraft Movements by Route (Domestic), 1992-93, O-D Table

(1)

	2-1 PESHAWAR	2-2 SAIDU SHARIF	3-1 KOHAT	5 D.I KHAN	6 BANNU	7 CHITRAL	10 ISLAMABAD	14 MIANWALI	15 FAISALABAD	17 LAHORE	23 MULTAN	25 BAHAWAL-PUR
2-1 PESHAWAR		F: 7 2,785		F: 9 6,965	F: 5 3,625	F: 21 19,172	F: 16 D: 6 21,014			W: 4 N: 3 F: 7 36,525	1,251	
2-2 SAIDU SHARIF	F: 7 5,255					F: 2 266	F: 9 8,160					
3 KOHAT							71					
5 D.I KHAN	F: 11 9,373						3,995			F: 2 2,747	955	
6 BANNU	F: 5 8,045											
7 CHITRAL	F: 21 19,636	F: 2 419					262			W: 2 WII: 5 N: 21 F:17		
10 ISLAMABAD	F: 14 D: 6 20,178	F: 9 7,010	132	F: 2 3,189		341		55	F: 14 27,144	239,659	F: 3 15,267	4,258
14 MIANWALI							65			79		
15 FAISALABAD							F: 14 27,399			7		
17 LAHORE	W:4 N:3 F:9 37,499			F: 2 1,620		W:2 WII: 5 N:28 F:17	234,687	39	44		N:14 F: 2 54,851	F: 7 8,160
23 MULTAN	1,127			734			F: 3 15,700		N: 3 3,095	N: 14 F: 2 58,828		
25 BAHAWALPUR							4,664			F: 7 9,141		
27 R.Y KHAN										F: 3 7,657	N: 1 F: 2 582	
28 JACOBABAD												
29 SUKKUL							N: 3 2,191			N: 3 4,303	349	F: 2 168
31 NAWABSHAH							52					
32 MOENJODARO												
33 HYDERABAD							946			F: 3 2,715		
35 MIRPUR KHAS							74			B:8 WI: 15 WII: 12 N: 19 52		
39 KARACHI	WI: 14 92,587						B: 8 WI: 9 WII: 4 N:24 359,382		WI: 2 N: 6 72,737	459,293	N: 14 F: 3 75,561	2,189
40 QUETTA	949			653			WI: 6 41,392			WI: 1 N: 3 25,527		
41 ZHOB	965			F: 7 3,210			650				F: 4 2,986	
42 DALBANDIN												
43 KHUZDAR												
45 SUI												
46-1 PANJGUR												
46-2 TURBAT												
46-3 PASNI												
46-4 GWADAR												
46-5 JIWANI												
46-6 ORMARA												
47-1 GILGIT							F: 18 18,936					
47-2 SKARDU							N: 7 F: 1 31,479					
48-1 RAWALAKOT							D: 10 5,163					
48-2 MUZAFFARABAD							D: 10 4,766			16		
TOTAL	195,614	10,214	132	16,371	3,625	19,779	781,048	94	103,020	846,549	151,802	14,775

Note B : B747 class WI : A300 class WII : A310 class
N : B737 class F : F27 class D : DHC-6 class

Source : Civil Aviation Statistics

	27 R.Y KHAN	28 JACOBABAD	29 SUKKUL	31 NAWABSH-AH	32 MOENJODA-RO	33 HYDERAB-AD	35 MIRPUR KHAS	39 KARACHI	40 QUETTA	41 ZHOB	42 DALBANDIN	43 KHUZDAR
2-1 PESHAWAR								W: 9 N: 1 108,263	1,010	1,329		
2-2 SAIDU SHARIF												
3 KOHAT												
5 D.I KHAN									1,035	F: 7 4,267		
6 BANNU												
7 CHITRAL								B: 9 W: 9 WI: 3 N: 23				
10 ISLAMABAD			1,867	56		1,030	100	351,004	WI: 6 38,500	675		
14 MIANWALI												
15 FAISALABAD								WI: 2 N: 12 71,366				
17 LAHORE	F: 3 7,344		N: 3 3,714			F:3 2,630	B: 6 WI: 15 71	WII: 14 N: 20 460,674	WI:1 N:3 26,472			
23 MULTAN	F: 2 555		251					N: 13 67,581		F: 4 2,543		
25 BAHAWALPUR			F: 2 123					2,387				
27 R.Y KHAN								F: 5 9,230				
28 JACOBABAD			20	F: 2 164				F: 2 3,870				
29 SUKKUL		F: 2 426		F: 1 90		F: 1 355		N: 7 F: 8 44,416	F: 2 704			
31 NAWABSHAH		F:1 40	F: 1 194		F: 3 507	2		F: 5 2,757				
32 MOENJODARO		F: 1 128	F: 3 1,003	F: 2 340		F: 2 589	F: 2 115	F: 4 15,609				F: 1 946
33 HYDERABAD			F: 1 256	F: 1 8	F: 2 537			F: 7 1,300				
35 MIRPUR KHAS					F: 2 114			F: 2 595				
39 KARACHI	N: 1 F: 5 8,197	2,666	N: 6 F: 7 39,090	F: 5 2,832	F:7 16,638	F: 7 1,516	F: 2 607		WI: 7 63,172		394	714
40 QUETTA			383					WI: 7 62,800		F: 3 932	F: 2 504	34
41 ZHOB									F: 3 1,680			
42 DALBANDIN								520	F: 2 630			
43 KHUZDAR			106		F: 1 944			1013				
45 SUI			F: 2 986					2,912				
46-1 PANJGUR								F: 8 10,982	F: 2 1,372			
46-2 TURBAT								F: 15 34,604	F: 2 3,823		F: 2 789	F: 2 938
46-3 PASNI								N: 1 F: 7 11,588				
46-4 GWADAR								F: 9 24,495	37			
46-5 JIWANI								1,645				
46-6 ORMARA								F: 2 2,620				
47-1 GILGIT												
47-2 SKARDU												
48-1 RAWALAKOT												
48-2 MUZAFFARABAD												
TOTAL	16,096	3,260	47,993	3,490	18,740	6,122	893	1,292,231	138,435	9,746	1,687	2,632

	45 SUI	46-1 PANJGUR	46-2 TURBAT	46-3 PASNI	46-4 GWADAR	46-5 JIWANI	46-6 ORMARA	47-1 GILGIT	47-2 SKARDU	48-1 RAWALAK-OT	48-2 MUZAFFAR-ABAD	TOTAL
2-1 PESHAWAR												201,939
2-2 SAIDU SHARIF												13,681
3 KOHAT												71
5 D.I KHAN												22,372
6 BANNU												8,045
7 CHITRAL												20,317
10 ISLAMABAD								F:18 21,328	N:7 F:1 32,276	D:10 4,350	D:10 4,418	772,837
14 MIANWALI												144
15 FAISALABAD												98,772
17 LAHORE												837,805
23 MULTAN												150,414
25 BAHAWALPUR												16,315
27 R.Y KHAN												17,469
28 JACOBABAD												4,054
29 SUKKUL	631											53,633
31 NAWABSHAH												3,552
32 MOENJODARO												18,730
33 HYDERABAD	4											5,766
35 MIRPUR KHAS												835
39 KARACHI	2,739	F: 10 10,321	F: 24 29,576	N: 1 F: 8 13,191	F: 12 21,790	1,072	F: 2 2,333					1,278,597
40 QUETTA		F: 2 1,211	F: 2 3,590		33							138,008
41 ZHOB												9,491
42 DALBANDIN		1	F: 2 800									1,951
43 KHUZDAR			F: 2 863									2,926
45 SUI												3,898
46-1 PANJGUR			F: 6 4,071	F: 1 223	F: 2 1,379							18,027
46-2 TURBAT		F: 5 3,707		F: 5 3,334	F: 3 3,038	F: 1 242	F: 1 229					50,704
46-3 PASNI		F: 1 372	F: 6 1,191		F: 2 360		F: 1 319					13,830
46-4 GWADAR		657	F: 6 4,548	F: 2 493		F: 1 109						30,339
46-5 JIWANI			F: 1 200		F: 1 84							1,929
46-6 ORMARA			F: 1 292	F: 1 364								3,276
47-1 GILGIT									F: 1 178			19,114
47-2 SKARDU								F: 1 335				31,814
48-1 RAWALAKOT										D: 3 255		5,418
48-2 MUZAFFARABAD										D: 3 619		5,401
TOTAL	3,374	16,269	45,131	17,605	26,684	1,423	2,881	21,663	32,454	4,969	4,673	3,861,474

Appendix Table 9.2.2 Annual Passengers and Weekly Aircraft Movements by Route (Domestic), 1997-98, O-D Table

(1)

	2-1 PESHAWAR	2-2 SAIDU SHARIF	3-1 KOHAT	3-2 PARACHINAR	4 MANSEHRA	5 D.I KHAN	6 BANNU	7 CHITRAL	10 ISLAMABAD	11 MANGLA	13 BHAGTAN-WALA	14 MIANWALI
2-1 PESHAWAR		F: 3 4,066				N: 1 F: 5 8,380	F: 4 4,505	F: 16 20,226	N: 3 F: 11 27,465			
2-2 SAIDU SHARIF	F: 6 7,673							281	F: 8 10,665			
3-1 KOHAT									75			
3-2 PARACHINAR												
4 MANSEHRA									F: 6 7,735			
5 D.I KHAN	N: 1 F: 5 9,889								F: 3 4,215			
6 BANNU	F: 7 8,457											
7 CHITRAL	F: 16 20,716	D: 1 442							276			
10 ISLAMABAD	N: 3 F: 11 29,306	F: 7 10,181	139		F: 6 7,706	F: 3 3,676		D: 1 360		F: 1 1,890	N: 2 F: 14 26,655	64
11 MANGLA									F: 1 1,900			
13 BHAGTANWALA									N: 2 F: 15 26,562			
14 MIANWALI									76			
15 FAISALABAD									N: 4 F: 13 33,285			
17 LAHORE	WI: 1 WII: 2 N: 6 52,726				F: 2 8,412	F: 1 1,810			wi: 10 wII: 13 285,226	F: 2 2,063	N: 2 F: 16 29,097	45
21 D.G KHAN									F: 12 15,470			
23 MULTAN	F: 1 1,619					D: 1 840			F: 15 19,633			
25 BAHAWALPUR									F: 5 6,292			
26 WALTON									F: 7 10,775			
27 R.Y KHAN												
28 JACOBABAD												
29 SUKKUL									N: 1 4,087			
31 NAWABSHAH									60			
32 MOENJODARO												
33 HYDERABAD									F: 1 1,098			
34 SEHWAN SHARIF												
35-1 MIRPUR KHAS									78			
35-2 TALHAR												
39 KARACHI	WI: 8 WII: 10 135,977				F: 11 13,294			B: 18	WI: 16 WII: 14 456,188	F: 2 3,259	N: 5 F: 13 45,985	
40 QUETTA	F: 2 2,459					F: 1 1,353		WI: 7 WII: 9 N: 7	93,623			
41 ZHOB	F: 1 1,018					F: 3 3,387			F: 1 696			
42 DALBANDIN												
43-1 KHUZDAR												
43-2 KHARAN												
45-1 SUI												
45-2 SIBI												
46-1 PANJGUR												
46-2 TURBAT												
46-3 PASNI												
46-4 GWADAR												
46-5 JIWANI												
46-6 ORMARA												
47-1 GILGIT									N: 2 F: 8 19,978			
47-2 SKARDU									N: 6 F: 5 33,210			
48-1 RAWALAKOT									F: 4 5,447			
48-2 MUZAFFARABAD									F: 4 5,028			
TOTAL	269,870	14,699	139	0	29,412	19,446	4,505	20,967	1,069,133	7,212	101,737	109

Note B : B747 class wi : A300 class WII : A310 class
N : B737 class F : F27 class D : DHC-6 class

Source : JICA Study Team

	15 FAISALABAD	17 LAHORE	21 D.G KHAN	23 MULTAN	25 BAHAWAL-PUR	26 WALTON	27 R.Y KHAN	28 JACOBABAD	29 SUKKUL	31 NAWABS-HAH	32 MOENJODA-RO	33 HYDERABAD
2-1 PESHAWAR		WI: 1 WII: 2 N: 5 46,578		P: 3 1,631								
2-2 SAIDU SHARIF												
3-1 KOHAT												
3-2 PRACHINAR												
4 MANSEHRA		P: 7 8,443										
5 D.I KHAN		P: 2 2,898		P: 1 1,008								
6 BANNU												
7 CHITRAL												
10 ISLAMABAD	N: 3 P: 11 32,029	WI: 9 WII: 12 293,611	N: 25 15,411	P: 14 19,134	N: 1 P: 2 6,351	P: 8 10,729			N: 1 3,972	65		P: 1 1,195
11 MANGLA		P: 2 2,074										
13 BHAGTANWALA		N: 2 P: 16 28,996										
14 MIANWALI		92										
15 FAISALABAD												
17 LAHORE	53		P: 13 16,823	WI: 1 N: 12 66,564	N: 1 P: 6 11,792	P: 9 11,713	P: 8 10,273		P: 8 7,668			P: 2 3,052
21 D.G KHAN		P: 13 16,886										
23 MULTAN	N: 1 3,631	WI: 2 N: 13 71,763					P: 1 792		D: 1 533			
25 BAHAWALPUR		N: 1 P: 7 12,038							275			
26 WALTON		P: 7 11,762										
27 R.Y KHAN		P: 8 9,859		P: 1 765								
28 JACOBABAD									24	190		
29 SUKKUL		N: 2 7,829		634	353			537		112		550
31 NAWABSHAH								46	252		D: 1 589	
32 MOENJODARO								149	P: 1 1,739	395		P: 1 684
33 HYDERABAD		P: 2 3,151							D: 1 464		D: 1 624	
34 SEHWAN SHARIF												
35-1 MIRPUR KHAS		55									132	
35-2 TALHAR		P: 18 WI: 20 WII: 26										
39 KARACHI	WI: 2 N: 18 86,762	568,822	N: 3 P: 11 26,587	WI: 2 N: 18 95,770	P: 2 3,292	P: 14 18,510	N: 1 P: 7 11,974	P: 2 3,094	N: 20 84,397	P: 2 3,286	N: 1 P: 11 19,309	P: 1 1,760
40 QUETTA		WI: 2 N: 9 56,321							P: 1 1,462			
41 ZHOB				P: 2 3,150								
42 DALBANDIN												
43-1 KHUZDAR									118		P: 1 1,095	
43-2 KHARAN												
45-1 SUI									P: 1 1,040			
45-2 SIBI												
46-1 PANKUR												
46-2 TURBAT												
46-3 PASNI												
46-4 GWADAR												
46-5 JIWANI												
46-6 ORMARA												
47-1 GILGIT												
47-2 SKARDU												
48-1 RAWALAKOT												
48-2 MUZAFFARABAD												
TOTAL	122,473	1,141,178	58,821	188,656	21,788	40,952	23,039	3,826	101,944	4,048	21,749	7,241

	34 SEHWAN SHARIF	35-1 MIRPUR KHAS	35-2 TALHAR	39 KARACHI	40 QUETTA	41 ZHOB	42 DALBANDIN	43-1 KHUZDAR	43-2 KHARAN	45-1 SUI	45-2 SIBI	46-1 PANJGUR
2-1 PESHAWAR				WI: 8 WII: 11 145,026	P: 2 2,416	P: 1 1,402						
2-2 SAIDU SHARIF												
3-1 KOHAT												
3-2 PRACHINAR												
4 MANSEHRA				P: 11 13,344								
5 D.I KHAN					P: 1 1,528	P: 4 4,502						
6 BANNU												
7 CHITRAL												
10 ISLAMABAD		106	B: 16	WI: 35 WII: 13 451,694	WI: 8 WII: 2 N: 4 88,455	712						
11 MANGLA				P: 2 3,278								
13 BHAOTANWALA				N: 5 P: 18 45,326								
14 MIANWALI												
15 FAISALABAD				WI: 2 N: 16 88,875								
17 LAHORE		75	B: 18	WI: 20 WII: 26 573,803	WI: 2 N: 9 58,864							
21 D.G KHAN				N: 3 P: 11 26,688								
23 MULTAN				WI: 2 N: 16 86,603		P: 2 2,683						
25 BAHAWALPUR				P: 2 3,295								
26 WALTON				P: 12 16,586								
27 R.Y KHAN				N: 1 P: 8 12,502								
28 JACOBABAD				P: 4 4,491								
29 SUKKUL				N: 20 84,957	P: 2 2,390					P: 1 690		
31 NAWABSHAH				P: 2 3,200								
32 MOENJODARO		134		N: 1 P: 10 18,114				P: 1 1,098				
33 HYDERABAD				P: 1 1,509								
34 SEHWAN SHARIF												
35-1 MIRPUR KHAS				D: 1 626								
35-2 TALHAR												
39 KARACHI		D: 1 640			WI: 7 WII: 9 N: 7 146,717		D: 1 416	P: 1 753		P: 2 2,890		P: 11 13,800
40 QUETTA				WI: 7 WII: 9 N: 7 145,579		P: 1 1,562	D: 1 640	43				P: 2 2,883
41 ZHOB					P: 2 2,483							
42 DALBANDIN				D: 1 549	D: 1 665							
43-1 KHUZDAR				P: 2 1,069								
43-2 KHARAN												
45-1 SUI				P: 2 3,072								
45-2 SIBI												
46-1 PANJGUR				P: 11 13,391	P: 2 2,996							
46-2 TURBAT				N: 10 42,194	P: 7 8,320		P: 1 832	P: 1 990				P: 4 5,413
46-3 PASNI				N: 1 P: 8 14,130								D: 1 543
46-4 GWADAR				N: 4 P: 12 29,868	80							P: 1 959
46-5 JIWANI				P: 1 2,006								
46-6 ORMARA				P: 2 3,194								
47-1 GILGIT												
47-2 SKARDU												
48-1 RAWALAKOT												
48-2 MUZAFFARABAD												
TOTAL	0	955	0	1,837,473	314,904	10,961	1,888	2,584	0	3,580	0	23,598

	46-2 TURBAT	46-3 PASNI	46-4 GWADAR	46-5 JIWANI	46-6 ORMARA	47-1 GILGIT	47-2 SKARDU	48-1 RAWALAK-OT	48-2 MUZAFFAR-ABAD	TOTAL
2-1 PESHAWAR										261,695
2-2 SAIDU SHARIF										18,619
3-1 KOHAT										75
3-2 PEACHINAR										0
4 MANSEHRA										29,522
5 D.I KHAN										24,040
6 BANNU										8,487
7 CHITRAL										21,434
10 ISLAMABAD						N: 2 P: 8 22,501	N: 6 P: 5 34,051	P: 4 4,589	P: 4 4,661	1,069,243
11 MANGLA										7,252
13 BHAGTANWALA										101,384
14 MIANWALI										168
15 FAISALABAD										122,160
17 LAHORE										1,140,057
21 D.G KHAN										59,044
23 MULTAN										188,097
25 BAHAWALPUR										21,900
26 WALTON										41,125
27 R.Y KHAN										23,126
28 JACOBABAD										4,705
29 SUKKUL										102,139
31 NAWABSHAH										4,147
32 MOHENJODARO										22,313
33 HYDERABAD										6,846
34 SEHWAN SHARIF										0
35-1 MIRPUR KHAS										895
35-2 TALHAR										0
39 KARACHI	N: 9 39,546	N: 1 P: 10 17,636	N: 4 P: 12 29,137	P: 1 1,433	P: 2 3,121					1,834,359
40 QUETTA	P: 7 8,547		78							314,550
41 ZHOB										10,724
42 DALBANDIN	P: 1 845									2,059
43-1 KHUZDAR	P: 1 910									3,192
43-2 KHARAN										0
45-1 SUI										4,112
45-2 SIBI										0
46-1 PANJGUR	P: 5 5,944	326	P: 1 2,013							24,660
46-2 TURBAT		P: 4 4,868	P: 4 4,436	D: 1 353	334					67,740
46-3 PASNI	P: 1 1,739		D: 1 526		D: 1 466					17,404
46-4 GWADAR	P: 5 6,641	P: 1 720		159						38,427
46-5 JIWANI	292		123							2,421
46-6 ORMARA	D: 1 426	D: 1 531								4,151
47-1 GILGIT							D: 1 260			20,236
47-2 SKARDU						D: 1 489				33,699
48-1 RAWALAKOT									F: 1 371	F: 1 5,818
48-2 MUZAFFARABAD								F: 1 901		5,929
TOTAL	64,892	24,083	36,313	1,945	3,921	22,990	34,311	5,490	5,032	5,667,954

Appendix Table 9.2.3 Annual Passengers and Weekly Aircraft Movements by Route (Domestic), 2005-06, O-D Table (1)

	2-1 PESHAWAR	2-2 SAIDU SHARIF	3-1 KOHAT	3-2 PARACHINAR	4 MANSEHRA	5-1 D.I KHAN	5-2 WANA	6 BANNU	7 CHITRAL	10 ISLAMABAD	11 MANOLA
2-1 PESHAWAR		F: 4 6,758				N: 1 F: 4 9,808		F:3 5,063	F: 15 24,847	N:5 F: 14 44,272	
2-2 SAIDU SHARIF	F: 8 12,753								345	F: 11 17,192	
3-1 KOHAT										92	
3-2 PARACHINAR											
4 MANSEHRA										F: 6 9,392	
5-1 D.I KHAN	N: 1F: 5 12,147									F: 3 5,178	
5-2 WANA											
6 BANNU	F: 7 10,426										
7 CHITRAL	F: 16 25,448	543								340	
10 ISLAMABAD	N: 5 F: 15 47,453	F: 10 16,485	171		F: 6 9,379	F: 3 4,348			D: 1 442		F: 2 4,002
11 MANOLA										F: 2 4,007	
13 BHAQTANWALA										N: 2 F: 15 33,767	
14 MIANWALI										93	
15 FAISALABAD										N: 6 F: 8 42,979	
17 LAHORE	W1: 3 WII: 4 N: 7 81,949				F: 6 10,238	F: 3 2,100				W1: 33 WII: 20 446,780	N: 1 4,369
20 SIALKOT										N: 2 F: 16 36,008	
23 D.G KHAN										F: 16 27,057	
23 MULTAN	F: 1 2,474					F: 1 951				F: 19 30,238	
25 BAHAWALPUR										F: 18 12,159	
26 WALTON										F: 12 19,331	
27 R.Y KHAN											
28 JACOBABAD											
29 SUKKUL	17									N: 2 6,719	
31-1 NAWABSHAH										74	
31-2 NAUSHERO FEROZ											
32 MOENJODARO											
33 HYDERABAD										F: 1 1,454	
34 SEHWAN SHARIF										F: 4 6,192	
35-1 MIRPUR KHAS										96	
35-2 TALHAR											
36 BHIT SHAH											
39 KARACHI	W1: 16 WII: 10 224,516				F:10 16,182					B: 26 W1: 24 759,479	WII: 23 6,905
40 QUETTA	F: 4 5,573					F: 1 2,238				W1: 22 213,867	
41-1 ZHOB	F: 1 1,251					F: 2 4,160				F: 1 842	
41-2 LORALAI											
42 DALBANDIN											
43-1 KHUZDAR											
43-2 KHARAN											
45-1 SUI											
45-2 SIBI											
46-1 PANGUR											
46-2 TURBAT											
46-3 PASNI											
46-4 GWADAR											
46-5 JIWANI											
46-6 ORMARA											
47-1 GILGIT										N: 2 F: 8 24,541	
47-2 SKARDU										N: 7 F: 5 40,797	
47-3 CHILLAS											
48-1 RAWALAKOT										F: 4 6,691	
48-2 MUZAFFARABAD										F: 4 6,177	
TOTAL	424,007	23,786	171	0	35,799	23,605	0	5,063	25,634	1,797,794	15,276

Note B : B747 class w1 : A300 class WII : A310 class
N : B737 class F : F27 class D : DHC-6 class
Source : JICA Study Team

	13 BHAGTANWALA	14 MIANWALI	15 FAISALABAD	17 LAHORE	20 SIALKOT	21 D.G KHAN	23 MULTAN	25 BAHAWALPUR	26 WALTON	27 R.Y KHAN	28 JACOBABAD
2-1 PESHAWAR				Wt: 2 Wt: 3 F: 6 72,252			F: 1 2,475				
2-2 SAIDU SHARIF											
3-1 KOHAT											
3-2 PRACHINAR											
4 MANSEHRA				F: 6 10,253							
5-1 D.I KHAN				F: 2 3,560			F: 1 1,238				
5-2 WANA											
6 BANNU											
7 CHITRAL				Wt: 24 Wt: 21 N: 19							
10 ISLAMABAD	N: 2 F: 15 33,722	79	N: 6 F: 8 41,543	461,253	N: 2 F: 16 35,961	F: 17 27,013	N: 2 F: 13 29,387	F: 8 12,273	F: 12 19,312		
11 MANOLA				F: 3 4,374							
13 BHAGTANWALA				N: 2 F: 17 36,861							
14 MIANWALI				113							
15 FAISALABAD											
17 LAHORE	N: 1 F: 19 36,810	56	62		N: 2 F: 17 39,256	F: 19 29,457	Wt: 2 N: 16 98,083	N: 1 F: 9 21,822	F: 13 21,051	F: 12 18,329	
20 SIALKOT				N: 2 F: 17 39,306							
21-1 RAJANPUR				F: 17 29,514							
23 MULTAN			N: 1 4,445	Wt: 3 N: 15 106,352						F: 1 1,392	
25 BAHAWALPUR				N: 1 F: 10 22,352							
26 WALTON				F: 13 21,103							
27 R.Y KHAN				F: 11 17,598			1,337				
28 JACOBABAD											
29 SUKKUR				N: 4 16,065			1,271	886		18	759
31-1 NAWABSHAH											57
31-2 NAUSHERO FEROZ											
32 MOHENJODARO											183
33 HYDERABAD				F: 2 3,920							
34 SEHWAN SHARIF				F: 4 6,760							
35-1 MIRPUR KHAS				67							
35-2 TALHAR											
36 BHIT SHAH											
39 KARACHI	N: 6 F: 18 58,176		Wt: 4 N: 17 114,740	B: 44 Wt: 28 911,332	N: 6 F: 19 62,041	N: 5 F: 15 46,602	Wt: 5 N: 22 149,952	F: 4 6,454	F: 21 33,315	F: 14 22,751	F: 2 3,801
40 QUETTA				Wt: 2 Wt: 4 N: 15 123,789			17	25		23	
41-1 ZHOB							F: 2 3,870				
41-2 LORALAI											
42 DALBANDIN											
43-1 KHUZDAR											
43-2 KHARAN											
45-1 SUI											
45-2 SIBI											
46-1 PANJGUR											
46-2 TURBAT											
46-3 PASNI											
46-4 GWADAR											
46-5 JIWANI											
46-6 ORMARA											
47-1 GILGIT											
47-2 SKARDU											
47-3 CHILLAS											
48-1 RAWALAKOT											
48-2 MUZAFFARABAD											
TOTAL	128,708	135	160,790	1,886,624	137,258	103,102	287,660	41,490	73,711	42,513	4,800

(3)

	29 SUKKUL	31-1 NAWABSHAH	31-2 NAUSHERO FEROZ	32 MOENJODARO	33 HYDERABAD	34 SEHWAN SHARIF	35-1 MIRPUR KHAS	35-2 TALHAR	36 BHITSHAH	39 KARACHI	40 QUETTA
2-1 PESHAWAR	17									WI: 18 WII: 11 298,911	F: 4 5,460
2-2 SAIDU SHARIF											
3-1 KOHAT											
3-2 PRACHINAR											
4 MANSEHRA										F: 10 16,204	
5-1 D.I KHAN											F: 2 2,549
5-2 WANA											
6 BANNU											
7 CHITRAL											
10 ISLAMABAD	N: 2 8,551	80			F: 2 1,553	F: 4 6,186	130			B: 26 WI: 23 WII: 22 753,804	WI: 21 202,534
11 MANGLA										F: 4 6,914	
13 BHAGTANWALA										N: 6 F: 18 58,255	
14 MIANWALI											
15 FAISALABAD										WI: 4 N: 17 117,301	
17 LAHORE	N: 3 15,823				F: 2 3,749	F: 1 6,752	92			B: 45 WI: 29 918,720	WI: 3 WII: 4 N: 16 129,308
20 SIALKOT										N: 6 F: 19 62,120	
21-1 RAJANPUR										N: 5 F: 14 46,644	
23 MULTAN	F: 1 1,081									WI: 4 N: 20 136,335	17
25 BAHAWALPUR	695									F: 4 6,511	23
26 WALTON										F: 21 33,351	
27 R.Y KHAN	39									F: 15 23,751	22
28 JACOBABAD	36	233								F: 4 5,517	
29 SUKKUL		161			F: 1 1,002					WI: 6 WII: 21 195,299	F: 5 7,354
31-1 NAWABSHAH	D: 1 369			D: 1 723						F: 2 3,931	
31-2 NAUSHERO FEROZ											
32 MOENJODARO	F: 2 2,604	485			F: 1 840		165			N: 1 F: 10 22,252	
33 HYDERABAD	F: 1 850	0		D: 1 766						F: 1 2,110	
34 SEHWAN SHARIF										F: 7 10,683	
35-1 MIRPUR KHAS				162						D: 1 771	
35-2 TALHAR											
36 BHIT SHAH											
39 KARACHI	WI: 6 WII: 19 185,164	F: 2 4,037		N: 1 F: 11 73,719	F: 1 2,342	F: 7 10,673	D: 1 787				WI: 25 WII: 15 342,535
40 QUETTA	F: 3 4,403									WI: 25 WII: 15 339,901	
41-1 ZHOB											F: 2 3,946
41-2 LORALAI											
42 DALBANDIN										D: 1 674	F: 1 916
43-1 KHUZDAR	184			F: 1 1,345						F: 1 1,313	
43-2 KHARAN											
45-1 SUI	F: 1 1,395									F: 2 3,774	
45-2 SIBI											
46-1 PANJGUR										F: 10 15,746	F: 3 4,817
46-2 TURBAT										N: 11 49,614	F: 8 13,423
46-3 PASNI										N: 2 F: 5 16,614	
46-4 GWADAR										N: 2 F: 15 35,120	130
46-5 JIWANI										F: 1 2,359	
46-6 ORMARA										F: 2 3,756	
47-1 GILGIT											
47-2 SKARDU											
47-3 CHILLAS											
48-1 RAWALAKOT											
48-2 MUZAFFARABAD											
TOTAL	221,214	4,996	0	26,715	9,456	23,609	1,174	0	0	3,118,254	712,534

	41-1 ZHOB	41-2 LORALAI	42 DALBANDIN	43-1 KHUZDAR	43-2 KHARAN	45-1 SUI	45-2 SIBI	46-1 PANGUR	46-2 TURBAT	46-3 PASNI	46-4 GWADAR
2-1 PESHAWAR	F: 1 1,722										
2-2 SAIDU SHARIF											
3-1 KOHAT											
3-2 PRACHINAR											
4 MANSEHRA											
5-1 D.I KHAN	F: 4 5,530										
5-2 WANA											
6 BANNU											
7 CHITRAL											
10 ISLAMABAD	F: 1 875										
11 MANGLA											
13 BHAOTANWALA											
14 MIANWALI											
15 FAISALABAD											
17 LAHORE											
20 SIALKOT											
21-1 RAJANPUR											
23 MULTAN	F: 2 3,296										
25 BAHAWALPUR											
26 WALTON											
27 R.Y KHAN											
28 JACOBABAD											
29 SUKKUL						F: 1 959					
31-1 NAWABSHAH											
31-2 NAUSHERO FEROZ											
32 MOHENJODARO				F: 1 1,349							
33 HYDERABAD											
34 SEHWAN SHARIF											
35-1 MIRPUR KHAS											
35-2 TALHAR											
36 BHIT SHAH											
39 KARACHI			D: 1 511	F: 1 925		F: 2 3,550		F: 30 16,205	N: 10 46,438	N: 2 F: 6 20,712	N: 2 F: 15 34,213
40 QUETTA	F: 2 2,541		F: 1 962	75				F: 3 4,646	F: 9 13,773		126
41-1 ZHOB											
41-2 LORALAI											
42 DALBANDIN									F: 1 1,038		
43-1 KHUZDAR									F: 1 1,118		
43-2 KHARAN											
45-1 SUI											
45-2 SIBI											
46-1 PANGUR									F: 6 9,879	D: 1 541	F: 2 3,346
46-2 TURBAT			F: 1 1,023	F: 1 1,216				F: 6 8,996		F: 5 8,091	F: 5 7,372
46-3 PASNI								F: 1 903	F: 2 2,890		F: 1 874
46-4 GWADAR								F: 1 1,594	F: 7 11,037	F: 1 1,196	
46-5 JIWANI									D: 1 485		204
46-6 ORMARA									D: 1 709	F: 1 883	
47-1 GILGIT											
47-2 SKARDU											
47-3 CHILLAS											
48-1 RAWALAKOT											
48-2 MUZAFFARABAD											
TOTAL	13,964	0	2,496	3,565	0	4,509	0	32,344	87,367	31,423	46,135

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	46-5 JIWANI	46-6 ORMARA	47-1 GILGIT	47-2 SKARDU	47-3 CHILLAS	48-1 RAWALAKOT	48-2 MUZAFFARABAD	TOTAL
2-1 PESHAWAR								411,595
2-2 SAIDU SHARIF								30,290
3-1 KOHAT								92
3-2 PRACHINAR								0
4 MANSEHRA								35,949
5-1 D.I KHAN								30,202
5-2 WANA								0
6 BANNU								10,426
7 CHITRAL								26,331
10 ISLAMABAD			N: 3 P: 9 27,641	N: 6 P: 8 41,830		P: 4 5,637	P: 4 5,726	1,797,370
11 MANGLA								15,295
13 BHAGTANWALA								128,883
14 MIANWALI								206
15 FAISALABAD								160,280
17 LAHORE								1,896,866
20 SIALKOT								137,434
21-1 RAJANPUR								103,195
23 MULTAN								286,581
25 BAHAWALPUR								41,740
26 WALTON								73,785
27 R.Y KHAN								42,727
28 JACOBABAD								5,786
29 SUKKUL								222,309
31-1 NAWABSHAH								5,154
31-2 NAUSHERO FEROZ								0
32 MOENJODARO								27,878
33 HYDERABAD								9,100
34 SEHWAN SHARIF								23,635
35-1 MIRPUR KHAS								1,096
35-2 TALHAR								0
36 BHIT SHAH								0
39 KARACHI	P: 1 1,693	P: 1 3,663						3,113,284
40 QUETTA								713,959
41-1 ZHOB								14,069
41-2 LORALAI								0
42 DALBANDIN								2,628
43-1 KHUZDAR								3,960
43-2 KHARAN								0
45-1 SUI								5,172
45-2 SBH								0
46-1 PANGUR								34,329
46-2 TURBAT	D: 1 587	D: 1 556						90,878
46-3 PASNI		D: 1 774						22,055
46-4 GWADAR	265							49,342
46-5 JIWANI								3,046
46-6 ORMARA								5,348
47-1 GILGIT				D: 1 432				24,973
47-2 SKARDU			D: 1 813					41,610
47-3 CHILLAS								0
48-1 RAWALAKOT							D: 1 617	7,308
48-2 MUZAFFARABAD						P: 1 1,697		7,674
TOTAL	2,535	4,993	28,454	42,262	0	7,334	6,343	9,649,732

Appendix Table 9.2:4 Annual Passengers and Daily Aircraft Movements by Route (International), 1997-98

(TOTAL)

Route \ Airport		Quetta	Gwadar	Karachi	Lahore	Peshawar	Islamabad	Total
		14,000	15,000	2,151,690	356,800	127,810	477,300	3,142,600
Middle East	B			3.20	0.65		2.25	
and Africa	WI			9.50	1.90	0.80	0.65	
	WII	0.15		4.90	0.40	0.45	0.25	
	N		0.25	1.90				
		0	0	547,560	123,000	19,840	123,000	813,400
	B			2.10	0.75		0.60	
Europe	WI			0.50		0.10	0.20	
	WII			1.25		0.15		
	N			0.50				
		0	0	455,700	46,500	0	31,000	533,200
	B			0.80				
Far East	WI			1.20	0.40		0.10	
	WII			2.05			0.25	
	N							
		0	0	488,050	28,700	14,350	28,700	559,800
	B			0.15				
Regional	WI			2.60				
	WII			0.85	0.15	0.15	0.25	
	N			1.70	0.25		0.15	
		14,000	15,000	3,643,000	555,000	162,000	660,000	5,049,000
	B	0.00	0.00	6.25	1.40	0.00	2.85	
Total	WI	0.00	0.00	13.80	2.30	0.90	0.95	
	WII	0.15	0.00	9.05	0.55	0.75	0.75	
	N	0.00	0.25	4.10	0.25	0.00	0.15	

Note: B : B747 Class WI : A300 Class
WII : A310 Class N : B-737 Class

(PIA)

Route \ Airport		Quetta	Gwadar	Karachi	Lahore	Peshawar	Islamabad	Total
		14,000	15,000	812,490	178,240	127,810	209,460	1,357,000
Middle East	B			1.20	0.30		1.00	
and Africa	WI	0.15		3.60	0.95	0.80	0.30	
	WII			1.85	0.20	0.45	0.10	
	N		0.25	0.70				
				369,000	123,000		123,000	615,000
	B			1.45	0.75		0.60	
Europe	WI			0.35			0.20	
	WII			0.85				
	N			0.35				
				232,500	46,500		31,000	310,000
	B			0.40				
Far East	WI			0.60	0.40		0.10	
	WII			1.05			0.25	
	N							
				215,250	28,700	14,350	28,700	287,000
	B			0.05				
Regional	WI			1.15				
	WII			0.35	0.15	0.15	0.25	
	N			0.75	0.25		0.15	
		14,000	15,000	1,629,240	376,440	142,160	392,160	2,569,000
	B	0.00	0.00	3.10	1.05	0.00	1.60	
Total	WI	0.15	0.00	5.70	1.35	0.80	0.60	
	WII	0.00	0.00	4.10	0.35	0.60	0.60	
	N	0.00	0.25	1.80	0.25	0.00	0.15	

Note: B : B747 Class WI : A300 Class
WII : A310 Class N : B-737 Class

(Foreign Carrier)

Route \ Airport		Quetta	Gwadar	Karachi	Lahore	Peshawar	Islamabad	Total
				1,339,200	178,560		267,840	1,785,600
Middle East and Africa	B			2.00	0.30		1.30	
	WI			5.90	0.95		0.35	
	WII			3.05	0.20		0.15	
	N			1.20				
				178,560		19,840		198,400
	B			0.70				
Europe	WI			0.15				
	WII			0.40		0.10		
	N			0.15		0.15		
				223,200				223,200
	B			0.40				
Far East	WI			0.60				
	WII			1.00				
	N							
				272,800				272,800
	B			0.10				
Regional	WI			1.45				
	WII			0.45				
	N			0.95				
				2,013,760	178,560	19,840	267,840	2,480,000
	B	0.00	0.00	3.20	0.30	0.00	1.30	
Total	WI	0.00	0.00	8.10	0.95	0.00	0.35	
	WII	0.00	0.00	4.90	0.20	0.10	0.15	
	N	0.00	0.00	2.30	0.00	0.15	0.00	

Note: B : B747 Class WI : A300 Class
WII : A310 Class N : B-737 Class

Appendix Table 9.2.5 Annual Passengers and Daily Aircraft Movements by Route (International), 2005-06

(TOTAL)

Route \ Airport		Quetta	Gwadar	Karachi	Lahore	Peshawar	Islamabad	Total
		19,000	21,000	2,910,696	453,550	181,594	625,200	4,211,040
Middle East and Africa	B			4.60	0.95		2.65	
	WI			12.70	1.80	1.00	0.75	
	WII	0.20		3.30	0.50	0.60	0.35	
	N		0.35	2.30				
		0	0	851,904	206,400	25,856	206,400	1,290,560
	B			2.95	1.10		0.85	
Europe	WI			1.00		0.15	0.35	
	WII			1.95		0.10		
	N							
		0	0	660,630	73,950	0	49,300	783,880
	B			1.20				
Far East	WI			1.85	0.60		0.15	
	WII			2.25			0.35	
	N							
		0	0	678,770	43,100	21,550	43,100	786,520
	B			0.35				
Regional	WI			3.50	0.35	0.10	0.25	
	WII			1.55	0.20	0.10	0.15	
	N			0.55				
		19,000	21,000	5,102,000	777,000	229,000	924,000	7,072,000
	B	0.00	0.00	9.10	2.05	0.00	3.50	
Total	WI	0.00	0.00	19.05	2.75	1.25	1.50	
	WII	0.20	0.00	9.05	0.70	0.80	0.85	
	N	0.00	0.35	2.85	0.00	0.00	0.00	

Note: B : B747 Class WI : A300 Class
WII : A310 Class N : B-737 Class

(PIA)

Route \ Airport		Quetta	Gwadar	Karachi	Lahore	Peshawar	Islamabad	Total
		19,000	21,000	1,165,416	220,846	181,594	276,144	1,884,000
Middle East and Africa	B			1.85	0.45		1.15	
	WI			5.10	0.90	1.00	0.35	
	WII	0.20		1.30	0.25	0.60	0.15	
	N		0.35	0.90				
				619,200	206,400		206,400	1,032,000
Europe	B			2.15	1.10		0.85	
	WI			0.75			0.35	
	WII			1.40				
	N							
				369,750	73,950		49,300	493,000
Far East	B			0.70				
	WI			1.05	0.60		0.15	
	WII			1.25			0.35	
	N							
				323,250	43,100	21,550	43,100	431,000
Regional	B			0.15				
	WI			1.65		0.10		
	WII			0.75	0.35	0.10	0.25	
	N			0.25	0.20		0.15	
		19,000	21,000	2,477,616	544,296	203,144	574,944	3,840,000
Total	B	0.00	0.00	4.85	1.55	0.00	2.00	
	WI	0.00	0.00	8.55	1.50	1.10	0.85	
	WII	0.20	0.00	4.70	0.60	0.70	0.75	
	N	0.00	0.35	1.15	0.20	0.00	0.15	

Note: B : B747 Class WI : A300 Class
WII : A310 Class N : B-737 Class

(Foreign Carrier)

Route \ Airport		Quetta	Gwadar	Karachi	Lahore	Peshawar	Islamabad	Total
				1,745,280	232,704		349,056	2,327,040
Middle East and Africa	B			2.75	0.50		1.50	
	WI			7.60	0.90		0.40	
	WII			2.00	0.25		0.20	
	N							
				232,704		25,856		258,560
Europe	B			0.80				
	WI			0.30		0.15		
	WII			0.55		0.10		
	N							
				290,880				290,880
Far East	B			0.55				
	WI			0.80				
	WII			1.00				
	N							
				355,520				355,520
Regional	B			0.20				
	WI			1.85				
	WII			0.80				
	N			0.30				
				2,624,384	232,704	25,856	349,056	3,232,000
Total	B	0.00	0.00	4.30	0.50	0.00	1.50	
	WI	0.00	0.00	10.55	0.90	0.15	0.40	
	WII	0.00	0.00	4.35	0.25	0.10	0.20	
	N	0.00	0.00	0.30	0.00	0.00	0.00	

Note: B : B747 Class WI : A300 Class
WII : A310 Class N : B-737 Class

Appendix Table 9.2.6 Air Traffic Volume (Domestic), 1997-98

Location	Airport	Passengers		Annual Cargo	Daily Aircraft Movement						
		Annual Pax.	Peak Hour	(ton)	L	WI	WII	S	F	D	Total
Balo-chistan	Quetta	629,454	420	1,975		5.0	3.3	5.8	4.1	0.3	18.4
	Gwadar	74,740	90	94				1.0	5.2		6.2
	Jiwani	4,366	40	8					0.4	0.2	0.6
	Khuzdar	6,076	40	44					0.7	0.1	0.8
	Panjgur	48,258	60	100					5.4	0.1	5.6
	Pasni	41,487	80	149				0.3	2.6	0.7	3.6
	Sui	7,692	50	11					0.9		0.9
	Turbat	132,632	130	359				2.8	5.5	0.3	8.6
	Zhob	21,585	60	26					2.4		2.4
	Dalbandin	3,947	30	2					0.2	0.5	0.7
	Ormara	8,072	40	11					0.7	0.4	1.1
	Sibi	0	0	0							
	Kharan	0	0	0							
Sindh	Karachi	3,671,832	1,630	52,420	10.2	15.6	16.5	24.1	34.6	0.5	101.3
	Hyderabad	14,087	50	153					1.3	0.5	1.8
	Moenjodaro	44,062	70	141				0.4	3.7	0.1	4.2
	Nawabshah	8,195	40	6					0.7	0.4	1.1
	Sukkur	204,083	220	463				6.4	1.2		7.6
	Jacobabad	8,531	50	17					1.0		1.0
	Mirpur Khas	1,848	20	1						0.4	0.4
	Talhar	0	0	0							
	Sehwan Sharif	0	0	0							
Punjab	Islamabad	2,138,376	1,000	19,318	4.7	9.1	7.8	13.5	31.3	0.3	66.7
	Lahore	2,281,235	1,080	29,233	5.1	9.9	11.6	16.9	18.5		62.0
	Faisalabad	244,633	220	1,358		0.6		5.8	3.7		10.1
	Multan	376,753	270	1,191		1.0		8.6	5.5	0.6	15.8
	Mianwali	277	0	0							
	Bahawalpur	43,688	70	16				0.2	4.1		4.4
	R.Y.Khan	46,165	70	58				0.2	4.6		4.8
	Bhagtanwala	203,121	140	2,876				2.6	13.8		16.4
	Mangla	14,464	50	0					1.6		1.6
	Walton	82,077	90	705					7.3		7.3
	D.G Khan	117,865	100	1,420				0.9	10.2		11.1
N.W.F.P	Peshawar	531,565	340	3,923		2.7	3.7	2.6	12.0		21.0
	Chitral	42,301	60	69					4.6	0.3	4.9
	D.I.Khan	43,486	60	134				0.2	4.7		4.9
	Saidu Sharif	33,308	50	73					4.2		4.2
	Bannu	12,992	40	11					1.9		1.9
	Kohat	214	0	0							
	Prachinar	0	0	0							
	Mansehra	58,934	70	710					6.6		3.6
Northern Area	Gilgit	43,228	90	50				0.7	2.2	0.1	3.0
	Skardu	68,010	130	290				1.8	1.5	0.2	3.5
	Muzaffarabad	10,961	50	5					1.3		1.3
	Rawalakot	11,308	50	4					1.2	0.2	1.4
Total		11,335,908		117,424	20.0	43.9	42.9	94.8	211.4	6.2	416.2

Source: JICA Study Team

Appendix Table 9.2.7 Air Traffic Volume (Domestic), 2005-06

Location	Airport	Passengers		Annual Cargo	Daily Aircraft Movement						
		Annual Pax.	Peak Hour	(ton)	L	WI	WII	S	F	D	Total
Balo-chistan	Quetta	1,424,793	800	2,520		14.2	5.4	4.4	6.1	0.1	30.1
	Gwadar	95,477	100	117				0.6	6.9	0.1	7.6
	Jiwani	5,583	40	11					0.4	0.3	0.7
	Khuzdar	7,525	50	53					0.7	0.1	0.8
	Panjgur	66,673	80	121					6.0	0.2	6.2
	Pasni	53,478	110	192				0.5	2.3	0.3	3.2
	Sui	9,681	60	13					0.9		0.9
	Turbat	178,245	160	454				3.0	7.2	0.5	10.6
	Zhob	28,033	70	30					2.5		2.5
	Dalbandin	5,124	40	2					0.3	0.3	0.6
	Ormara	10,341	50	13					0.8	0.3	1.1
	Sibi	0	0	0							
	Kharan	0	0	0							
	Loralai	0	0	0							
Sindh	Karachi	6,231,538	2,680	89,543	20.2	30.7	19.2	20.4	47.6	0.6	138.8
	Hyderabad	18,586	60	190					1.5	0.3	1.8
	Moenjodaro	54,593	90	164				0.4	3.8	0.1	4.2
	Nawabshah	10,150	50	7					1.0	0.8	1.2
	Sukkur	443,523	370	547		1.8	5.9	1.6	2.3		11.5
	Jacobabad	10,586	60	21					1.0		1.0
	Mirpur Khas	2,270	30	1						0.5	0.5
	Talhar	0	0	0							
	Sehwan Sharif	47,244	80	258					4.2		4.2
	Bhit Shah	0	0	0							
	Naushero Feroz	0	0	0							
Punjab	Islamabad	3,595,164	1,600	33,285	7.5	19.6	12.3	13.5	43.7	0.3	96.9
	Lahore	3,771,490	1,720	49,049	12.8	19.6	7.8	14.2	28.1		82.5
	Faisalabad	321,070	290	1,794		1.0		6.7	2.3		10.0
	Multan	574,241	380	1,814		2.2		10.4	7.0		19.6
	Mianwali	341	0	0							
	Bahawalpur	83,230	100	19				0.4	6.3		6.7
	R.Y.Khan	85,240	90	73				0.2	7.6		7.8
	Bhagtanwala	257,591	180	3,576				0.3	14.0		17.0
	Mangla	30,571	70	0					2.7		2.7
	Walton	147,496	120	1,934					13.2		13.2
	D.G Khan	206,297	150	3,079				1.3	13.3		14.6
	Sialkot	274,692	190	3,868				3.2	15.0		18.2
N.W.F.P	Peshawar	835,592	490	6,256		5.6	4.0	3.2	13.5		26.3
	Chitral	51,965	80	84					4.6	0.2	4.8
	D.I.Khan	53,807	70	154				0.2	4.7		5.0
	Saidu Sharif	54,076	70	94					5.4		5.4
	Bannu	15,489	50	14					1.9		1.9
	Kohat	263	60	0							
	Prachinar	0	0	0							
	Manschra	71,648	90	768					6.4		6.4
	Wana	0	0	0							
Northern Area	Gilgit	53,427	110	60				0.7	2.2	0.2	3.1
	Skardu	83,872	150	351				1.9	1.5	0.4	3.8
	Muzaffarabad	14,017	60	5					1.4		1.4
	Rawalakot	14,442	60	6					1.2		1.2
	Chillas	0	0	0							
Total		19,299,464		200,540	40.5	94.7	54.6	87.1	291.5	5.6	576.0

Source: JICA Study Team

Appendix Table 9.2.8 Air Traffic Volume (International), 1997-98

Airport	Passengers		Annual Cargo	Daily Aircraft Movement						
	Annual Pax.	Peak Hour	(ton)	L	WI	WII	S	F	D	Total
Quetta	14,000	80	180		0.3					0.3
Gwadar	15,000	50	34				0.5			0.5
Karachi	3,279,000	1,760	138,038	12.6	27.5	18.0	8.2			66.3
" Transit	364,000	200								
Lahore	555,000	400	10,660	2.7	4.6	1.1	0.5			9.0
Peshawar	162,000	160	1,476		1.6	1.4	0.3			3.3
Islamabad	660,000	450	13,612	5.7	1.9	1.5	0.3			9.4
Total	5,049,000		164,000	21.0	35.9	22.0	9.8	0.0	0.0	88.8

Source : JICA Study Team

Appendix Table 9.2.9 Air Traffic Volume (International), 2005-06

Airport	Passengers		Annual Cargo	Daily Aircraft Movement						
	Annual Pax.	Peak Hour	(ton)	L	WI	WII	S	F	D	Total
Quetta	19,000	80	271			0.2				0.2
Gwadar	21,000	60	49				0.7			0.7
Karachi	4,592,000	2,450	207,058	18.3	38.1	18.0	5.7			80.1
" Transit	510,000	270								
Lahore	777,000	510	15,990	4.1	4.8	1.7	0.4			11.0
Peshawar	229,000	210	2,214		2.5	1.7				4.1
Islamabad	924,000	600	20,418	7.0	2.9	1.7				11.6
Total	7,072,000		246,000	29.4	48.3	23.3	6.8	0.0	0.0	107.7

Source : JICA Study Team

Appendix Table 9.2.10 Required Runway Length and Width, 1997-98

	Airport	Existing Condition (1993-94)		Required (1997-98)		Remarks
		Runway Length (m)	Maximum Operated Aircraft	Runway Length (m)	Maximum Operate Aircraft	
Balo-chistan	Quetta	3,658 x 46	A-300	3,658 x 46	A-300	Existing
	Gwadar	1,524 x 23	F-27	2,286 x 30	B-737	Extension
	Jiwani	1,783 x 46	F-27	1,783 x 46	F-27	Existing
	Khuzdar	1,829 x 30	F-27	1,829 x 30	F-27	"
	Panjgur	1,524 x 23	F-27	1,524 x 23	F-27	"
	Pasni	2,743 x 46	B-737	2,743 x 46	B-737	"
	Sui	1,524 x 46	F-27	1,524 x 46	F-27	"
	Turbat	1,829 x 30	F-27	2,286 x 30	B-737	Extension
	Zhob	1,829 x 30	F-27	1,829 x 30	F-27	Existing
	Dalbandin	1,524 x 23	C-130	1,524 x 23	F-27	"
	Ormara	1,524 x 25	F-27	1,524 x 25	F-27	"
	Sibi	1,829 x 23	-	1,829 x 23	-	"
	Kharan	-	-	-	-	New Airport
Sindh	Karachi	3,200 x 46	B-747	3,200 x 46	B-747	Existing
	"	2,286 x 46	F-27	3,400 x 45	B-747	Extension
	Hyderabad	2,133 x 30	F-27	2,133 x 30	F-27	Existing
	Moenjodaro	1,981 x 30	F-27	2,743 x 30	B-737	Extension
	Nawabshah	2,743 x 46	F-27	2,743 x 46	F-27	Existing
	Sukkur	2,743 x 30	B-737	2,743 x 46	B-737 (B-747)	Widening
	Jacobabad	3,048 x 30	F-27	3,048 x 30	F-27	Existing
	Mirpur Khas	3,048 x 46	F-27	3,048 x 46	F-27	"
	Talhar	2,743 x 23	-	2,743 x 23	-	"
	Sehwan Sharif	-	-	-	-	New Airport
Punjab	Islamabad	2,743 x 46	B-747	3,350 x 46	B-747	Extension (On going)
	Lahore	3,360 x 46	B-747	3,360 x 46	B-747	Existing
	"	2,743 x 46	A-300	2,743 x 46	A-300	"
	Faisalabad	2,825 x 46	A-300	2,825 x 46	A-300	"
	Multan	2,743 x 30	B-707	2,743 x 46	A-300	Widening
	Mianwali	3,048 x 46	DHC-6	3,048 x 46	-	Existing
	Bahawalpur	1,524 x 23	F-27	2,286 x 30	B-737	Extension
	R.Y.Khan	2,743 x 30	F-27	2,743 x 30	B-737	Existing
	Bhagtanwala	1,920 x 46	F-27	2,286 x 46	B-737	Extension
	Mangla	1,524 x 30	F-27	1,524 x 30	F-27	Existing
	Walton	-	-	1,829 x 30	F-27	"
	D.G Khan	-	-	2,438 x 30	B-737	New Airport
N.W.F.P	Peshawar	2,743 x 46	A-300	2,743 x 46	A-300	Existing
	Chitral	1,768 x 30	F-27	1,768 x 31	F-27	"
	D.I.Khan	1,524 x 23	F-27	2,286 x 23	B-737	Extension
	Saidu Sharif	1,829 x 46	F-27	1,829 x 46	F-27	Existing
	Bannu	1,829 x 30	F-27	1,829 x 30	F-27	"
	Kohat	2,352 x 46	-	2,352 x 46	-	"
	Prachinar	1,219 x 23	-	1,219 x 23	-	"
	Manschra	-	-	1,829 x 30	F-27	New Airport
Northern Area	Gilgit	1,658 x 30	F-27	2,286 x 30	B-737	Extension
	Skardu	1,981 x 30	B-737	1,981 x 30	B-737	Existing
	Muzaffarabad	914 x 23	F-27	914 x 23	F-27	"
	Rawalakot	914 x 23	DHC-6	914 x 23	F-27	"

Source: JICA Study Team

Appendix Table 9.2.11 Required Runway Length and Width, 2005-06

	Airport	Existing Condition (1997-98)		Required (2005-06)		Remarks
		Runway Length (m)	Maximum Operated Aircraft	Runway Length (m)	Maximum Operated Aircraft	
Balo-chistan	Quetta	3,658 x 46	A-300	3,658 x 46	A-300	Existing
	Gwadar	2,286 x 30	B-737	2,286 x 23	B-737	"
	Jiwani	1,783 x 46	F-27	1,783 x 46	F-27	"
	Khuzdar	1,829 x 30	F-27	1,829 x 31	F-27	"
	Panjgur	1,524 x 23	F-27	1,524 x 23	F-27	"
	Pasni	2,743 x 46	B-737	2,743 x 46	B-737	"
	Sui	1,524 x 46	F-27	1,524 x 46	F-27	"
	Turbat	2,286 x 30	B-737	2,286 x 30	B-737	"
	Zhob	1,829 x 30	F-27	1,829 x 30	F-27	"
	Dalbandin	1,524 x 23	F-27	1,524 x 23	F-27	"
	Ormara	1,524 x 25	F-27	1,524 x 25	F-27	"
	Sibi	1,829 x 23	-	1,829 x 23	-	"
	Kharan	-	-	-	-	New Airport
	Loralai	-	-	-	-	"
Sindh	Karachi	3,200 x 46	B-747	3,200 x 46	B-747	Existing
	"	3,400 x 45	B-747	3,400 x 45	B-747	"
	Hyderabad	2,133 x 30	F-27	2,133 x 30	F-27	"
	Moenjodaro	2,743 x 30	B-737	2,743 x 30	B-737	"
	Nawabshah	2,743 x 46	F-27	2,743 x 46	F-27	"
	Sukkur	2,743 x 46	B-737 (B-747)	2,743 x 46	A-300 (B-747)	"
	Jacobabad	3,048 x 30	F-27	3,048 x 30	F-27	"
	Mirpur Khas	3,048 x 46	F-27	3,048 x 46	F-27	"
	Talhar	2,743 x 23	-	2,743 x 23	-	"
	Sehwan Sharif	-	-	1,829 x 30	F-27	New Airport
	Bhitshah	-	-	-	-	"
	Naushero Feroz	-	-	-	-	"
Punjab	Islamabad	3,350 x 46	B-747	3,800 x 45	B-747	New Airport
	Lahore	3,360 x 46	B-747	3,360 x 46	B-747	Existing
	"	2,743 x 46	A-300	2,743 x 46	A-300	"
	Faisalabad	2,825 x 46	A-300	2,825 x 46	A-300	"
	Multan	2,743 x 46	B-707	2,743 x 46	A-300	"
	Mianwali	3,048 x 46	-	3,048 x 46	-	"
	Bahawalpur	2,286 x 30	B-737	2,286 x 30	B-737	"
	R.Y.Khan	2,743 x 30	B-737	2,743 x 30	B-737	"
	Bhagtanwala	2,286 x 46	B-737	2,286 x 46	B-737	"
	Mangla	1,524 x 30	F-27	1,524 x 30	F-27	"
	Walton	1,829 x 30	F-27	1,829 x 30	F-27	"
	D.G Khan	2,438 x 30	B-737	2,438 x 30	B-737	"
	Sialkot	-	-	2,286 x 30	B-737	New Airport
N.W.F.P	Peshawar	2,743 x 46	A-300	2,743 x 46	A-300	Existing
	Chitral	1,768 x 30	F-27	1,768 x 30	F-27	"
	D.I.Khan	2,286 x 30	B-737	2,286 x 30	B-737	"
	Saidu Sharif	1,829 x 46	F-27	1,829 x 46	F-27	"
	Bannu	1,829 x 30	F-27	1,829 x 30	F-27	"
	Kohat	2,352 x 46	-	2,352 x 46	F-27	"
	Prachinar	1,219 x 23	-	1,219 x 23	-	"
	Mansehra	1,829 x 30	F-27	1,829 x 30	F-27	"
	Wana	-	-	-	-	New Airport
Northern Area	Gilgit	2,286 x 30	B-737	2,286 x 30	B-737	Existing
	Skardu	1,981 x 30	B-737	1,981 x 30	B-737	"
	Muzaffarabad	914 x 23	F-27	914 x 23	F-27	"
	Rawalakot	914 x 23	F-27	914 x 23	F-27	"
	Chillas	-	-	-	-	New Airport

Source: JICA Study Team

Appendix Table 9.2.12 Terminal Facility Requirements, 1997-98

Location	Airport		Apron (No. of Spot) L	W	N	F	Passenger Building (m2)	Car Parking (m2)	Cargo Building (m2)	Remarks
	Quetta	Int'l		2			2,000	2,240		
		Dom		3	2	1	6,300	11,760	130	
	Gwadar	Int'l			2		1,250	1,400		
		Dom			2	2	1,350	2,520		
	Jiwani					2	400	1,120		
Balo-	Khuzdar					2	400	1,120		
chistan	Panjgur					2	600	1,680		
	Pasni				2	1	800	2,240		
	Sui					2	500	1,400		
	Turbat				2	1	1,300	3,640		
	Zhob					2	600	1,680		
	Dalbandin					2	300	840		
	Ormara					2	400	1,120		
	Sibi						0	0		
	Kharan						0	0		New Airport
	Karachi	Int'l	4	8	2		46,000	49,280	23,000	
		Dom	3	6	3	5	24,450	45,640	3,500	
	Hyderabad					2	500	1,400		
Sindh	Moenjodaro				2	1	700	1,960		
	Nawabshah					2	400	1,120		
	Sukkur				2	1	2,200	6,160		
	Jacobabad					2	500	1,400		
	Mirpur Khas					2	200	560		
	Talhar						0	0		
	Sehwan Sharif						0	0		New Airport
	Islamabad	Int'l	3	2			11,250	12,600	2,300	
		Dom	2	4	2	5	15,000	28,000	1,300	
	Lahore	Int'l	2	2			10,000	11,200	1,800	
		Dom	2	4	3	3	16,200	30,240	2,000	
	Faisalabad			2	1	1	2,200	6,160	90	
Punjab	Multan			2	1	1	2,700	7,560	80	
	Mianwali					2	0	0		
	Bahawalpur				2	1	700	1,960		
	R.Y.Khan				2	1	700	1,960		
	Bhagtanwala				2	2	1,400	3,920	190	
	Mangla					2	500	1,400		
	Walton					3	900	2,520		
	D.G Khan				2	2	1,000	2,800	100	New Airport
	Peshawar	Int'l		2	1		4,000	4,480	250	
		Dom		3	1	2	5,100	9,520	260	
	Chitral					2	600	1,680		
N.W.F.P	D.I.Khan				2	1	600	1,680		
	Saidu Sharif					2	500	1,400		
	Bannu					2	400	1,120		
	Kohat						0	0		
	Prachinar						0	0		
	Mansehra					3	700	1,960		New Airport
Northern	Gilgit				2	1	900	2,520		
Area	Skardu				2	1	1,300	3,640		
	Muzaffarabad					2	500	1,400		
	Rawalakot					2	500	1,400		

Source: JICA Study Team

Appendix Table 9.2.13 Terminal Facility Requirements, 2005-06

Location	Airport		Apron (No. of Spot) L	W	N	F	Passenger Building (m2)	Car Parking (m2)	Cargo Building (m2)	Remarks
	Quetta	Int'l		2			2,000	2,240	50	
		Dom		4	2	1	12,000	22,400	170	
	Gwadar	Int'l			2		1,500	1,680		
		Dom			2	2	1,500	2,800		
	Jiwani					2	400	1,120		
Balo-	Khuzdar					2	500	1,400		
chistan	Panjgur					2	800	2,240		
	Pasni				2	1	1,100	3,080		
	Sui					2	600	1,680		
	Turbat				2	1	1,600	4,480		
	Zhob					2	700	1,960		
	Dalbandin					2	400	1,120		
	Ormara					2	500	1,400		
	Sibi						0	0		
	Kharan						0	0		New Airport
	Loralai						0	0		"
	Karachi	Int'l	5	10	1		63,950	76,160	34,500	
		Dom	4	8	3	6	40,200	75,040	6,000	
	Hyderabad					2	600	1,680		
	Moenjodaro				2	1	900	2,520		
Sindh	Nawabshah					2	500	1,400		
	Sukkur			3	1	1	3,700	10,360		
	Jacobabad					2	600	1,680		
	Mirpur Khas					2	300	840		
	Talhar						0	0		
	Sehwan Sharif					2	800	2,240		New Airport
	Bhit Shah						0	0		"
	Naushero Feroz						0	0		"
	Islamabad	Int'l	3	2			15,000	16,800	3,400	
		Dom	2	5	2	6	24,000	44,800	2,200	
	Lahore	Int'l	2	3			12,750	14,280	2,700	
		Dom	3	5	2	4	25,800	48,160	3,300	
	Faisalabad			2	1	1	2,900	8,120	120	
	Multan			2	1	1	3,800	10,640	120	
Punjab	Mianwali						0	0		
	Bahawalpur				2	1	1,000	2,800		
	R.Y.Khan				2	1	900	2,520		
	Bhagtanwala				2	2	1,800	5,040	240	
	Mangla					2	700	1,960		
	Walton					3	1,200	3,360	130	
	D.G Khan				2	2	1,500	4,200	210	New Airport
	Sialkot				2	2	1,900	5,320	260	"
	Peshawar	Int'l		3			5,250	5,880	370	
		Dom		3	1	2	7,350	13,720	420	
	Chitral					2	800	2,240		
N.W.F.P	D.I.Khan				2	1	700	1,960		
	Saidu Sharif					2	700	1,960		
	Bannu					2	500	1,400		
	Kohat					2	600	1,680		
	Prachinar						0	0		
	Mansehra					3	900	2,520		New Airport
	Wana						0	0		"
Northern	Gilgit				2	1	1,100	3,080		
Area	Skardu				2	1	1,500	4,200		
	Muzaffarabad					2	600	1,680		
	Rawalakot					2	600	1,680		
	Chillas						0	0		New Airport

Source: JICA Study Team

Appendix Table 9.2.14 Air Navigation System Plan

Location	Airport	Radio Aids						COM	Lighting Aids					MET	Remarks
		PSR SSR	ILS	C-VOR D-VOR	DME	T-DME	NDB	VHF UHF	ALS	RWL	VASIS PAPI	TWL	A/P	RVR	
Balo-chistan	Quetta		8	X	X		X	X	X	X	X	X	X	8	
	Gwadar		M	M	M		X	X	M	8	8	8	8		
	Jiwani			X	X		X	X			M				
	Khuzdar			X			X	X			M				
	Panjgur			X	X		X	X			M				
	Pasni						X	X	X	X	X	X	X		
	Sui														Private
	Turbat		M	8	8		X	X	X	X	X	X	X		
	Zhob			X	X		X	X			M				
	Dalbandin						X	X			M				
	Ormara						X	X			M				
	Sibi						X	X							
Sindh	Karachi	X	X	X	X	X	X	X	X	X	X	X	X	X	
	Hyderabad						X	X	X	X	X	X	X		
	Moenjodaro						X	X	X	X	X	X	X		
	Nawabshah			X	X		X	X		X	X		X		
	Sukkur		8	8	8		X	X	8	X	X	X	X		
	Jacobabad						X	X			M				
	Mirpur Khas						X	X			M				
	Talhar														
	Schwan Sharif						M	M			M				New Airport
Punjab	Islamabad	X	X	X	X	X	X	X	X	X	X	X	X	X	
	"	M	M	M	M	M	M	M	M	M	M	M	M	M	New Airport
	Lahore	X	X	X	X	X	X	X	X	X	X	X	X	X	
	Faisalabad		X	8		X	X	X	X	X	X	X	X	8	
	Multan		X	X		X	X	X	8	X	X	X	X	8	
	Mianwali						X	X							
	Bahawalpur						X	X			8				
	R.Y.Khan			X	X		X	X	X	X	X	X	X		
	Bhagtanwala		8	8	8		8	8	8	8	8	8	8		
	Mangla						8	8			M				
	Walton						8	8			M				
	Sialkot		M	M	M		M	M	M	M	M	M	M		New Airport
	D.G Khan		8	8	8			8	8	8	8	8	8		"
N.W.F.P	Peshawar		8	X	X		X	X	8	X	X	X	X	X	
	Chitral						8	X			M				
	D.I.Khan						X	X			M		X		
	Saidu Sharif						X	X			M				
	Bannu						X	X			M				
	Kohat						M	X			M				
	Prachinar						X	X							
	Mansehra						8	8			M				New Airport
Northern Area	Gilgit						X	X			8				
	Skardu						X	X			8				
	Muzaffarabad						X	X			M				
	Rawalakot						X	X			M				

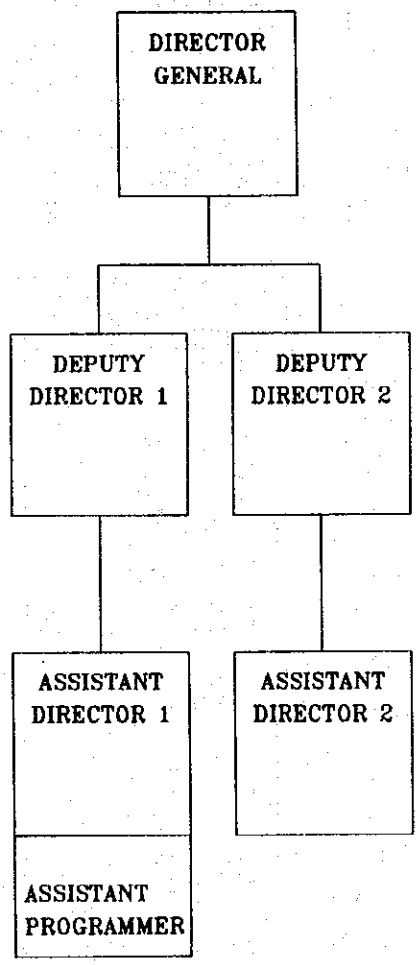
Note : X : Facility Available
8 : Planned in 8th Five Plan
M : Planned in Master Plan

Source: JICA Study Team

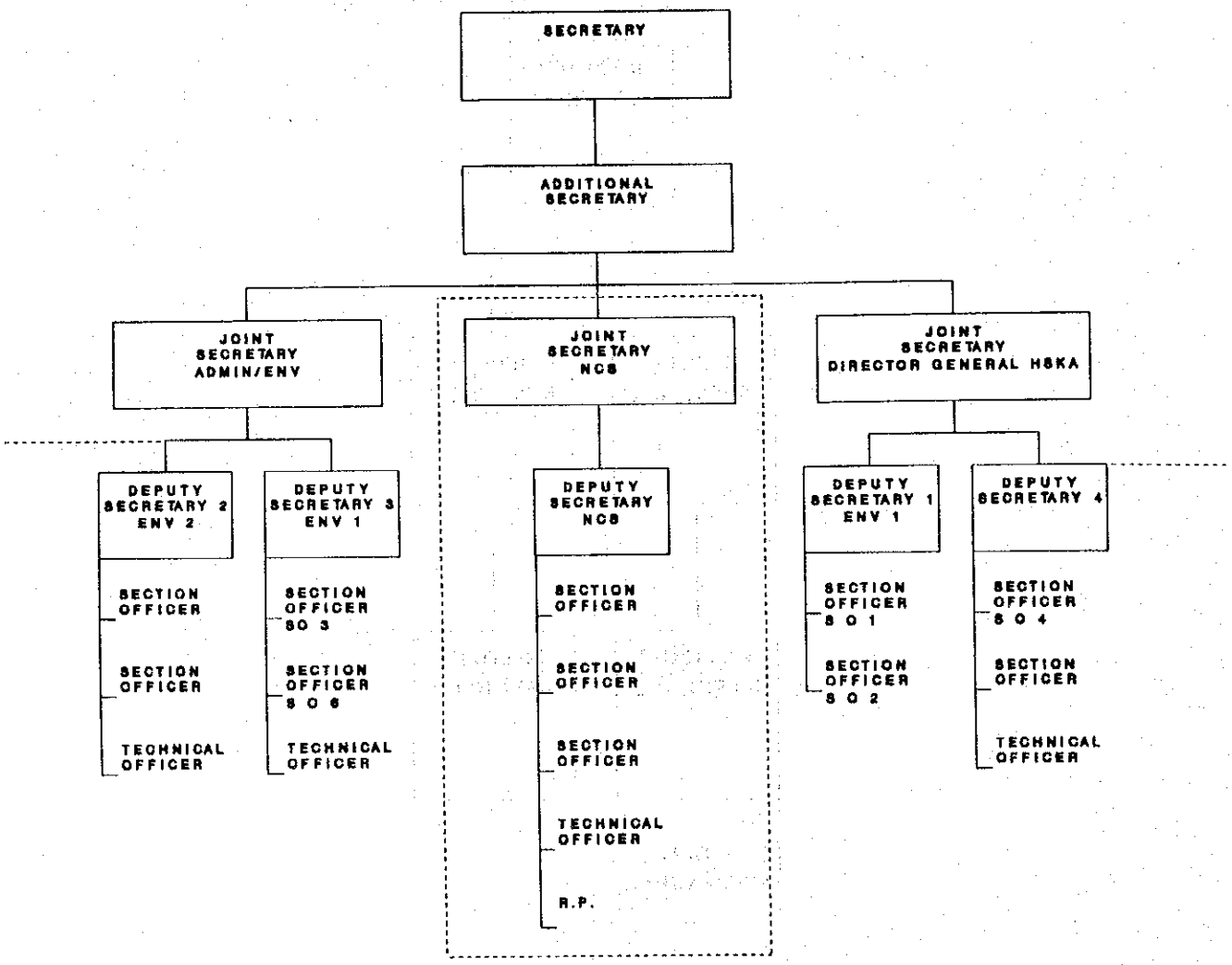
APPENDICES for CHAPTER 12

Appendix 12.1 Organization Charts of Pakistan EPAs

Pakistan (Federal) Environmental Protection Agency

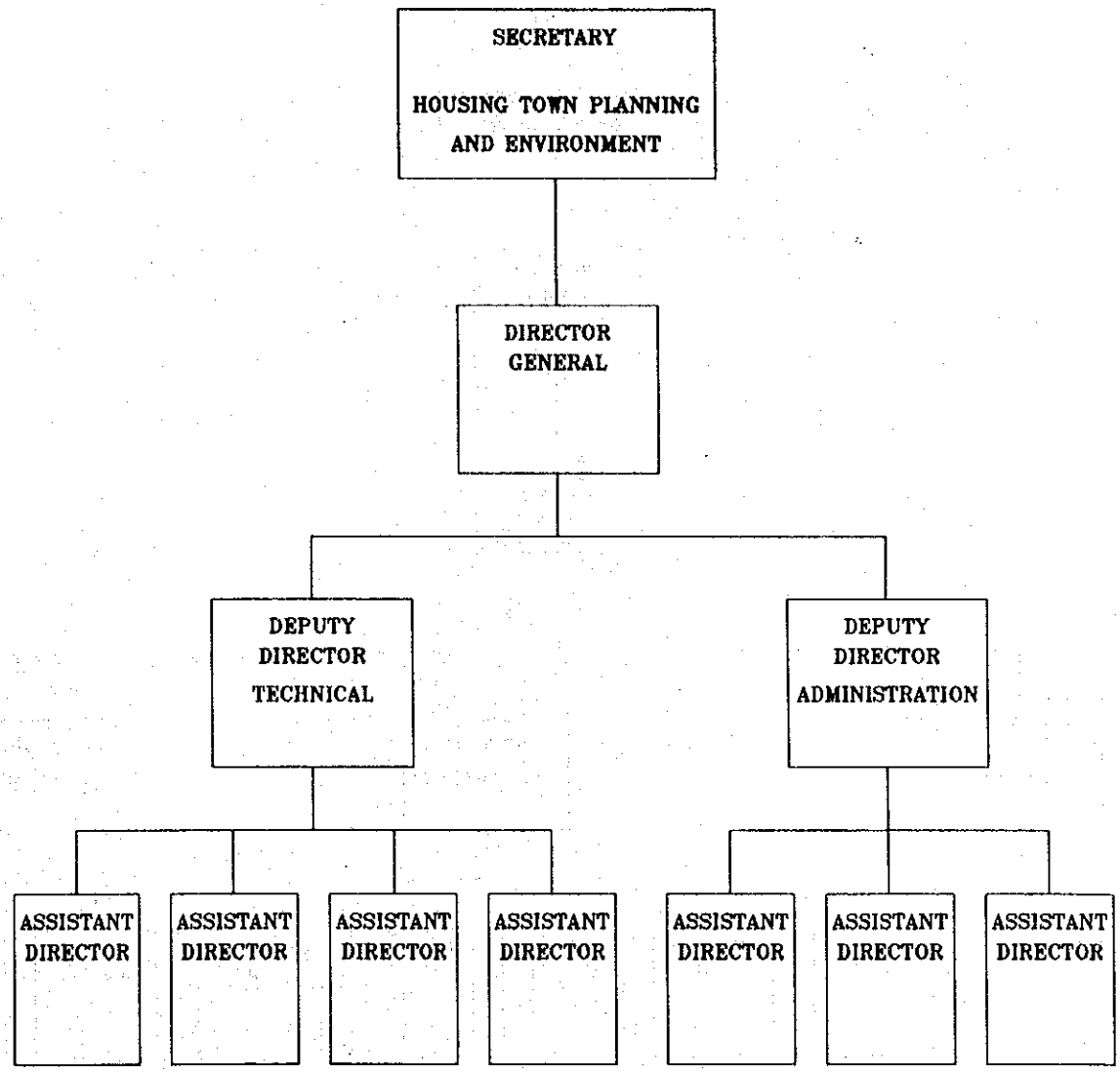


Environment and Urban Affairs Division

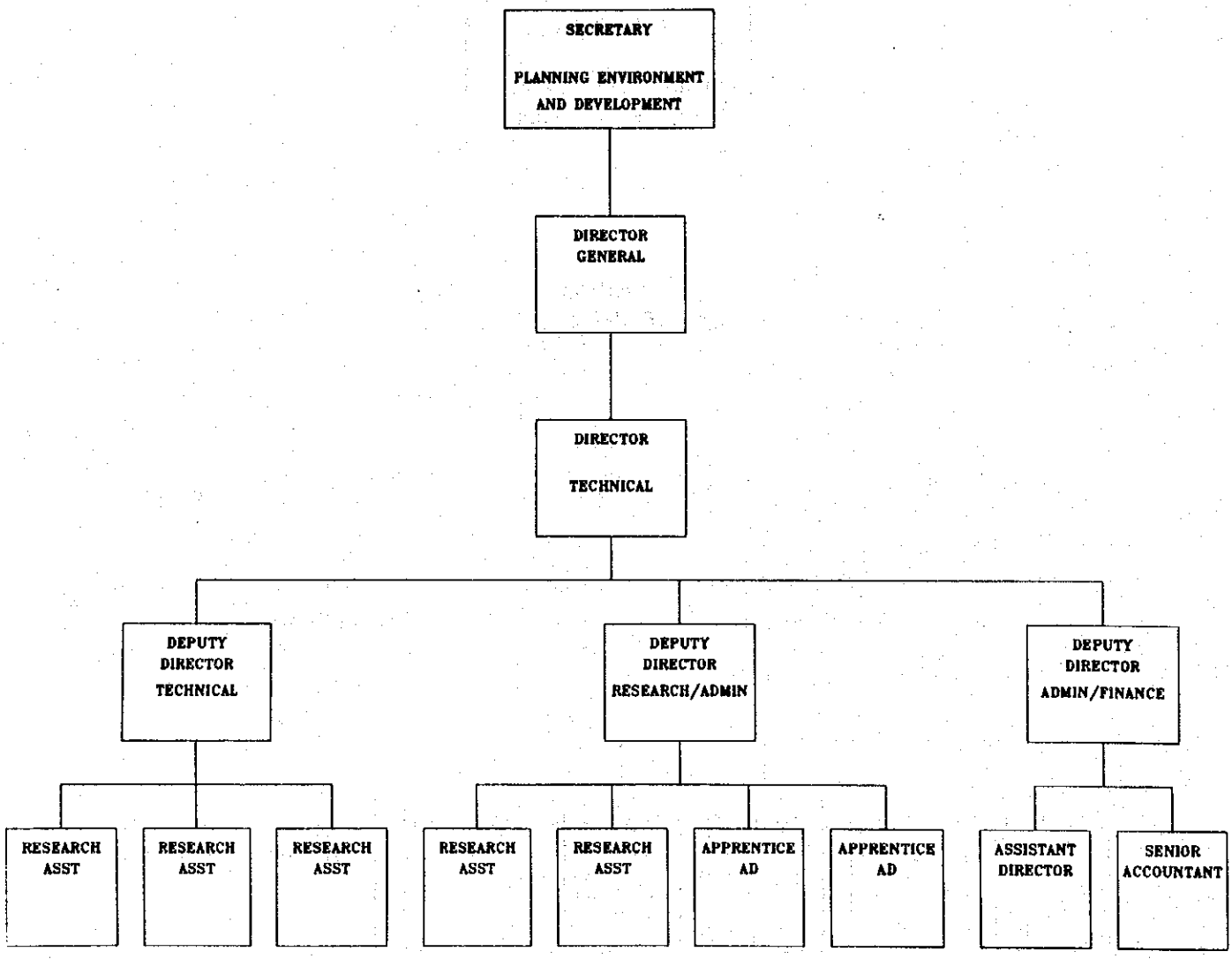


HSKA=HUMAN SETTLEMENTS, KATCHI ABADIS URBAN AFFAIRS

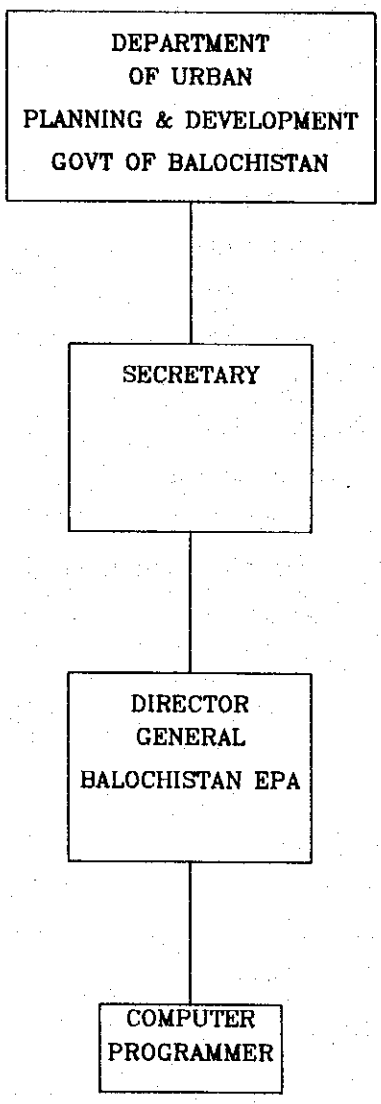
SINDH Environmental Protection Agency



NWFP Environemntal Protection Agency



BALOCHISTAN EPA



Appendix 12.2 List of Organizations Contacted

- Secretary, Environment and Urban Affairs Division, Islamabad
- Director Pakistan EPA, Islamabad
- Director General EPA Punjab, Lahore
- Director General EPA Sindh, Karchi
- Director General EPA NWFP Peshawar
- Director General EPA Balochistan, Quetta
- IUCN/Worldwide Fund For Nature, Islamabad
- IUCN/Worldwide Fund For Nature, Karachi
- TEPA, Lahore Development Authority, Lahore
- Head, Environment Section, Planning and Development Authority, Lahore
- Country Program Officer, World Bank, Islamabad
- Aid Secretary, Canadian Embassy, Islamabad
- Institute of Sustainable Development, Islamabad
- Environment Section, USAID, Islamabad
- Director General, Ports, Ministry f Communication, Karachi
- Project Director, Indus Highway, Islamabad
- Resident Engineer, Indus Highway, Peshawar

Appendix 12.3 Site Visits

Site visits were made to the following locations :

- Peshawar EPA and Kohat Tunnel
- Lowari Tunnel, Chitral and Kalash Valleys
- Punjub EPA and site of Lahore Bypass
- Port Qasim
- Port Karachi

Appendix 12.4 Report on Lowari Tunnel

REPORT ON LOWARI TUNNEL PROJECT BASED ON VISIT BY JICA TEAM MEMBERS, JULY 1994

1 Introduction

Chitral District lies on the extreme north west boundary of Pakistan and borders Afghanistan to the west and north, Gilgit Agency to the east, Swat to the south east, and Dir to the south.

The northern boundary is the Wakhan Corridor in Afghanistan beyond which lies Tajikistan and the Central Asian States.

The Lowari Pass links Chitral District with the rest of North West Frontier Province and is the main access into and out of Chitral District. The Dorah Pass to the west links with Afghanistan, and the Shandur Pass to the east links with Gilgit.

The Lowari Pass carries all the commercial and passenger road traffic into Chitral. PIA flights also operate if the weather permits but flights are frequently canceled. Six months of the year the pass is closed due to snowfall, and apart from air travel, access is not possible.

2 Institutional Arrangements

Various government departments, NGOs and donors are active in Chitral. These include :

(1) The Agha Khan Rural Support Program (AKRSP)

The AKRSP is a private, non-profit organization, established by the Agha Khan Foundation to help improve the quality of life of the villagers in Northern Pakistan.

(2) Asian Development Bank (ADB)

The ADB is currently supporting a Chitral Development Plan.

(3) National Rural Development Program

Within the Eighth Five year plan the Federal Authorities have allocated funds for rural development through the Ministry of Local Government and Rural Development. This includes village electrification, rural water supply, low cost sanitation, farm to market roads, schools and clinics. They are also attempting to implement the Social Action Plan.

(4) National Conservation Strategy

Conservation of natural resources is included in the Pakistan National Conservation Strategy (NCS). This was approved by the Federal Government in 1992 and stresses the need to encourage development whilst minimizing disturbance to the environment.

(5) Sarhad (NWFP) Provincial Conservation Strategy

The Government of NWFP was the first provincial government to undertake a Sarhad Provincial Conservation Strategy (SPCS).

3 Trade and Tourism

Chitral's collection of rugged mountains, sulphur springs, trout streams and orchard-dotted slopes attract tourists from both within and outside Pakistan.

The centre of Chitral Town is heavily congested with vehicles since the main thoroughfare also acts as the market place. Further development will worsen this situation. A pedestrian road is recommended and this might require a ring road/bypass.

4 Water Quality

There are no exploitable underground water sources in the Chitral district. Due to increased human activities and increase in human population sewage loads will increase. Already, Chitral is deficient in sewerage disposal and treatment systems.

It is likely that in addition to polluting the Chitral river water, there may also be contamination of the underground water of the floodplains along the river.

5 Forestry

The slopes around Chitral town are almost completely bare of vegetation. According to historical records, 100 years ago the slopes were heavily wooded. The removal of tree cover is relatively new and due to human activities, not natural causes.

Attempts at reforestation are mainly restricted to the low lying areas where water is more readily available. Attempts at replanting the higher slopes have failed due to lack of irrigation water.

The bare slopes encourage soil erosion as evidenced by the high turbidity of the Chitral river, and this has a significant effect on hydropower schemes. The high silt load causes blocking of the water supply channels and damage to the turbines blades, reducing significantly the life and efficiency of any hydroelectric power generation scheme.

The main reason for deforestation is the need for fuel wood for cooking all year round, and heating in the winter. There is a need for provision of grid electricity, or bottled gas which could relieve the pressure on the forests.

6 Government Services

Medical services are limited in Chitral and if medical & healtyh facilities are not available then illness or accident can result in death. It was reported that this occurs several times each year. At the moment in keeping with the policy of maintaining parity in commodity prices, the government subsidises transport costs over the Lowari Pass. Easier access could permit removal of these subsidies and represent a nett saving to government. The psychological aspects of isolation are apparent, reinforced by the fact that residents do not pay taxes to local government.

7 Cultural Aspects

Chitral itself has a rich cultural heritage, but there is one aspect which makes it unique in Pakistan, and possibly in the world. This is the Kalash culture. The Kalash is a tribe of people who inhabit a series of valleys on the western side of Chitral District and inhabit a part of Afghanistan known as Nuristan. It is claimed that they descended from soldiers of the armies of Alexander the Great. They maintain a pastoral way of life relying heavily on agriculture and animal husbandry. They are not Muslims but practice a form of animism.

Despite the very restricted access to the valleys, which requires a narrow wheelbase vehicle over dirt roads, many tourists visit the Kalash valleys, attracted by the relaxed lifestyle. Attempts are being made to control the numbers and behaviour of tourists by the provision of Kalash guides. Entrance to the valley entails a 50 rupees government tariff. Hydroelectric facilities and telephones are provided to certain parts of the valley but apparently not in its entirety.

The opening of the Lowari tunnel will undoubtedly place a further stress on the Kalash Valleys.

The ability to earn income and particularly foreign exchange is crucial to the development of the Kalash valleys and Chitral District, but unless the development is strictly controlled then the very reason for the tourists visiting will be degraded, as well as a valuable and possibly

uniqueindigenous culture being eradicated.

8 Links with the Central Asian States

Should the tunnel proceed then a northern connection to the Central Asian States is feasible. The concept of a road link to Tajikistan is already advanced with preliminary survey work under way. The preferred route is over the Dorah pass into Afghanistan and then north to Tajikistan. During public consultations, this concept was welcomed as two way trade was envisioned to be to the benefit of the residents.

9 Mineral Exploitation

At present, mineral exploitation in the valleys is limited. Various minerals have been detected but the amount of economically recoverable proven reserves is not known. Precious metals such as gold and copper may be worth exploiting. Limestone deposits may be a potential raw material for cement production.

10 Small Industries

The increased access may facilitate more cottage industry development, which is in line with government recommendations in the current 5-Year plan. In order to secure the best advantage for the Chitralis, industries with high value added should be encouraged rather than the export of raw materials.

11 Conclusions

There are many development agencies and institutional support mechanisms operating in the Chitral region, but some of them are reaching the end of their programs. With a view to sustainability it is important for the residents of Chitral, with government support, to develop their own self reliant economy based on natural resources and a net export of value added goods, or cash surplus, without government subsidies. In the long term the provision of an all year access and the opening up of the Central Asian States could offer enormous development potential for the people of Chitral.

In order to allow the Chitral area to develop in a sustainable way it is considered necessary for them to have an Economic and Environmental Master Plan. Such a study should look at the local economy, industry, transportation and social services, all of which should be developed in a way that serves their economic needs and at the same time preserve their precious and unique culture. If such a plan is not undertaken, a possibly unique culture may be lost.

Appendix 12.5 Report on Port Qasim

VISIT REPORT

LOCATION : Port Qasim, Karachi
DATE : September 12/13, 1994
PERSONS INTERVIEWED:

Dr. Parvez Naeem, IUCN
Engineer Khalid Makhdoom
Deputy General Manager, Planning & Development
Mr. Ahmad Kamal Alavi, Manager Environment & Safety

1. Port Qasim lies 50 km south east of Karachi and was founded in 1976. The port became operational in 1980 and provides multi-modal transport connections to the rest of the country by means of a 14 km linkage to the National Highway, and a rail link to the National Railways.
2. The port has 8 berths, 5,000 hectares of land above high water mark and controls 64,000 hectares of water area. The approach to the port is through the 40 km Ahsan Channel which connects the port to the open sea. The approach is through extensive creeks and wetlands, with a large number of mangroves being present.
3. At present the port handles ship of 25,000 DWT although the channel is suitable for vessels of 50,000 DWT in fair weather. It is intended to dredge the channel to take ships of 75,000 DWT.
4. To the landward side of the port are 2 industrial reserved areas, which are intended to be developed for segregated light and heavy industrial use. Two major occupants of this area are Pakistan Steel Mills and the oil fired power station. Both are major sources of air pollution.
5. The waters of the port area receive pollution from other land based sources. These include Korangi Tanneries, the Cattle Colony with 85,000 head of cattle, Sindh Alkali works and the nearby Korangi Fish Harbour.
6. Within the port itself, oil and fertilizer are reported to be spilled in the water. There is evidence of oxygen depletion and eutrophication. Also the thermal power plants discharge warm water. In total this represents a serious threat to the mangrove population, of which it is estimated (from satellite imagery) that there are 10,500 ha. of dense mangroves, 4,600 ha. of medium mangroves and 3,900 ha. of sparse mangroves. The mangroves are a rich ecosystem as well as providing physical protection to the port area and beaches.
7. The port is currently underutilized and receives 1.2 million tonnes per year of fuel oil from Fujairah for the thermal power stations. The new oil terminal jetty is being constructed from the old berth #1 and this will allow 4 million tonnes to be handled each year, for Jamshoro and Hub power stations.
8. LPG is also transhipped This involves three transfers from vessel to shore to pipeline, and is not conducted in an acceptable manner.
9. The EIA of the port was conducted in 1993 by IUCN with the full cooperation of the port. This resulted in the setting up of an environment department designated Environment and Safety (E and S). They have been in operation since January 1994.. They have made an impressive start and intend to implement the staff structure recommended in the IUCN EIA.
10. At present they have 3 tugs, of which 1 is equipped with foam fire fighting equipment. They intend to convert all 3 to foam.
11. They have purchased additional fire fighting equipment and oil spill control equipment from Aquaguard in Canada. This cost 3.7 million Rupees. The suppliers will be providing training staff. It is intended to recruit 12 technical personnel to receive this training and to be on

standby to deploy it in the event of a spill. The equipment contains permanent booms, moveable booms and portable skimmers.

12. A contingency plan with emergency response procedures has been prepared by the E and S department and sent for Board approval.

13. Strong concerns have been expressed by E and S department over LPG handling procedures. It is considered that these concerns are genuine.

14. Further equipment has been requested in a PC-1. This is for a 25 knot speed boat, Infra Red camera equipment and radar, self propelled skimmers, and analytical laboratory equipment.

15. The E and S department have placed notices in the press requesting pre-qualification of contractors for solid waste/garbage removal and oily/water waste removal.

16. The port area experiences strong tides and a difficulty is identifying the source of spill. One ship was recently identified as a culprit. The current law allows for a fine of Rs.500.

    Following advice from their legal department, the E and S department are now pressing for a criminal case and fine of Rs 50,000.

17. There are no planning controls over the occupants of plots of land on the Industrial Estate. It is intended that these should submit an EIA before being allowed to proceed.

18. CONCLUSION

The E and S department are making serious efforts to improve the environment around Port Qasim but require considerable assistance. The following steps are recommended:

a) Establish EIA procedures for new industries.

b) Establish an air pollution monitoring program.

c) Establish a water quality monitoring program.

d) In order to achieve these, it is recommended that the allocation requested under the PC-1 be extended to include:

- High Speed Patrol Boat.
- Radar and I.R. Cameras.
- Self propelled skimmers.
- Full water quality analysis equipment of laboratory standard, to include conventional parameters, heavy metals, and hydrocarbons.
- Full air pollution analysis equipment of laboratory standard to include NOx, SOx, particulates and ferrous/ferric oxides.
- Field equipment for air pollution monitoring. Five sets to allow monitoring on four points of the compass around Port Qasim, plus a control station.
- Meteorological equipment to give hourly data to correlate with air pollution equipment. This to be installed at E and S in Port Qasim.
- Four Desk Top computer plus air conditioners.
- Fax plus computer modem link to allow access to data sources for use in emergencies e.g. IRPTC (International Registers of Potentially Toxic Chemicals) Paris.
- Provision for 3 years supply of expendable chemicals, and spare parts of all laboratory

equipment, plus a 1 year service warranty.

- Budget allocation for technical publications, books, and codes of practice, from UN, USEPA, MARPOL and IMO.
- Budget provision for short training courses of say 3 months for staff.

In addition the E and S department have requested 4WD vehicles, and a 300 tonne dumb barge for use in recovery of oil spills.

It is recommended that these requests be considered, as these are considered essential to protecting the highly valuable wetlands and mangroves ecosystem in this area.