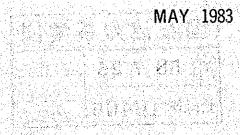
THE STUDY ON NATIONAL TRANSPORT PLAN IN THE ISLANDE REPUBLIC OF PAKISTAN

TECHNICAL PARENCYCL



THE STUDY ON NATIONAL TRANSPORT PLAN IN THE ISLAMIC REPUBLIC OF PAKISTAN

TECHNICAL PAPER Vol. 1



JAPAN INTERNATIONAL COOPERATION AGENCY

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I. REGIONAL ECONOMY

- 1. Methodology and Assumption
- 2. Existing and On-going Projects in Industrial Section
- 3. Statistical Data
- 4. District-wise Projection

I. REGIONAL ECONOMY

1. Methodology and Assumption

1) Agriculture

Province-wise production of wheat, rice, sugarcane and cotton have been firstly projected by multiplying farm land area by yield per nectare like national projection. Farm land area by province is estimated based on provincial share which is shown in Table 1. Also, yield per hectare by province is estimated based on comparative ratio of province and national which is shown in Table 2.

Secondly, the provincial production has been brokendown into district-wise production in a way similar to the projection of district population.

2) Manufacturing

The district-wise production of edible oil, sugar, cement, fertilizer and iron & steel, as well, as all the industries have been projected based on the following process.

a) Total Industry

The data of total industrial production by province and district are not available except in Census of Manufacturing Industry (CMI). Besides, CMI has not been conducted since 1975–76. Thus, the district-wise production of total industry in 1980–81 has been estimated first by using CMI data in 1970–71 and 1975–76. Secondly, the projection of total industrial production is done by using the following cross section model and projected figures are adjusted against the national total.

$$Y = -92 + (2.10768 + 3.30394 DMY) POP$$
 $r = 0.9853$ where

Y: Total industrial production by zone¹⁾

POP: Urban population by zone

DMY: Dummy variable (Karachi = 1, other zone = 0)

1) The whole country has been divided into 18 zones.

b) Edible oil

Province-wise production

The production of edible oil has been projected by province using the following model;

log PP =	4.35691 + 0.53017 log T	r = 0.9745
log PS =	4.05886 + 0.37381 log T	r = 0.9753
log PN =	2.81552 + 0.37827 log T	r = 0.7903
log PB =	-0.39608 + 1.12639 log T	r = 0.9999

where

PP: Production of edible oil in Punjab

PS: Production of edible oil in Sind

PN: Production of edible oil in NWFP

PB: Production of edible oil in Baluchistan

T: Time trend (1971-72=1...1980-81=10)

Subject to National total = PP + PS + PN + PB

Table 1 Share of Provincial Farm Land Area Relating to Major Crops

(%) Punjab Sind N.W.F.P. Baluchistan Pakistan Wheat 72.3 14.0 11,1 2.6 100.0 Rice 52.2 42.0 3.6 2,2 100.0 Sugarcane 100.0 71.2 15.5 13.3 Cotton 73.8 26.1 0.1 100.0

Source: Agricultural Statistics of Pakistan 1980

Statistical Pocket Book of Pakistan 1982

Note: Average during 1971-72 to 1980-81

Table 2 Comparative Ratio of Provincial and National Yield per Hectare Relating to Major Crops

	Punjab	Sind	NWFP	Baluchistan	Pakistan
wheat	1.03	1.,15	0.69	0.66	1.00
Rice	0.91	1.14.	0.87	0.87	1.00
Sugarcane	1.00	0.96	1,02		1.00
Cotton	0.92	1.23	0.65	en T aran, en	1.00

Source: Agricultural Statistics of Pakistan 1980

Statistical Pocket Book of Pakistan 1982

Note: Average during 1971-72 to 1980-81

District-wise production

The production projected at the provincial level has been brokendown into district-wise production based on the location and production capacity of on-going projects obtained from Vegetable Ghee Corporation and each provincial government.

c) Sugar

Province-wise production

The production of sugar has been projected by province using the following model;

PP = -103.9 + 0.019940 SP				r = 0.7956
PS = 164.7 + 0.109609 SS	:			r = 0.9395
PN = -194.6 + 0.083692 SN			. ,	r = 0.6036

where

PP: Production of sugar in Punjab PS: Production of sugar in Sind

PN: Production of sugar in NWFP

SP: Production of sugarcane in PunjabSS: Production of sugarcane in Sind

SN: Production of sugarcane in NWFP

Subject to National total = PP + PS + PN

District-wise production

According to Ministry of Industry, the present average ratio between (A) capacity of sugarmill and (B) production of sugarcane of respective districts by province are;

(B)/(A)

Punjab: 39 t/unit

Sind : 12 t/unit

NWFP: 18 t/unit

Average production capacity of sugarmill by province are;

Punjab: 24,000 t

Sind : 27,000 t

NWFP: 27,000 t

It is assumed, therefore, that the sugarmills will be set up in the districts where projected. Production of sugarcane exceeds the following level;

Punjab : $39 \text{ t} \times 24,000 \text{ t} = 936,000 \text{ t}$

Sind : $12 t \times 27,000 t = 324,000 t$

NWFP: $18 t \times 27,000 t = 486,000 t$

d) Cement

The production of cement in 1987-88 has been projected by district based

on the capacity of existing and on-going projects obtained from Ministry of Production. With regard to production in 1999–2000, it is assumed that share of production among districts in 1987–88 will remain constant.

e) Fertilizers

The production of fertilizers in 1987–88 has been projected by district in a way similar to the projection of cement, but based on the data obtained from Ministry of Industry. Provincial production in 1999–2000 has been projected based on the provincial fertilizers demand which has been projected in the port projection, and provincial production has been brokendown into district-wise production in a way similar to the projection of cement production.

f) Iron & steel

Province-wise production

Firstly, the production of iron & steel for Punjab and Sind excluding Karachi Steel Mill has been projected by using the following model;

 $\log PP = 2.5784 + 1.16749 \log T$ r = 0.9040 $\log PS = 2.5107 + 1.11843 \log T$ r = 0.8552

where

PP: Production of iron & steel in Punjab

PS: Production of iron & steel in Sind

T: Time trend (1971-72=1...1980-81=10)

For NWFP, it is assumed that the level of production in 1980-81 will remain constant.

Secondly, projected figures by province are adjusted the national total excluding Karachi Steel Mill.

Thirdly, the production of Karachi Steel Mill is added to the results of projection above for Sind.

District-wise production

The district-wise data of iron & steel production are not available except in CMI. Thus, the production of iron & steel by district in 1980—81 has been first estimated in a way similar to the production of total industry. Secondly, it is assumed that district share in production of iron & steel in 1980—81 will remain constant.

3) Coal, Crude Oil and Petroleum

It is difficult to project production of mining and energy not only by district but also by province. It is, therefore, that district share in production of coal, crude oil and petroleum products in 1980-81 will remain constant. As for coal production, province-wise production has been done by using the following model;

 $\log PN = 1.78591 + 0.675850 \log T$

r = 0.6528

log PB = 6.72597 - 0.093570 log T

r = 0.5729

where

PP: 3 year moving average in production of coal in Punjab

PS: -do-in Sind

PN: -do- in NWFP

PB: -do- in Baluchistan

T: Time trend (1971-72=1...1980-81=10)

Subject to National total = PP + PS + PN + PB

2. Existing and On-going Projects in Industrial Section

for Vegetable Ghee Industry; See Table 3

for Sugar Mills ; See Table 4

for Cement Industry ; See Table 5

for Fertilizer Industry ; See Table 6

3. Statistical Data

- 1) Province-wise Production
 - a) General note

Agriculture

Source: Agricultural Statistics of Pakistan 1980

Statistical Pocket Book of Pakistan 1982

Manufacturing

Source: Pakistan Economic Survey 1980-81

Monthly Survey of Industrial Production & Employment in the

Punjab February, 1982

Monthly Survey of Industrial Production & Employment in

Sind December, 1981

Government of NWFP

Statistical Pocket Book of Pakistan 1982

Note: The sum of provincial figures is not always equal to Pakistan

total due to the different source.

Energy

Source: Energy Year Book 1979, 1980

b) Data

See Table 7 to Table 18

2) Field-wise and/or Refinery-wise Production

See Table 19 to Table 21

Table 3 Existing and On-going Projects in Vegetable Ghee Industry

Existing 1 Suraj Ghee Industries Limited 24,000 2 United Industries Faisalabad 28,000 3 Kakakhel Industries Faisalabad 29,000 4 Sargroh Vegetable Ghee Mills Faisalabad 21,000 5 Morafco Industries Limited Faisalabad 19,000 6 Sheikh Fazal Rahman & Sons Ltd. Multan 28,000 7 A & B Industries Gases Limited Multan 14,500 Multan 14,500 Multan 14,500 Multan 14,500 Multan 14,500 Multan 16,500 Multan 17,000 Multan 18,000 Multan 16,500 Multan Multan 14,500 Multan Mu	here had then the time the Nich had been had been from that they had the first that they had the had the first that they had the that they had then had they see had they peel had they then they	This first field shall state thing there were desire strong states that their best states	
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23 Bara Vegetable Ghee Mills 24 Dargai Oil Processing Industries Dargai 25 Haripur Oil Processing 26 Chitan Vegetable Ghee Mslls 27 Lever Brothers Pakistan Limited 28 Lever Brothers Pakistan Limited Rahim Yar Khan 29 Army Welfare Food Industries 30 Khyber Vegetable Ghee Mills 31 AKMIDC Vagetable Ghee Mills 31 Total 32 Daman 3 Pakistan Ghee Industry 4 Ra-ni Ghee Mill 32 Daman 3 Pakistan Ghee Industry 4 Ra-ni Ghee Mill 31 Jhelum 31 Dargai 31 Da		- ·	
Dargai Oil Processing Industries Dargai 11,000 That Industries Limited Chitan Vegetable Ghee Mslls Quetta 9,000 The Rever Brothers Pakistan Limited Rahim Yar Khan 19,000 Rever Brothers Pakistan Limited Karachi 15,000 Army Welfare Food Industries Faisalabad 12,000 Khyber Vegetable Ghee Mills Lahore 8,000 AKMIDC Vagetable Ghee Mills 9,000 Total 528,500 On-going Blue Star Bahawalpur 9,000 Daman D.I.Khan 9,000 Ra-ni Ghee Mill Jhelum 9,000	23 Bara Vegetable Ghee Mills		
25 Haripur Oil Processing Industries Limited 26 Chitan Vegetable Ghee Mslls Quetta 9,000 27 Lever Brothers Pakistan Limited Rahim Yar Khan 19,000 28 Lever Brothers Pakistan Limited Karachi 15,000 29 Army Welfare Food Industries Faisalabad 12,000 30 Khyber Vegetable Ghee Mills Lahore 8,000 31 AKMIDC Vagetable Ghee Mills 9,000 Total 528,500 On-going Blue Star Bahawalpur 9,000 20 Daman D.I.Khan 9,000 3 Pakistan Ghee Industry Gdjrat 9,000 4 Ra-ni Ghee Mill Jhelum 9,000	24 Dargai Oil Processing Industries	Dargai	
26 Chitan Vegetable Ghee Mslls Quetta 9,000 27 Lever Brothers Pakistan Limited Rahim Yar Khan 19,000 28 Lever Brothers Pakistan Limited Karachi 15,000 29 Army Welfare Food Industries Faisalabad 12,000 30 Khyber Vegetable Ghee Mills Lahore 8,000 31 AKMIDC Vagetable Ghee Mills 9,000 Total 528,500 On-going Bahawalpur 9,000 2 Daman Bahawalpur 9,000 3 Pakistan Ghee Industry Gdjrat 9,000 4 Ra-ni Ghee Mill Jhelum 9,000	25 Haripur Oil Processing		
27 Lever Brothers Pakistan Limited Rahim Yar Khan 19,000 28 Lever Brothers Pakistan Limited Karachi 15,000 29 Army Welfare Food Industries Faisalabad 12,000 30 Khyber Vegetable Ghee Mills Lahore 8,000 31 AKMIDC Vagetable Ghee Mills 9,000 Total 528,500 On-going Blue Star Bahawalpur 9,000 2 Daman D.I.Khan 9,000 3 Pakistan Ghee Industry Gdjrat 9,000 4 Ra-ni Ghee Mill Jhelum 9,000		Ouetta	9.000
28 Lever Brothers Pakistan Limited Karachi 15,000 29 Army Welfare Food Industries Faisalabad 12,000 30 Khyber Vegetable Ghee Mills Lahore 8,000 31 AKMIDC Vagetable Ghee Mills 9,000 Total 528,500 On-going Blue Star Bahawalpur 9,000 2 Daman D.I.Khan 9,000 3 Pakistan Ghee Industry Gdjrat 9,000 4 Ra-ni Ghee Mill Jhelum 9,000	27 Lever Brothers Pakistan Limited		
29 Army Welfare Food Industries Faisalabad 12,000 30 Khyber Vegetable Ghee Mills Lahore 8,000 31 AKMIDC Vagetable Ghee Mills 9,000 Total 528,500 On-going Bahawalpur 9,000 2 Daman D.I.Khan 9,000 3 Pakistan Ghee Industry Gdjrat 9,000 4 Ra-ni Ghee Mill Jhelum 9,000			
30 Khyber Vegetable Ghee Mills Lahore 8,000 31 AKMIDC Vagetable Ghee Mills 9,000 Total 528,500 On-going 1 Blue Star Bahawalpur 9,000 2 Daman D.I.Khan 9,000 3 Pakistan Ghee Industry Gdjrat 9,000 4 Ra-ni Ghee Mill Jhelum 9,000	29 Army Welfare Food Industries	and the second s	
31 AKMIDC Vagetable Ghee Mills 9,000 Total 528,500 On-going Bahawalpur 9,000 1 Blue Star Bahawalpur 9,000 2 Daman D.I.Khan 9,000 3 Pakistan Ghee Industry Gdjrat 9,000 4 Ra-ni Ghee Mill Jhelum 9,000	30 Khyber Vegetable Ghee Mills		
Total 528,500 On-going 1 Blue Star Bahawalpur 9,000 2 Daman D.I.Khan 9,000 3 Pakistan Ghee Industry Gdjrat 9,000 4 Ra-ni Ghee Mill Jhelum 9,000	31 AKMIDC Vagetable Ghee Mills		
1 Blue Star 9,000 2 Daman D.I.Khan 9,000 3 Pakistan Ghee Industry Gdjrat 9,000 4 Ra-ni Ghee Mill Jhelum 9,000			
1 Blue Star 9,000 2 Daman D.I.Khan 9,000 3 Pakistan Ghee Industry Gdjrat 9,000 4 Ra-ni Ghee Mill Jhelum 9,000	On-going		
2 Daman D.I.Khan 9,000 3 Pakistan Ghee Industry Gdjrat 9,000 4 Ra-ni Ghee Mill Jhelum 9,000	그 글 기를 글 다른 집에 다른 사람들이 되었다.	Pahara I man	0.000
3 Pakistan Ghee Industry Gdjrat 9,000 4 Ra-ni Ghee Mill Jhelum 9,000			
4 Ra-ni Ghee Mill Jhelum 9,000			
	4 Ra-ni Chee Mill		
	5 Punjab Oil Mill	Islamabad	
	6 Alman Corporation		
6 Ajman Corporation Hab. Chowki. 4,500 7 Qureshi Mill Mirpur 9,000			
8 Fasal Sad Tando Adam, Sind 9,000			
9 Ahuad Vegetable Ghee Sukkur 9,000			
10 Arif Oil Mills Khairpur, NWFP 9,000	10 Arif Oil Mills		
	11 Allied Ghee Industry		
12 Baluchistan Oil Mslls Uchal 4,500	M A		
7/JV0			-7700

Source: Ministry of Industry Vegetable Ghee Corporation

Table 4 Existing Sugar Mills

Name of Mill	Location	Capacity (M.Tonnes)
Punjab	Steph Pulp Albeit Allen Man Heavy Graph Steph Man Both Mark Corp	
1 Fecto Sugar Mills	Darrya Khan	20,728
2 Bahawalnagar Sugar Mills	Chistian	23,167
3 Crescent Sugar ills	Faisalabad	30,483
4 Husein Sugar Mills	Jaranwala	23,167
5 Hyesons Sugar Mills	Jetha Bhutta	23,370
6 Kohinoor Sugar Mills	Jauharabad	20,322
7 Leiah Sugar Mills	Leiah	17,274
	Sangla Hill	23,167
8 Modern Sugar Mills	Bhalwal	23,167
9 Noon Sugar Mills	Rahwali	6,351
10 Rahwali Sugar Mills	Mandi Bahuddin	
11 Shahtaj Sugar Mills	Shakargunj	23,167
12 Shakargunj Sugar Mills	Sadigabad	38,889
13 United Sugar Mills	Sialkot	20,400
14 Pasrur Sugar Mills	Kasur	40,800
15 Pattoki Sugar Mills	Faisalabad	27,200
16 Kamalia Sugar Mills		27,200
17 Samundri Gojra Sugar Mills	Faisalabad	27,200
18 Baba Farid Sugar Mills	Sahiwal	21,200
Sind		00.76
19 Al-Noor Sugar Mills	Moro	23,167
20 Bawany Sugar Mills	Talhar	23,167
21 Fauji/TM Khan	TM Khan	31,839
22 Fauji/Khoski	Khoski	46,334
23 Habib Sugar Mills	Nawabshah	23,878
24 Mirpurkhas Sugar Mills	Mirpurkhas	23,167
25 Mehran Sugar Mills	Tando Allahyar	23,167
26 Larkana Sugar Mills	Naudero	20,728
27 Consolidated	Ranipur	27,000
28 Dadu Sugar Mills	Bayaro Goth	28,800
29 Thatta Sugar Mills	Deh Bijora	28,800
30 Shahmurad Sugar Mills	Thatta	28,400
NWFP		
31 Bannu Sugar Mills	Saria Naurang	
32 Charsadda Sugar Mills	Charsadda	26,419
33 Faontier Sugar Mills	Takht Bhai	14,225
34 Premier Sugar Mills	Mardan	45,725
35 Khazana Sugar Mills	Khazana	31,000
Total		903,862

Source: Ministry of Industry

Table 5 Existing and On-going Projects in Cement Industry

One that the case are the pain one was are and one was must are that the first first that the total one saw one the total time.	the first man tree case and first only area wine that they are man area and and their	
Name of Plant / Project	Location	Capacity
		(M.tonnes)
was and the total time the time the time and the time time time the time time time time time time time tim		(11, 00111100)
Existing		
1 Zeal Pak Factory	Hyderabad	1,080,000
2 Associated Cement Factory	Wah, Attock	450,000
3 Associated Cement Factory	Rohri, Sukkur	270,000
4 Gharibwal Cement Factory	Gharibwal, Jhelu	
5 Mustehkam Cement Factory	Hattar, Hazara	1st 360,000
		2nd 300,000
6 Javedan Cement Factory	Karachi	1st 300,000
		2nd 300,000
7 Maple Lkave Cement Factory	Daud khel	300,000
8 National Cement Factory	Karachi	160,000
9 National Cement Factory	Dankot, Jhelum	50,000
10 White Cement Factory	Daud Khel	15,000
Total		3,285,000
On-going		
Public		
-1	Thatta	330,000
2	Dankot	300,000
3	Kohat	300,000
4	D.G.Khan	600,000
Private		
l Galadari	Lasbela	600,000
2 Fakir	Karachi	300,000
3 Dadabhai	Dadu	300,000
4 Pakland	Thatta	300,000
5 Pharaon	Lasbela	600,000
6 Sarela	Quetta	6,000
7 Farooq	Peshawar	300,000
8 Qureshi	Peshawar	900,000
9 Fecto	Islamabad	300,000

Source: Ministry of Production

Table 6 Existing and On-going Projects in Fertilizer Industry

Name of Unit / Project	Location	Capacity (M.Tonnes)
Existing	ann ann ann aon, ann ann ann ann ann ann ann ann ann a	
1 Exxon Chemical Pakistan Limited	Dharki	173,000
2 Dawood Hercules Chemical Limited	Sheikhupura	345,000
3 National Fertilizer Factory	Daudkhel	97,500
4 Pak-Arab (NFC)	Mulutan	826,900
5 National Fertilizer Factory	Faisalabad	90,000
6 Pak-Saudi (NFC)	Mirpur	543,000
Total Nitrogenous		1,833,250
Phosphatic		242,150
Nitrogenous and Phosphat	ic	2,075,400
On-going		
1 Fauji Fertilizer Company	Sadicaba	543,000
2 Hazara Fertilizer Limited (NFC)	Hazara	96,000

Source: Ministry of Industry

Table 7 Production of Wheat

and the second of the second of				(1000 To	nnes)
Year	Punjab	Sind	N.W.F.P.	Baluchistan	Pakistan
1971-72 72-73 73-74 74-75 75-76 76-77 77-78 78-79 79-80 80-81	5291.1 5693.5 5664.8 5785.6 6571.6 6807.7 6090.2 7323.6 7913.5 8299.9	1081.1 1095.8 1246.0 1143.6 1320.9 1478.6 1427.0 1680.1 1849.4 1949.4	439.6 584.4 606.9 613.2 660.4 711.6 688.6 737.5 810.8 814.6	78.6 68.6 112.2 131.1 137.8 146.0 161.4 208.8 231.1	6890.4 7442.3 7628.9 7673.5 8690.7 9143.9 8367.2 9950.0 10804.8 11302.8
000T	0233.3	T)49.4	014.0		

Table 8 Production of Rice

(1000 Tonnes)

Year	Punjab	Sind	N.W.F.P	Baluchistan	Pakistar
		e tyddiol ai	$-1 \cdot 1 \cdot 1 \cdot 2 \cdot 2 \cdot 1 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot $		
1971-72	991.9	1168.1	59.3	42.6	2261.9
72-73	1000.9	1221.9	66.0	40.9	2329.7
73-74	1114.5	1235.0	72.2	33.4	2455.]
74-75	1152.4	1049-0	76.9	35.5	2313.8
75-76	1207.2	1286.1	84.6	39.6	2617
76-77	1332.0	1292.0	85.4	28.0	2737.4
77-78	1507.8	1315.3	87.6	38.9	2949.6
78-79	1765.9	1340.9	104.0	61.2	3272.0
79-80	1518.4	1499.1	104.7	93.6	3215.8
80-81	1361.7	1549.9	105.1	102.8	3119.5

Table 9 Production of Cotton

				(1000	Tonnes)
Year	Punjab	Sind N.	W.F.P Bal	uchistan	Pakistan
					man dans form Greek Selek have 1964 Orde Smile
1971-72	529.1	177.8	0.4	0.1	707.4
72-73	502.4	198.7	0.5	<u> </u>	701.6
73-74	448.9	208.9	0.6	0.1	658.5
74-75	440.1	193.3	0.6	0.1	634.1
75-76	344.4	168.8	0.5	1 - 1 - 1 <u>- 2</u> - 4 -	513.7
76-77	276.8	157.4	0.6	0.1	434.9
77- 78	359.5	214.8	0.5	-	574.8
78-79	330.3	142.5	0.4		473.2
79-80	481.6	246.1	0.4		728.1
80-81	474.3	239.2	0.5	0.3	714.4

Table 10 Production of Sugarcane

(1000	Tonnes)
-------	---------

Year	Punjab	Sind	N.W.F.P	Baluchistan	Pakistan
aray man 1944 blog 1975 mm mm 1974	والمساور والمراور المراور والمراور والم			<u>,</u>	
1971-72	13774.6	2784.8	3401.8	1.9	19963.1
72-73	13726.9	2915.1	3304.0	1.5	19947.5
73-74	16617.5	3795.0	3497.2	0.8	23910.5
74-75	14810.0	2767.2	3663.1	1.6	21241.9
75-76	18267.6	3586.4	3690.6	2.1	25546.
76-77	21788.3	4037.0	3695.4	2.3	29523.0
77-78	22095.7	4260.4	3718.8	1.7	30076.6
78-79	19343.9	4373.8	3606.1	1.7	27325.5
79-80	19413.5	4664.4	3417.0	2.8	27497.
80-81	23733.0	5007.3	3598.0	21.1	32359.4

Table 11 Production of Edible Oil

				(1000	Tonnes)
Year	Punjab	Sind	N.W.F.P Bal	uchistan	Pakistan
1971-72	90	62	N.A	N.A	162
72-73	105	72	24	N.A	182
73-74	129	90	24	N.A	225
74-75	160	94	30 ; • :	N.A	272
75-76	160	96	30	N.A	277
76-77	193	108	30	N.A	326
77-78	212	113	30	N.A	360
78-79	252	131	32	7	422
79-80	268	140	36	16 g 1 2 8	452
80-81	291	148	57 :-	9	505
	•			•	

Table 12 Production of Sugar

uchistan	Pakistan
a'an an io na eo m'	nam badi ann basi kua gapi mag kani can

(1000 Tonnes)

Year	Punjab	Sind	N.W.F.P	Baluchistan	Pakistan
<u> </u>	s finds your play going were fines band think the	,,, in pu in in in in in		سه مده دنند ودو ودوانيس مند مند مند وند ويد من	a' am ma' ann ma ina ana ma' ann am
1971-72	149	111	97	4 1 -	375
72-73	180	160	97		429
73-74	263	245	94		608
74-75	225	140	130	· - · · · · · · · · · · · · · · · · · ·	502
75-76	319	212	130	-	630
76-77	348	333	93		736
77-78	351	352	116		861
78-79	200	301	107		607
79-80	177	348	61		586
80-81	409	337	106	and the state of t	851
0 A 0 T	409		100.		0.5

Table 13 Production of Cement

Year	Punjab	Sind	N.W.F.P	Baluchistan	Pakistan
			د سناسخ پندسه پسرستانپار ساز بازوانشا بازوانپیو		
1971-72	874	1140	N.A	· -	2605
72-73	973	1599	135	· · · <u>-</u>	2876
73-74	1074	1662	141	i	3145
74-75	1257	1653	192	·	3320
75-76	1197	1618	269		3196
76-77	1235	1427	300	·	3071
77-78	1292	1548	252	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	3224
78-79	1175	1481	367	1 - 1 - 1 - 1 - 1	3023
79-80	1284	1688	370	5 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	3343
80-81	1333	1872	333	*	3538

Table 14 Production of Fertilizers

(1000 M/Tonnes)

495

Year	Punjab	Sind	N.W.F.P	Balu	chistan	Pakistan
		the same state state that the same state state that				pay mak may mad mad will dire the sea
1971-72	401	164		141.	<u>.</u>	601
72-73	511	175	-	4		746
73-74	557	197	_			787
74-75	587	206		1.		829
75-76	620	209	- .	.*	· : : : -	879
76-77	617	206				870
77-78	613	210		2.1	4.1. ₁ =	865
78-79	704	231		* .	}- '÷ ' −	938
79-80	940	214		Style 1	-	1177
80-81	1046	559			-	1605
33 32						

Table 15 Production of Iron & Steel

N.W.F.P Baluchistan Pakistan Sind Punjab Year N.A $N \cdot A$ N.A1971-72 N.A N.A 18 72-73 218 18 N.A N.A 73-74 224 20 N.A 74-75 N.A 20 70 141 75-76 20 78 76-77 172 315 20 143 77-78 152 362 20 138 78-79 204 421 20 151 79-80 250

Note: The data for Punjab are estimated by using the following formula.

Punjab = Pakistan - Sind - NWFP

133

342

80-81

Table 16 Production of Coal

One was they have speed little first went about	here have strate total facility and	(1000 То					
Year	Punjab	Sind	N.	W.F.P	Ва	ıluchistan	Pakistan
1971-72 72-73 73-74 74-75 75-76 76-77 77-78 78-79 79-80	366 314 339 354 331 421 382 408 483	108 92 93 160 89 118 166 245 189		16 22 14 12 14 14 30 42 42		724 764 766 769 621 647 673 692	1214 1192 1212 1295 1055 1200 1251 1387
				4.2		856	1569

Table 17 Production of Crude Oil

Year	Punjab	Sind		N.W.F.P	Baluchistan	Pakistar
1971-72	3008	•		. · · ·	*	2000
72-73	3062	.			1 A B	3008
73-74	2855	-			· <u> </u>	3062
74-75	2443	- Mean	Marine,	_	Mark (Total)	2855
75-76	2512	-	eli Mari		· · · · · · · · · · · · · · · · · · ·	2443
76-77	3743	_		_ # -		2512
77-78	3539	-				3743
78-79	3711		· 1			3539
79-80	3566	-	. # "			3711
	0,500			· · · · · · · · · · · · · · · · · · ·		3566

Table 18 Production of Petroleum Products

State of the same

(1000 Tonnes)

Year	Punjab	Sind	N.W.F.P Baluchistan Paki	stan
			THE COLD COLD COLD COLD COLD COLD COLD COLD	
1971-72	417	2829		3246
72-73	406	2857	• " •	3263
73-74	342	2885		3227
74-75	296	2782		3078
75-76	306	2657	<u></u>	2963
76-77	461	2603		3064
77-78	447	3404	and the second of the second o	3851
78-79	465	3317		3782
79-80	442	3824	VVVA	4266

Table 19 Field Wise Production of Coal (1979–80)

Field	Production (M.Tonnes)
Punjab	
Makerwal/Salt Range Sind	483,351
Lakhra	153,909
Jhimpir	34,656
NWFP	347030
Chirat	41,434
Baluchistan	
Sor-Range	243,257
Degari	103,964
Sharigh	28,478
Sinjidi	127,203
Mach	54,247
Harani Field Nakus Khost	9,847
Dunki	132,992
Pir Ismail Ziarat	145,263
Abegum	10,388
Total	1,568,989

Source: Pakistan Energy Yearbook

Table 20 Field Wise Production of Crude Oil (1979–80)

Field	 John sown such data when lead head of	n mag mad wide drift for	roduction S Barrels)	:
Khaur Dhulian Balkassar Joya Mair Meyal Toot Adhi Total			6,792 123,380 279,841 180,500 2,403,731 514,645 57,453 3,566,342	

Source: Pakistan Energy Yearbook

Table 21 Production of Petroleum Products (1979-80)

	processing the state of the second
Refineries	Production (M.Tonnes)
Attock Refinery Pakistan Refinery National Refinery Total	456,055 1,962,468 2,023,747 4,442,270

Source: Pakistan Energy Yearbook

4. District-wise Projection

for Population	; See Table 22
for Urban Population	; See Table 23
for Rural Population	; See Table 24
for Ratio of Urban Population	; See Table 25
for Wheat Production	; See Table 26
for Rice Production	; See Table 27
for Cotton Production	; See Table 28
for Sugarcane Production	; See Table 29
for Total Industrial Production	; See Table 30
for Edible Oil Production	; See Table 31
for Sugar Production	; See Table 32
for Cement Production	; See Table 33
for Fertilizers Production	; See Table 34
for Iron & Steel Production	: See Table 35
for Coal Production	; See Table 36
for Crude Oil Production	; See Table 37
for Petroleum Products Production	; See Table 38

Table 22 District-Wise Projection of Population

							000)	PERSONS)	S	
	1980	1982	1987 -1988	1999		1980	1982	1987	1999	
PAKISTAN	83782	89327	102635	135756		•				
PUNJAB	15727	50367	57361	74813	Q H BN	13060	13619	15075	19079	
ATTOCK	1140	1178	1285	17.22	2000					
RAWALPINDI	2458	2642	3054	4066	OU POR CONTRACTOR	2445	1468	1591	1997	
JHELUM	1162	1190	1275	1615				0 / t	907	
GUJRAT	2247	2343	2595	3336	DACTOR SCHOOL	0 0 0 %	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7,7	977	
SARGODHA	2557	2692	3024	3919	NO SOCIAL SECTION OF THE PROPERTY OF THE PROPE	0 0) i		518	
MIANWALI	1376	1457	1653	2133	KAURA BIRK	0 0	1 U	א מ א א א	1221	
FAISALABAD	4656	7627	5175	6624	ABBOTTABAD	0.04		0 0	0 t	
JHANG	1962	2078	2361	3071	MANSHRA	0000	1000	0 4 5	7077	
LAHORE	3512	3904	4727	2979	KOHISTAN	665		0077	0 40	
KASUR	1530	1628	1864	2427	D.I.KHAN	719	750	v tr	0 0	
SHEIKHUPURA	2101	2223	2521	3263	S. WAZIRISTAN	308	301	700	100	
600KAN8ALA	2659	2859	3322	4399	BANNU	777	80.5	000	- C } (e } (e	
	2706	2805	3068	3919	N.WAZIRISTAN	235	230	226	272	
NEW STANSON	1581	1697	1974	2569	DIR	769	820	776	1207	
エンチウンズ しくりつご	2151	2304	2675	3480	CHITRAL	208	21.7	242	302	
24 1 3 6 V	4 to 0 to	6787	5018	6580	SWAT	1227	1302	1485	1896	
	50.5	200	4478	5839	MALAKAND	258	273	310	394	
	7447	155	1808	2365						
くこう こくと とこうないこく とうてき しょうしょうしょう とうしょう ひんしゅう	1571	1452	1652	2140						
2017 - 100 VODE	1004	2465	2242	2916						٠.
4	1520	1397	1589	2055						
SIND	18966	20554	24198	32747	BALUCHISTAN	5027	7847	. 000		
		,				,	3.	0.00	0 1 1	
JACOBABAD	1013	1094	1289	1743	QUETTA	380	127	- 6	10	-
SHIKARPUR	619	637	169	o	PISHIN	722	707	ט ע ע ע ע	704	
SUKKUK	1120.	1204	7	∞	LORALAI	391	677	, K	0 0	
LAKKANA	1140	1200	2	ထ	ZHOB	360	807) (C	0 0	
228700123 228400123	1637	1708	8	m	CHAGHAI	120	136	175	200	
た ロケー 次 ア ロ ス コ ス コ ス コ ス コ ス コ ス ス ス ス ス ス ス ス ス ス ス ス ス ス ス ス ス ス ス ス	E 86	1055	N	S	KALAT	333	581	967	763	
HYDEKABAD	2080	2224	S	•	KHARAN	129	143	180	272	
0.500 1.500	1074	1143	M	^	LASBELA	187	202	243	364	
	1501	1632	1941	2632	NASEERABAD	393	435	54.1	820	1.0
K	7 7 1	η 1 α 1 α	~ :	20	SIBI	129	133	155	229	
£ 2 2 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	756	771	826	\circ	KACHI	308	327	3.84	570	
7 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	7 1 0 1	816	<u>ه</u>	n 1	KOHLU	178	193	234	350	
LUNKACAL	5454	6085	7615		KHUZDAR	371	417	533	814	•
					PANJGUR	161	188	252	391	
					TURBAT	378	435	571	880	
					GWADAR	113	119	138	504	

							. !			
			٠.				0000	PERSONS	S>	
	1980	1982 -1983	1987	1999		1980 -1981	1982 -1983	1987 -1988	1999	
AKISTAN	23860	27017	33537	46500						
PUNJAB	13333	15110	18764	26021	OF AN	1652	1855	2264	3038	
ATTOCK		160	177	235	MARDAN	\sim	240	265	342	
RAWALPINDI	1361	1.550	1938	2695		836	952	1190	1610	
JHELUM	212	17	276	376	KHYBER AGENCY	0	0	0	Ο.	
GUJRAT	424	667	633	885	BAJUR & MAHMAND	0	Ó.	Ο.		
SARGODHA	651	733	901	1244	KOHAT	136	15	186	575	
MIANWALI	236	2,4	261	341		0	0 !	0 0		
FAISALABAD	1420	1588	1930	2656	ABBOTTABAD	다 () ()	177	230	0 \ 1 D	
CHANG	442	S	6.51	0 I 0 I 1 I	SANDINA	29	4 V) C	δ	0 0	
LAHORE	2958	λ) 1	//15	96/5	MOLINAR MARKAN	, ,	, ,	4 C	η α 7	
XASUR	1 10	5/5	4 t	† c	MOTOTOLO NOT	0 C) C	1		
0 T T T T T T T T T T T T T T T T T T T	, v	4 ¢	4575	0 0	-	62	. 67	77	100	
て	0 V V	4 6	0.00	942	NATERISTAN	10	0	0	٠.	
D G KAAN	185	208	2 2 2	343	DIR	0	0	.0	0	
MUZAFFARGARH	218	5	327	460	CHITRAL	0	0			
MULTAN	1098	1277	1649	2318	SWAT	88	8) 6	118	158	
SAHIWAL	585	677	859	1201	MALAKAND	٥.	0	o _i	0	
BAHAWALPUR	328	366	777	611						
BAHAWALNAGAR	27	275	336	7 6 3 5 6 3						
RAHIM YAR KHAN	299	347	747	629			1			
VIHARI	180	202	25	7. 0.						
SIND	8205	9285	11523	15918	BALUCHISTAN	670	766	986	1523	
JACOBABAD	159	181	226	314	QUETTA	285	325	977	279	
SHIKARPUR	4.E	128	156	214	NIHSIG	77	0	79	66	
SUKKUR	338	379	462	635	LORALAI	44 0-	22	5	4.5	
LARKANA	255	290	362	505	ZHOB	W -	99	77	91	
NAWABSHAH	566	303	379	524	CHAGHAI	्र ।	다 (단)	C4 -	, n	
KHAIRPUR	546	296	705	573	KALAT	00 i	25.	r) 4 († 1	91	
HYDERABAD	955	1038	1206	1624	KHARAN	10	O 6	다 (4 7	
DADU	150	169	500	80 t 80 t 80 t	•	9 6	, ¢) v	4 C	
THARPARKAR	256	284	341	465	CASEEXABAD 0 20 1	0.C	1 0	1 ,	- r	
SANGHAR	9 0	22.6	277	282	SIBI	, v	o c	0 + M	n α	
THATIA	0 0	0 u) () r	7,7,7,7,7,7,7,7,7,7,7,7,7,7,7,7,7,7,7,	ŋ C	30	4 6	ò	
SADIN	2 00	N 00 00 00 00 00 00 00 00 00 00 00 00 00	7 4 7	1010	7 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	M M	98	, 44	72	
KAKACHI	-4	2286	200	101		10) C) VQ	. N	
					TURBAT	, KI	. 6	7.8	122	
			- T		GWADAR	7.5	67	79	66	
			-							

Table 24 District-Wise Projection of Rural Population

S)	1999)))			10041	14.0	777	70.4) n.	0.0	346	1300	1380	883	901	357	1010	272	1207	5 0 0 0 0 0 1	1739	294			•		7593	071	627	824	738	251	669	257	301	748	156	22.5	350	277	365	657	102
PERSONS	1987	,			17071	1324	0000	272	7 2 7	777	286	1055	1110	699	711	297	806	528	776	242	7.957	210					5014	701	7 7 6	539	481	163	4 5 S	169	203	495	109	323	234	486	236	7.0	. 41
000)	1982)			10/11	1228	1846	276	7.38	669	285	1007	1039	929	633	301	00 1 01 1 01	230	0 i	7.7	100	2/2				. 1	4020	. 96	354	420	372	75	648	133	7 / 5	401	N 10 1	205	:1 	(M)	176	7.1	1
	1980	1			0	1197	1803	282	748	672	289	666	1018	465	603	308	715	235	769	, V	እ 0 ሳ 0 ተ	000				1	3635	50	330	372	327	109	305	119	101	365.	년 1 0 년 년 1	, (X		340	1 7 T	0 7	
				0 10 3 2		MARDAN	PESHAWAR	KHYBER AGENCY	BAJUR & MAHMAND	KOHAT	KHURRUM	ABBOTTABAD	MANSHERA	KOHISTAN	O.I.KHAN	SWAZIRISTAN	3	N. EPZIKINIAN	60 C	7 T T T T T T T T T T T T T T T T T T T	0 Z S S S S S S S S S S S S S S S S S S				-		BALUCHISTAN	QUETTA	PLSHIN	LORALAI	2H0B	CHAGHAI	/ Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y	21111 ·		NASHERADAD Nama	1 D T S S S S S S S S S S S S S S S S S S		0 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	KAUZUAR	7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	- coco	acacac a
	1999		89256	48702)	1397	1371	1239	2452	2674	1792	3968	2158	671	1783	7 t t	אומ אומ אומ) \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	, o	, t 40 ×	4601	757	1677	22.00	1701	.0	108/3	1429	691	1253	1301	1996	7 6	1 v v v	0 4 6	0 0) 1 U	40	1 1 1 1 1 1 1	2,4			
	1987		86069	38507	1	1108	1116	1000	1962	2124	1392	3244	1709	250	000	1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	14.4	707	1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	111111111111111111111111111111111111111	N () ()	1363	1316	1795	1334	37.76	7.021	1063	535	939	266	1525	0 N	9 6		1000	100) / X	1 0 0 0	6 4 3			
: : :-	1982	-	02230	35257	1.7 1.7 1.5 1.	1018	1092	756	1844	1959	1212	3206	1567	247	A C A C A C A C	7 P) () () (0617	2051	3077	M COL	1189	1178	1606	1193	11260	, co	913	209	825	9.10	0.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	, u	1 10 00	, v	7 4 6	- X		1 6 4 6	000			
	1980		22776	34118		686	1097	950	1813	1906	1140	3236	1520	700	100	14.00	7.5	7 C	M 6	2970	3024	1119	1126	1535	1140	10761	5	854	505	782	O 1	107	100	1010	10,00	70.7	7 7 7	× × ×		3			
		2 4 H O	200	PUNJAB		ATTOCK	RAWALPINDI	2.3 MC C	פונית	SARGODHA	MIANWALH	TALVALARAD	2 C C C C C C C C C C C C C C C C C C C	7 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		OH PANA CID	SIALKOT	Z (MUZAFFARGARH	MULTAN	SAHIWAL	BAHAWALPUR	BAHAWALNAGAR	RAHIM YAR KHAN	VIHARI	CNIS) :	JACOBABAD	SHIKARPUR	20 X C X	LAICKANA		HYDERARAD	DADU	THARDARKAR		THATTA	BADIN	KARACHT	t			

District-Wise Projection of	Ratio of Urban Population
ble 25	

	7 anne 1	Rat Rat	Ratio of Urban Population	ban Por	nulation				
							:8		
	1980 -1981	1982 -1983	1987 -1988	1999	:	1980	1982 -1983	1987 -1988	1999
PAKISTAN	28.5	30.2	32.7	34.3		-			
PUNJAB	28.1	30.0	32.7	34.8	NWFP	12.6	13.6	15.0	15.9
ATTOCK	13.2	13.6	33.8	14.4	MARDAN	15.9	16.3	16-7	17.1
RAWALPINDI	55.4	28.7	63.5	66.3	PESHAWAR	31.7	4	P 4	7.0 60 7.0
というになる。	18 5	4.6	21.6	23 23 24 24	KHYBER AGENCY	00	0 0	00	0 0
SECOND SECOND	7 6	27.7	20 1	31.7	KOHAT	16.8	18.0	19.4	20.4
MIANEALE	17.2	16.8	15.8	16.0	KHURRUM	0	0.0	0	0.0
FAISALABAD	0	33.1	37.3	40.1	ABBOTTABAD	전 전 1	14.9	17.9	19.6
TANO COLON	22	24.5	27-6	29.7	MANORHRA	ກໍດ	4 0	4 C	v 0
7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	; ; -	200	0 0	26.5	NOT THE COLUMN TO THE COLUMN TWO THE	9 7	16.5	16.7	17.2
nen	1 00	19.0	20.3	2 2 2 2 2	S.WAZIRISTAN	0.0	0.0	0	0.0
GUJRANWALA	0	42.8	7.27	50.3	BANNU	8	ω M	8.7	0.0
SIALKOT	ö	21.6	22.8	24.0	N.WAZIRISTAN	0	0	0 0	0 0
D.G.KHAN	.	12.1	12.	13.4	DIR	0 0	0 0	0 0	9.0
MUZAFFARGARH	10 10 10 10 10 10 10 10 10 10 10 10 10 1	Q. S	ر در د در د	13	CHITRAL	9 6	2 V	9 0	oα
SCLTAN OCCUPA	٠.	27.4	, t	7	2		, 0	C	9 0
	7.00	, t.	7 4 4	2 6		2	.	•	
BAHAWALNAGAR	17.9	18.9	20.3	21.6					
RAHIM YAR KHAN	16.3	17.8	19.9	21.6					
VIHARI	13.6	14.7	16.0	17.2			,		•
CNIC	43.3	45.2	47.6	78,6	BALUCHISTAN	15.6	16.0	16.4	16.7
			:						
JACOBABAD	15.7	16.	17.5	œ.	QUETTA	ń	77. 2	80.0	81.2
SHIKARPUR	18.4	20	55	'n.	ZHENEC	φ (12.	M) U	7. v
RUNNING.	30.2		2, c	٠. ٢	1088LA1	0 1	pα	- d	, 0
1 A X X X X X X X X X X X X X X X X X X	7 7 7 7 7 7	1 5	0		CHAGHAI	0	, ω,	6.9	, ó , ví
X 2 4 7 3 0 2 1 2 1 3 2	 	28.	32.6	4	KALAT	9.8	4.8	83	4.8
HYDERABAD	45.9	46.	47.3	~	KHARAN	7.8	7.0	v	In
DADU	14.0	16.	15.9	ý	LASBELA	13.9	14.9	16.5	17.3
THARPARKAR	17,1	17.	7.6	2	NASEERABAD	۲.	. · ·	ထောဂ	0, 0 0, 0
SANGHAR	2.0	Si s	24.3	0 r	SHBI	2.1.2	2.7	λ.α 2.α	У.П.С. У. К.
AHAHHA	4.0	1.0		٠.	X OH =) C	o C	0	0
7 C C C C C C C C C C C C C C C C C C C	- M	10	96	5 96	KHUZDAR	8	8	8	80
4130000					PANJGUR	•	7.9	6.3	9.9
					TURBAT	13	13.8	13.7	φ. 1
		-			GWADAR	۲.	7.17	40.4	τα· γ

Table 26 District-Wise Projection of Wheat Production

				i i-	1		000)	TONS	
	1980	1982	1987	1999		1980	1982	1987	1999
	10 1	1707	1 1 8 8 8	2000		1981	-1983	-1988	-2000
PAKISTAN	11302	11744	14700	23807		. 8			
PUNJAB	8300	8749	109.53	17739	ር ዝ' X	815	706	1127	1824
ATTOCK	24.1	256	7.73	400		ć	,	,	(
RAWALPINDI	158	1,4) () () ()	\$ \d		» κ » κ) 1 1 1 1	\$ Y C	0 0
JHELUM	141	149	208	389	KHYBER AGENCY	13	212	in S in	09
GUURAT	37.9	368	526	7.6	BAJUR & MAHMAND	33	37	28	107
4 M G G G M M M M M M M M M M M M M M M	390.	417	417	531	KOHAT	27	09	73	115
TAUSALABAD	4 V	770	0 / 7 0 4 0	7 7 7 0	A D C C C C C C C C C C C C C C C C C C	1 H	7 6	۲- C	
CHANG	465	064	614	991	MANNERRA	4 K	2 7 7) (C	α 4 Δ 4 Ω
LAHORE	100	105	132	212	KOHISTAN	. 0	0	20	0
KASUR	324	342	450	744	D.I.KHAN	115	128	160	258
STELL THE TOTAL STATE OF THE ST	415	4 6 8 1	525	921	S.WAZIRISTAN	īV	v		17
#14#247.00) to	473	5.70	88 1	BANKC	111	124	168	291
2 H A C C C C C C C C C C C C C C C C C C	ή κ τ	4. t	0 6	40.4	N-WAZIKISTAN Oto	· •	۱ ۸	o i	70
MUZAFFARGARH	457	4. 4 7. 00 7. 00 7. 00	5.15	7 00	2 - T	y C		Λ (o co
MULTAN	872	920	1129	1788		0.0	4 V	4 0	200
SAHIWAL	266	1051	1272	1983	MALAKAND	, rv	79	76	1 6 9 F
BAHAWALPUR	274	289	395	069					•
BAHAWALNAGAR	266	280 280	35	584					
KARIM YAR KHAN	300	7 t	603 603	1098					
T-11-10-T-A	000	η Ο	1	761					
SIND	1949	1891	2368	3825	SALVIION FA	0 1 0	6	676	0
		t)		3	> :		
JACOBABAD	.92	7.7	\$	161	QUETTA	Ŋ	7	7	ĽΛ
SHIKARPUR	121	27	28	27	NIHOIL	15	7,	.15	74
LARKANA	30) (8) 4, k		7 C	LORALAI 7808	22	∞ ν	ن ب د	M é
NAWABSHAH	445	432	290	1021	CHAGHAI	٠.	o ^	- 0) H
KHAIRPUR	176	170	204	317	KALAT	S S	, c	28	γ 1 ω
HYDERABAD	232	225	584	657	KHARAN	2	· N	ŢΙ	ä
DADU	135	131	171	283	LASBELA	4-4	7	<u>ਜ</u>	ਦਾ
PARTAKAK PARTAKAK	246	530	275	607	NASEERABAD	119	100	129	212
0.5 T T T T T T T T T T T T T T T T T T T	0 0	516	410	687		60 i	N.	20	333
(Z L C < E	0 7	40	` ?	o c	AACEL South	0. (ස	10	16.
X X X X X X X X X X X X X X X X X X X	0 0	3 C	4 C	0 C	X C T C C C C C C C C C C C C C C C C C	N r	~ ;	٦,	7
	•	•	3	,	A CALCACA	u ••) -	t -	ν γ
					TURBAT	1 ←1	4 +-4	- i - e	- N
					GWADAR	0	0	10	ю
•								1	

Table 27 District-Wise Projection of Rice Production

)			
	1980 -1981	1982	1987	1999		1980 -1981	1982 -1983	1987	1999	
PAKISTAN	3120	3566	7077	6817						
0 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	1262	1487	2083	3224	6.13.23.23.23.23.23.23.23.23.23.23.23.23.23	105	란 단 단	137	213	
0 C 2 2 2	3	9 4.)	j					,	
ATTOCK	,0	Ö	0	0	MARDAN	⇔ (ਦੀ (← (r-I (
RAWALPINDI	0	0	0	o	PESHAWAR	N	NJ (V (
SULUKI	₽	Ň	ا	M	٠.	0	Ö.	5	5 (
GUJRAT	91.	113	150	546	BAJUR & MAHMAND	o .	0	0 1	0	
SARGODHA	2.2	68	123	210	KOHAT	- I	el I	N F	4 (
MIANWALI	Ο.	O	Ö	0	KHURRUM	~	. :		5	
FAISALABAD	52	79	22	120	ABBOTTABAD	ct I	Н (e-1 1	. ·	
524X7	31	36	55	87	MANSEHRA	ω·	O :	٠,	0 (
LAHORE	37	79	25	81	KOHISTAN	0	οj	0	o ;	
KASUR	50	72	85	126	D I KIAN	M ₹	13	18	57	
SHEIKHUPURA	227	281	323	465	S.WAZIRISTAN			0	ο.	
GUJRANWALA	303	376	977	629	BANNU	H	ret i	rd (-I (
SIALKOT	152	189	188	223	N.WAZIRISTAN	Ö	Ö (0, (0 1	
D.G.KHAN	7.7	52	75	132	DIR	27	24	7.7	2 (
MUZAEFARGARH	22	27	32	61.	CHITRAL	7	7 :	0	N C	
MULTAN	30	37	56	100	SWAT	59	r (i	34	η (Σ) ,	
SAHIWAL	133	165	215	349	MALAKAND	13	13	16	42	
BAHAWALPUR	20	52	40	7.4						
BAHAWALNAGAR	34	.27	58	103						
RAHIM YAR KHAN	29	tn M	52	76						
VIHARI	27	34	20	90		-				
SIND	1550	1700	2100	3250	BALUCHISTAN	103	9	70	150	
			. !	1			ć	C	¢	
JACOBABAD	366	403	495	165	GOE LIFE	5 0	> C	> c	. c	
SHIKARPUR	198	218	2/1	47.4	シエエクでん	Š ¢	.	•	, (
SUKKUR	M	56	, ,	4	LUKALAL	<u> </u>	o c	· c	Ö	
LARKANA	777	200	40.1	÷ -	7.000		oc	o c		
NAWABSHAH	7.	۲. ۲	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	,	T 大 に り な に り と	0	0 0	0.0	S C	
KHAIRPUR	vA I	Λ ['] :	4 i	٠. ز	- X - X - X - X - X - X - X - X - X - X	0 0	O C) ·C	o c	
HYDERABAD .	7.5	94	9	0 1	2474.	> (0 0	0	c	
DADU	152	167	215	341		э ·	Э С	> •	۰ د	
THARPARKAR	11	75	10	10	NASEERABAD	ė į	0 ;	el ;	. (
SANGHAR	•	7	4	Ö	RELEGIE	٥ ٥	. 99	H 6	4 C	
THATTA	140	163	151	146	XACHH	0	O 1	9 (> 0	
BADIN	546	270	373	979	KOHLU	O	0	Ó-	> (
KARACHI	0	0	0	0	KHUZDAR	7	-1		V (
					PANJGUR	O I	0		D 1	
	,				TURBAT	N	д (V	a c	
					GWADAK	>	>	>	>	

Table 28 District-Wise Projection of Cotton Production

				- 4					
	*.						200	200	
	1980	N.	1987	1999		1980	1982	1987	1000
	-1981	-1983	-1988	-2000	• • • • • • • • • • • • • • • • • • • •	-1981	-1983	-1988	-2000
				ξ.		4.			
AKISTAN	714	661	852	1152			•		
		٠.	٠.	i.,	10 miles				
HONDAG	727	448	578	763	O.L.A.	e i	-1 ,	۲4	ç-1
		;÷						٠.	
	Ģ	0	0	ġ	MARDAN	0	0	Ç	0
RAWALPINDI	0	0	0	0	PESHAWAR	0	0	0	
JRELUM	0	0	ç i ∵	H		0	0:	Ģ	C
GUJRAT	Ŧ	Ţ	٢	Ŋ	BAJUR & MAHMAND		0	•	c
SARGODHA	10	0		1.5	KOHAT	c	c	· c	
MIANWALI	O.	80		5	KHURRUM		C	C	o C
FAISALABAD	138	17	20	2	ARROTTARAD		c	• C	o c
LHANG	. (1	ņ		10				· (
LAHORE	C	, 0) -	ì	NA HOTHON	o c	> C	> C	> C
KASUR	7	Υ.		C	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	,	> =		
SHEIKHUPURA		۰۰ د	3 ~	o r	X4F0F0F0F0	C	-i (⊣ (н (
SHIPANEAL A.	•	ł e	1 6	J	-	0 0	0	<i>i</i> (
NTALKOT NOT	4 Ç	• •	1.	d c		> (> (> ()
2) 1) 1 <i>i</i>	• •	- , •	24-7744746	5 ()) 	3
2.14 And	7 (n (⊣ t	7 1	٠.	0	0	0	0
日とようとないようで		-11	v	4	<u> </u>	0	0	0	0
30L A2	21.	701	1.25	143	E A H	0	0	0	0
コオネーエイク	N	Δ.	2.4	tr O	MALAKAND	0	0	9	0
A TAKE	77	60	49	101					
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District-Wise Projection of	Production of All Industry
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Table 31 District-Wise Projection of Edible Oil Production

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Table 32 District-Wise Projection of Sugar Production

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	•	О П	О П	59 CHAGHAI	3 259 CHAGHAI	259 CHAGHAI	113 259 CHAGHAI
-		22 KALAT 0	9 122 KALAT 0	49 122 KALAT 0	9 49 122 KALAT 0
				NHARAN O	C KHARAN	C KHARAN	0 117 229 KHARAN
				0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 VICTOR 11 CA	
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		o	o	48 KACHI	6 148 KACHI	6 148 KACHI	Z 76 148 KACHI
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		# ± ± × × × × × × × × × × × × × × × × ×		S9 KOHLU O KHUZDA PANJGU TURBAT	O 359 KOHLU O KHUZDA PANJGU TURBAT GWADAR	O 359 KOHLU O KHUZDA PANJGU TURBAT GWADAR	S 150 359 KOHLU O C KHUJDA O PANUJDA TURBAT
·	12		SIBI KACHI KOHLU KHUZDAR PANJGUR TURBAT GWADAR		0 SIBI 6 148 KACHI 0 359 KOHIZDA 0 PANIGU TURBAT	148 KACKI 359 KAHLU 0 KHUZDA 0 PANJGU TURBAT	0 SIBI 6 148 KACHI 0 359 KOHIZDA 0 PANIGU TURBAT

							000)	CNOT	
	1980	1982 -1983	1987 -1988	1999 -2000		1980	1982 -1983	1987 -1988	1999 -2000
KISTAN	3538	4545	7810	13178			٠		
UNJAB	1333	1579	2325	3923	G H 73 Z	333	579	1573	2655
ATTOCK		0	0	0	MARDAN	0	Ö	0,	- !
RAWALPINDI	644	443	691	1166	PESTAWAR	0 (0	0 0 0	1674
JHELUM	ω	N	827	1395	KHYBER AGENCY	00	o c	> C	.
GUURATU	o c	o c	> C	, c	MAN WATER	0	246	248	419
WHANGED A	317	311	8 11 12	52.53			0	0	
FAISALABAD	0	0	0	0	ABBOTTABAD	333	89 89 89 89 89 89	M M	262
JHANG	0	0 (0 0	Ġ 6	AANSHRA AAHAA	o c) (э с	
LAHORE	0 0	> C	> c	> C	24 T X C C C	0	0.0	0	
KANUK ALBIKENONA	o c	o c	Э С	0	SWAZIRISTAN	0	0	0	0
GUURANEALA	0	0	0	o		0	Ö	O	0
SIALKOT			0	0	N.WAZIRISTAN	0	0	ο :	0 (
D. G. KHAN	0		967	837	DIR			> 0	> 0
MUZAFFARGARH	0 (0 0	0 0	0 0	CHELKAL	> C		o c	0
RULTAN	2 0		0	9	MALAKAND	0	0	0	0
BAHAWALPUR	0	0	0	0		٠.			
BAHAWALNAGAR	0	0	0	0	:				
RAHIM YAR KHAN	0	0	o .	0					
VIHARI		0	0	0					
QNIS	1872	2388	2917	4917	BALUCHISTAN	0		266	1683
6000	c	c	O	. 0	QUETTA:	.0	0	ın	80
	0			0	SILV	0	Ó	0	0
	240	240	240	405	LORALAI		ο (0 (0 6
LARKANA	0	0	0	0	2408	0 (0.0	0 6	ວ c
NAWABSHAR	0	0 (0	0	CHAGHAI	э.c	5 C	> 0	o c
KHAIRPUR	. L	C) 0) (7 7 0	7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	O C) C		0
HYDERABAD	0 C	2 4 0	248	4	LASBELA	0	Ó	266	1675
THARPARKAR			0		NASEERABAD	0	0	0	0
SANGHAR	0	0	0	٠.	SIBI	0	0	Ö	0,0
THATTA		270	546	921	KACHI	00	o c	.	o d
BADIN	, , C	74.0	000	7 7 7 6	K C C C C C C C C C C C C C C C C C C C	o	0	0	Ó
KARACHI	0	t O	J	3	_ =	0	0		0
\ \frac{1}{2}		1			TURBAT	0	0 (00	00
					GWADAR	>	>	>	.

Table 34 District-Wise Projection of Fertilizers Production

PAKESTAM 1005 1920 19		1. A		i.			- 1.4	0000	TON	1 - 4 - 4 - 4
100.6 1940 5016 6869 100.6 1202 2114 4716 NWFP 100.6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		1980	1982-	1987 -1988	1999		1980 -1981	1982	1987	1999
1066 1202 2114 4714 NWFP 10 0 0 0 KPSTAWARR 0 0 0 KPSTAWARR 0 0 0 KPSTAWARR 0 0 0 CKTTATA 0 CKTATA 0 CKTTATA 0 CKTATA 0 CKTTATA 0 CKTATA 0 CKTTATA 0 CKTTATA 0 CKTTATA 0 CKTTATA 0 CKTTATA 0 CKTATA 0 CKTTATA 0 CKTTATA 0 CKTTATA 0 CKTTATA 0 CKTTATA 0 CKTATA 0 CKTA	PAKISTAN	1605	1940	3016	6989		-1		. t-	
I 0 0 0 0 PESHAWAR 0 0 0 0 C SANAWAR 0 0 0 C SANAWAR 0 0 0 C SANAWAR 0 0 C SANAWAR 0 C C SANAWAR 0 C C SANAWAR 0 C C SANAWAR 0 C C C SANAWAR 0 C C C C C C C C C C C C C C C C C C	PUNJAB	1046	1202	2114	4714	NVRD	0	96	107	371
THE COLOR OF STANDS AGENCY O O O O BAJUR & MAHMAND O O O O O BAJUR & MAHMAND O O O O O O O O O O O O O O O O O O O	ATTOCK		0	0	.0	MARDAN	c	Ċ		Ç
NAMER AGENCY O C C C C C C C C C C C C C C C C C C	RAWALPINDI	· O			0	PESHAWAR	0	0	> 0) <u>C</u>
AN SEERABAD O O O O O O O O O O O O O O O O O O O		0	O	.0	.0	KHYBER AGENCY	6	0	0	0
75 87 110 245 KHURRUM 69 79 222 ABBUTTABAD 0 0 0 0 MANSTHRA 0 0 0 0 0 1.KHAN 0 0 0 0 0 1.KHAN 0 0 0 0 0 0 1.KHAN 0 0 0 0 0 0 1.KHAN 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	GUJRAT	0 (0 (0	0 (BAJUR & MAHMAND	0	0	0	.0
ARH 636 79 79 79 70 70 70 70 70 70 70	THOUSEN.	7.0	0 1	, O C	0 10	KOHAT	0	Ó,	0	0
RA 266 505 383 S.WALETAN O O O O COLLINAN O O O O COLLINAN O O O O O DIR KAND O O O O O O O O O O O O O O O O O O O	FAISALABAD	n 0	0 1	0 0	0 t	A B B D H I A B B D	э c :	0 6	0 0	1 0
ARH 636 305 853 853 853 853 853 853 853 853 853 85	LHANG	Ö	0	.0	,	AAHMANAM	c	Ç C	, C	10
AR 266 305 383 853 S.WAZIRISTAN 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	LAHORE	0	Ö	0	0	KOHISTAN	0	0	0	0
SA 266 305 383 S.WAZIRISTAN O O O O O O O O O O O O O O O O O O O	KASUR	0	0	.0	0	D.I.KHAN	0	0	0	0
ARH 636 731 920 2051 SWAT 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	SHEIKHUPURA	266	302	99 93 93	853	S.WAZIRISTAN	0	0	0	Ó
ARH 636 731 920 CHITRAL O CHITRAL CHITRAL O CHITRAL CHITRAL O CHITRAL C	まして ささな とうしゅ	o (0 -0	Ö (O (OANNO	0	o .	0	0
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636 731 920 2051 SWAT 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	MUZAFFARGARH) C) C	CHIRA	> c	> C	>	> C
SSP 642 795 1703 BALUCHISTAN 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	MULTAN	636	731	9.50	2051		o	c	> C) C
SSS 642 795 1703 BALUCHISTAN 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	SAHIWAL	o	O	0	0	¥	0		0	0
SS9 642 795 1703 BALUCHISTAN 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	BAHAWALPUR	0	0	0	0					e .
SS9 642 795 1703 BALUCHISTAN 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	BAHAWALNAGAR	0	0	0	0					
559 642 795 1703 BALUCHISTAN 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	KAHIM YAR KHAN	0	o	602	1343	· · ·				
559 642 795 1703 BALUCHISTAN 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	VIHARI	0	0	0	0					
559 642 795 1703 CDRALAI 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	SIND	1/1	642	295	1703	ALUCHISTA	. 0	0		60
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559 642 795 1703 EGRALAI 0 0 0 0 CHAGHAI 0 0 CHAGHAI 0 0 CHAGHAI 0 CHAGHAI	JACOBABAD	0	o _j	0	0	QUETTA	0	ó	0	81
00000000000000000000000000000000000000	ADLYAKEO CHIKAKEO	O (0 :	0 1	٠.,	NESPE	0	0	0	O.
C C C C C C C C C C C C C C C C C C C	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	ን (ሳ	0 4 7	n ($\overline{}$	LORALAI	0	0 1	0	0
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MASSERABAD O C C C C C C C C C C C C C C C C C C	× 20 00 00 00 00 00 00 00 00 00 00 00 00	o c	.)	o c	4 C P C P C P C P P C P P P P P P P P P	0 0	o (,	0 1
LASSELA O O O NASEERABAD O O SIBI O O O O O O O O O O O O O O O O O O O	HYDERABAD	c	c	ос	o c	2 0 0 1 1 1 1	o c	.	> C	> (
NASEERABAD O	DADU	0	0	0	0	LASSEL A	o c	o c	> 0	> C
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	THARPARKAR	0	0	0	0		0	0	c	9 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	SANGHAR	0	0	0	o			0	90	0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	THATTA	0	0	0	.	KACHI	0	0	0	0
O O O O O O O O O O O O O O O O O O O	SADIN	0	0	0	Φ.	KOHLU	0	0	0	0
0 0	KARACHI	0	٥.	О ,	0	KHUZDAR	O	0	0	0
		-				TANJOUR	0	0	0	0

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rojection	Production
-Wise P	Step D.
District-Wise Project	Iron & Steel F
rable 35.	

	Table 35		strict-W	ise Proj	District-Wise Projection of					٠
		Ĭ	Iron & Steel Froduction	sei Prod	ncnon		0000	(NOT 000)		
	1980	1982 -1983	1987 -1988	1999		1980	1982 -1983	1987 -1988	1999	
PAKISTAN	567	665	2392	6051						
PUNJAB	342	717	652	3025	G 4 3 2	20	54	72	60	
ATTOCK	0	Ö	ا اسم	۳,	MARDAN	00		0 6	0 0	
RAWALPINDI	אז C	M C	n c	4 C	PENTANAR KEYREN AGENCY	,	J	; 0	30	
SUJRAT	00	0	00	0	BAJUR & MAHMAND	0		0		
SARGODHA	0	0	0	0	KOHAT	0,0		0 0	o c	
MIANWALI	0	O (01	00	KHURRUM	00	0 0	o 0		
FAISALABAD	<u>ج</u> (- d C	v C	, C	MANOR TO A STATE OF THE STATE O	0		0	0	
LAHORE	232	281	775	2051	KOHISTAN	0		0	Φ.	
KASUR			0	0	DILKHAN	o (0 6	0.0	
SHEIKHUPURA	26	118	185	00 1, UI 0, G	S.WAZIRISTAN) ,c	> 0	
GUJRANWALA	о с		H	, c	N MAZIRISTAN			0	0	
2 X X Z Z		0	0	0	O I R	0		Ó	0	
MUZAFFARGARH	Ö	0	0	0	CHITRAL	0 (o (
MULTAN	00	00	00	0.0	SWAT	5 0		0 0	0	
MANIE AL	0	<u>,</u> 0		0		•			5.5	
BAHAWALNAGAR		0	0	0			٠.			
RAHIM YAR KHAN		O.	0	0		-				
VIHARI	Ó	0	0	0						
SIND	133	1,61	1716	5966	BALUCHISTAN	0	O	0	0	
	. •	•	. (•	- H	c	c	Ċ	c	
JACOBABAD	0.6	0 6	5 6	5 C	# 100 D	o, c	> C	• C	• 0	
SHIKARPUR	O C	9 0	0	00	LORALAI	0	0		0	
4 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4		0	0		2H08	0	0		0	
NAWABSHAH	0	0	0	0	CHAGHAI	0	0	0	0	
KHAIRPUR	0	0	0 !	0	KALAT	00	ο c	0 0	> C	
HYDERABAD	m (4 (V (÷ •	NAMATA .	> C	> C	o c	0	
DADU	9 0	0	0	0	NASEERABAD	0	0		0	
SANGHAR				0	SIBI	0	0	0	0 1	
THATTA	0	0		00	KACHI		00	o c	o c	
SADIN	0,0	0 0	0 1471	280	KUHLO KHH70AR) 0	, 0) O	, 0	
KAKACHI) 1	7	5	,	PANJGUR	0	0		0	
-		v.		 	TURBAT	00	00	0 C	Θ C	
	٠	٠.			פאאראא	>	,			

Table 36 District-Wise Projection of Coal Production

1980 1982 1987 1989 1980 1988 1989					1			000)	TONO	
1720 2506 6419 14457 1801 1802 1805 1807 1807 1808 1807 1808 18		1980		1987 . -1988	1999		1980 -1981	1982	1987	1999
K. K	PAKISTAN	1720	2506	6419	14457					•
Name	PUNJAB	0.27	685	2146	7927	NWEP	7 7	62	184	529
PINDI 0 0 0 PESNAMAR 42	ATTOCK	0	···o	0	0	MARDAN	0	Ö	0	
NA 100 0 0 0 0 0 0 0 0	RAWALPINDI	0	0	0	0	PESHAWAR	7.5	61.	134	52
DDH TO THE TO TH	ED UIL	0	ο΄.	ο .	0	KHYBER AGENCY	0	0	0	
THE TOTAL TO	GUJRAT	0 0	O 6	0 (0 (BAJUR & MAHMAND	0 (Ö (0 (
THERE TO THE TO	UPRGODER A	, 1	O 14	-		- 6 6 6 7 8 8	S C	>	5 6	
HUPURA HU	T T W W T T W	†	n C	 	n		o c	> c	> C	
ENGRARA O C C C C C C C C C C C C C C C C C C		o c	o c	o c) c	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	c	oc		
HUPURA O O O O S.WAZERISTAN O O O O BANAZERISTAN O O O O CHIRAL O O O O CHIRAL O O O O CHIRAL ALPINE ALLNAGAR O O O O O O O O O O O O O O O O O O O	LAHORE	0	0	0	0	KOHISTAN	Ö	0	0	
HANDERA O O O S.WAZIRISTAN O O O O O O O O O O O O O O O O O O O	KASUR	0	0	0	Ö	D. I. KHAN	0	0	0	
NWALA O O O N.WAZIRISTAN O O O O O O O O O O O O O O O O O O O	SHEIKHUPURA	0	0	o	0	S.WAZIRISTAN	0	0	0	
HANGERH O O O N.WAZIRISTAN O O O O O O O O O O O O O O O O O O O	GUJRANWALA	0	0	0	0	BANNU	0	o	0	
FARGARH 0 0 0 0 CHITRAL 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	SIALKOT	0	0	0	0	N.WAZIRISTAN	0	0	0	
FARGARH 0 0 0 CHITRAL 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	D.G.KHAN	o	o	0	0	DIR	0	0	0	
ALALPUR O 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	MUZAFFARGARH	0	o	0	0	CHITRAL	o O	0	0	
ALPUR 0 0 0 0 MALAKAND 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	MULTAN	0	0	0	0	SWAT	o ·	0	0	
ALPURR O 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	SAHIWAL	0	0	0	0	MALAKAND	0	0	0	
ALNAGAR O O O O O O O O O O O O O	BAHAWALPUR	0	0	0	0			·		
TYAR KHAN 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	BAHAWALNAGAR	0	o	0	0					
ABAD 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	RAHIM YAR KHAN	0	0	0	0					
ABAD 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	VIHARI	0	0	0	0			-		
ABAD 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	SIND	206	300	11.42	3074	BALDCHISTAN	1002	1460	2947	609
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0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	JACOBABAD	0	0	0	0	QUETTA	0	0	0	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	SHIKARPUR	o i	0	0 1	o .	ZHISHO	407	00	1196	247
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able 37 District-Wise Projection of Crude Oil Production

	Table	57 Dist	rict-wis	e Projec	District-wise Projection of Crude On Flourchon	roduction			
				*			C000 TON)		
	1980 -1981	1982	1987	1999		1980	1982 1987 -1983 -1988	1999	
AKISTAN	532	619	1057	2417					
JUNJAB	585	619	1057	2417	መደ መ		O	0	
ATTOCK	557	529	406	2067	MARDAN	0.0			
RAWALPINDI	6 6	O O ⊖ Ø	136	313	PESHAWAR KHYBER AGENCY	00	5 Q	00	
· [- 1	0		00	• •	SAJUR 8	o c	: o c		
SARGODHA	0 0	00	0) (KHURRUM	0			
FAISALABAD		0	0 (00	ABSOTTABAD	00	0 0		
LHANG	00	00	o c	o	KOHISTAN	0	0	•	
KASUR	0	0	0	0	D. I.KHAN	0	o		
SHEIKHUPURA	0	0	0	0	S.WAZIRISTAN	0 (0.0		
GUJRANWALA	0	0 (00	0 0	DANNO DA	o c	o C		
SIALKOT		D C	.	5 C	4 4 7 7 4 8 1 8 1 8 1 8 1 8 1 8 1 8 1 8 1 8 1 8	0	, O		
D.G. KRAN	> C	0			CHITRAL		O		
MULTAN	0	0	0		SWAT	0	о		
SAHIWAL		0	0	0	MALAKAND	0	0		
BAHAWALPUR		O C	00	οс				•	
OPERATOR AND KEEK	oc	, c	0	0					
د د			0	0					
2	c	0	0		BALUCHISTAN	ó	•	0	
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JACOBABAD	Ö	0		0	QUETTA	0 (0 (
SHIKARPUR	0.0	0 0	00	0 6	ZHESHO.	э с	> c		÷
SUKKUR) C			0 0	ZHOB	0	0		•
LARKANA		0	0	0	CHAGHAI	0	0		
KHAIRPUR	0	0	0	0	KALAT	0	o' -		
HYDERABAD	0	0	0	0	KHARAN	0	0 (
nava		00	00	00	LASBELA	> C	> C		
HARPARKAR) C		o c		0	0		
SANCHAR	9 0	0			KACHI	0	0		
BADIN	0	o ·	0	0 (KOHLU	0 0	; ·		
KARACHI	0	0	D	D.	MAU 2 D A R	o c	o o	٠	٠
					TURBAT			0	
			-		GWADAR	0	0		

Table 38 District-Wise Projection of Petroleum Products Production

		1 400) M	Petroleum	Products Production	ជ			
	٠						000>	CNOL	4. /.
	1980	1982 -1983	1987	1 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		1980	1982 -1983	1987 -1988	1999
PAKISTAN	4259	4688	6234	12499					
PUNJAB	493	573	026	2211	0.u.3.z	0	:	0	0
ATTOCK	267	573	970	2211	MARDAN		0	0	0
RAWALPINDI	0				PESHAWAR	0	0	0	0
ED IIII ↑	0 (0 (KHYBER AGENCY	0 0	0 0	00	0 0
00000000000000000000000000000000000000	00	э c	O C	> C	SACTATION SERVICES	O		0	0
T		O		0	XXURBUE	0		0	
FAISALABAD	00	0		0	ABBOTTABAD	O	0	0	0
D'AT T	٥	0	•		MANNEHRA	0	0	0	0
LAHORE				0	KOHISTAN	0	0	0	0
KASUR	0	0	0	0	D.I.KHAN	0	0	0	
SHEIKHUPURA	0	0		0	S WAZIRISTAN	0 (0 (0 (
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	> C								
RAHIM YAR KHAN	0	0		0					
VIHARI	0	O		0					
		-		:					:
SIND	3766	4115	5264	10288	BALUCHISTAN		0	0	0
JACOBABAD	0		0	0	QUETTA		0	0	
SHIKARPUR	0	0			NIRSIA	Ó	•	0	0
SUKKUR	0	0			LORALAI	0	0	0	0 (
LARKANA	0			j.	ZHOB	0 1	0	0	0 (
NAWASSHAH	0	0			CHAGHAI	0 (0 0	00	0 0
KHAIRPUR	0		r		XALX-	> C	> 0) C
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411411	C				H T U X	0	ô	٥	0
BADIN	0	0			KOHLU	0	0	0	0
KARACHI	3766	4115	5264	1028	KHUZDAR	0	0	0	0
					PANJGUR	0	0	0.0	0 0
			\$ s	14 14 14 14 14 14	TORBAT	5 0	> c	> C	> C
		*:			CWACAR	> 		>	>

II. MÁCROSCOPIC TRAFFIC DEMAND

- 1. Plot of Regression Analysis
- 2. Port Traffic Projection

II. MACROSCOPIC TRAFFIC DEMAND

1. Plot of Regression Analysis

Fig. 1 and Fig. 2 show the plot of actual and fitted values of domestic traffic volume. These fitted values are obtained from regression models which are adopted in this study.

2. Port Traffic Projection

1) Assumption and/or Model for Projection

Wheat

$$ADMD = -3915 + 0.12479 POP + 1111 PGDP$$

r = 0.9922

where

ADMD: 3 year moving average consumption of wheat

POP : Population

PGDP: Per capita GDP

Rice

Per capita consumption in the past is almost constant. Therefore, the level of per capita consumption of rice in future excluding 1982–83 is assumed to be as high as the average during the period 1971–72 to 1980–81. In 1982–83, it is assumed that the level in 1980–81 will be remain.

Cotton

$$\log PDMD = 2.05008 - 0.15188 \log T$$

r = 0.6334

where

PDMD: Per capita consumption of cotton

T: Time trend (1971-72=1...1980-81=10)

Sugar

$$\log DMD = -6.43952 + 1.06096 \log GDP$$

r = 0.6334

where

DMD: Per capita consumption of cotton

GDP: GDP at 1980-81 constant prices

Fertilizers

Consumption of fertilizer by crop

CW = -463 + 0.08772 PW	r = 0.9611
CR = -171 + 0.08976 PR	r = 0.9420
CS = -12.3 + 0.00337 PS	r = 0.5581
CC = -45.4 + 0.11738 PC	r = 0.3079

where

CW: Consumption of fertilizer for wheat

CR: Consumption of fertilizer for rice

CS: Consumption of fertilizer for sugarcane

Fig. 1 Plot of Actual and Fitted Values of Domestic Passenger Traffic

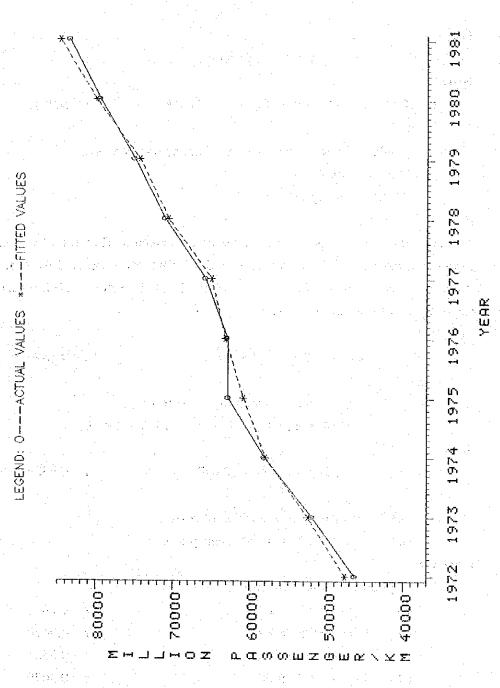
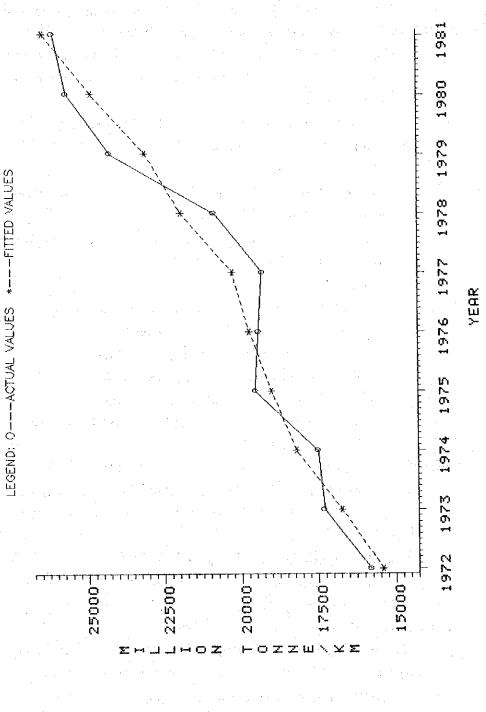


Fig. 2 Plot of Actual and Fitted Values of Domestic Cargo Traffic



CC: Consumption of fertilizer for cotton

PW: Production of wheat PR: Production of rice

PS: Production of sugarcane

PC: Production of cotton

Value of correlation coefficient are low in case of sugarcane and cotton. As a result, the regression forms are changed as follows:

$$\log \text{CS/PS} = -6.46531 + 0.33527 \log \text{T}$$

r = 0.6591

$$\log CC/PC = -3.23795 + 0.86264 \log T$$

r = 0.9039

where

T: Time trend (1971-72=1...1980-81=10)

Consumption of fertilizer by nutrient

MCRP = CW + CR + CS + CC

TOT = -16.7 + 1.17985 MCRP r = 0.9996

 $\log N = 5.64977 + 0.35517 \log T$ r = 0.8217

 $\log P = 3.33822 + 0.84402 \log T$ r = 0.9419

 $\log K = -0.46807 + 1.05397 \log T$ r = 0.8976

where

MCRP: Consumption of fertilizer for major crops

TOT: Total consumption of fertilizer

N : Consumption of nitrogen fertilizer

P : Consumption of phosphate fertilizer

K : Consumption of potassium fertilizer

T : Time trend (1971-72=1...1980-81=10)

Subject to TOT = N + P + K

Cement

$$DMD = -4892 + 0.075933 POP + 892.5 PGDP$$

r = 0.9886

(4.37)

(1.22)

where

DMD: Consumption of Cement

POP: Population

- PGDP: Per capita GDP

Iron & Steel

ADMD = -6.64551 + 6.1771 PGDP

r = 0.9085

where

ADMD: 3 year moving average per capita

consumption of iron & steel

PGDP: Per capita GDP

Phosphate Rock/Sulpher

$$DMD = -114 + 0.51947 PDT$$

r = 0.8142

where

DMD: Consumption of phosphate rock/sulpher

PDT: Production of fertilizers in terms of nutrient tonnes

Coal

It is assumed that the import of coal will be used for Karachi Steel Mills. Figures for imported coal had been extracted from the Fifth-Five Year Plan.

Iron Ore

It has been done in a way similar to coal.

Import of Other Dry Cargoes

$$ADMD = -2140 + 0.046393 POP$$

r = 0.9865

where

ADMD: 3 year moving average per capita

consumption of other dry cargoes

POP : Population

Export of Other Dry Cargoes

$$\log EXP/GDP = 1.89875 - 0.32559 \log T$$

r = -0.9335

where

EXP: Export of other dry cargoes

GDP: GDP at 1980-81 constant prices

T : Time trend (1971-72=1...1980-81=10)

Crude Oil

$$DMD = -283 + 0.02561 GDP$$

r = 0.9331

where

DMD: Consumption of crude oil including import of petroleum products

GDP: GDP at 1980-81 constant prices

Petroleum Products

$$PDT = 758 + 0.570980 OIL$$

r = 0.9405

DMD = 1189 + 0.008137 GDP

r = 0.8845

where

PDT: Production of petroleum products

OIL: Supply of crude oil including import of petroleum products

DMD: Consumption of petroleum products excluding import

GDP: GDP at 1980-81 constant prices

Edible Oil

$$log PDMD = 1.14215 + 0.58016 log T$$
 $r = 0.9664$ where

PDMD: Per capita consumption of edible oil

Takes 1 Time trend (1971-72=1...1980-81=10)

Molasses

$$AEXP = -492 + 0.027385 APDT$$
 $r = 0.8863$ where

AEXP: 3 year moving average export of molasses

APDT: 3 year moving average sugarcane production

2) Projected Per Capita Consumption

Table 1 shows the projection of per capita consumption of selected commodities in terms of index numbers. The per capita consumption of iron & steel, sugar, fertilizers and crude oil (including import of petroleum products) expected to increase over two times during the period 1981-2000. As for other selected commodities excluding cotton, it is expected to increase less than two times.

医假性骨部畸形 人名西德里

Comparison with Other Reports

It is useful to make a comparison with other reports which is shown in Table 2. The absolute volume of per capita consumption prepared by other reports is comparable as their used data is different or not known. Therefore, comparison has made in terms of index numbers, set at 100 for 1980-81.

Swan Wooster Engineering Co., Ltd. (SWEC) issued "Forecast of Seaborne Trade for Pakistan" on April, 1978. SWEC projected much the same commodity as JICA Study Team. There is not so much difference projections between SWEC and JICA excluding cotton and petroleum products. In the projection of per capita consumption of cotton, JICA Study Team projected based on the trend which was declining as against SWEC which projected based on the incomes increase. Usually, the results of these two approach will be not so much different. It is considered that its difference results is mainly due to the difference of base year projection.

With regard to petroleum products excluding import, it is indicated to decrease in the SWEC projections which was done by based on the assuming low growth rate (1.3% per annum) for domestic production.

Canadian International Development Agency (CIDA) issued "Foodgrains Storage and Handling Master Plan" on April, 1980. Upto the year 1987—88, CIDA projected the consumption of wheat and rice based on the per capita consumption which was obtained from the Nutrient Cell, Planning Division, Ministry of Food and Agriculture. Both wheat and rice, projected per capita consumption by CIDA is a little greater than JICA projections.

ESCAP issued "Pakistan's Pattern of Development and Prospects" which was

Table 1 Index Numbers of per Capita Consumption by Commodity (1980-81 = 100)

Year	Wheat	Rice	Cotton	Sugar	Edible oil
1971-72	86	127	141	62	28
1972-73	97	100	154	87	29
1973-74	96	121	184	90	43
1974-75	99	129	132	65	51
1975-76	97	93	115	83	57
1976-77	92	99	116	91	68
1977-78	1.01	111	130	105	64
1978-79	103	107	111	71	84
1979-80	99	116	132	76	89
1980-81	100	100	100	1.00	100
1982-83	100	100	112	97	100
1987-88	107	110	106	122	122
1999-2000	123	110	98	207	166
			and the second second	And the second second	the control of the co
* *				- 1	~ 1
	1 _		—	1)	
Year	Cement	Iron &	Fert.i-	Crude	Petroleum
•	Cement	Iron & steel	Ferti- lizers		
Year		steel	lizers	Crude oil	Petroleum products
Year 1971-72	68	steel 77	lizers	Crude oil 84	Petroleum products
Year 1971-72 1972-73	68 75	77 90	lizers 47 52	Crude oil 84 84	Petroleum products 106 100
Year 1971-72 1972-73 1973-74	68 75 75	77 90 77	1izers 47 52 46	Crude oil 84 84 88	Petroleum products 106 100 98
1971-72 1972-73 1973-74 1974-75	68 75 75 85	77 90 77 102	1izers 47 52 46 48	Crude oil 84 84 88 85	Petroleum products 106 100
Year 1971-72 1972-73 1973-74 1974-75 1975-76	68 75 75 85 90	77 90 77 102 78	1izers 47 52 46 48 60	Crude oil 84 84 88 85 77	Petroleum products 106 100 98 102
Year 1971-72 1972-73 1973-74 1974-75 1975-76 1976-77	68 75 75 85 90 85	77 90 77 102 78 89	1izers 47 52 46 48 60 66	Crude oil 84 84 88 85	Petroleum products 106 100 98 102 93
Year 1971-72 1972-73 1973-74 1974-75 1975-76 1976-77 1977-78	68 75 75 85 90 85 89	77 90 77 102 78 89 106	1izers 47 52 46 48 60	84 84 88 85 77 78	Petroleum products 106 100 98 102 93 88
Year 1971-72 1972-73 1973-74 1974-75 1975-76 1976-77 1977-78 1978-79	68 75 75 85 90 85 89	77 90 77 102 78 89 106 94	1izers 47 52 46 48 60 66 73 87	84 84 88 85 77 78 93	Petroleum products 106 100 98 102 93 88 103
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Year 1971-72 1972-73 1973-74 1974-75 1975-76 1976-77 1977-78 1978-79 1979-80 1980-81	68 75 75 85 90 85 89 96	77 90 77 102 78 89 106 94	1izers 47 52 46 48 60 66 73 87 100	84 84 88 85 77 78 93 95	Petroleum products 106 100 98 102 93 88 103 95 100
Year 1971-72 1972-73 1973-74 1974-75 1975-76 1976-77 1977-78 1978-79 1979-80	68 75 75 85 90 85 89 96 101 100	77 90 77 102 78 89 106 94 113	1izers 47 52 46 48 60 66 73 87 100 100	Crude oil 84 84 88 85 77 78 93 95 101	Petroleum products 106 100 98 102 93 88 103 95 100 100

Notes: 1) Including imports of petroleum products

2) Excluding imports

prepared by Dr. Moin Baqai for the project on New Pattern and Strategies of Development in the ESCAP region for DD3 (1980–89) on August, 1979. Projected per capita consumption of wheat by ESCAP is almost same level as JICA projections. However, in the case of rice, sugar, edible oil and petroleum, projected level of per capita consumption is greater than JICA projection. It is considered that the reason of this difference results between ESCAP and JICA is mainly due to the difference of base year for projection similar to the comparison with SWEC.

Comparison with Other Countries

It has been made to compare with other countries in the ESCAP region for the consumption of foodgrains and liquids energy in 1978.

Table 2 Comparison of per Capita Consumption Projections (1980-81 = 100)

			1.)	2)	3)
Commodity	Year	JICA	SWEC	CIDA	ESCAP
Wheat	1982-83	100	101	103	102
	1987-88	107	104	111	108
	1999-2000	123	112		124
Rice	1982-83	100	102	105	104
	1987-88	110	108	. 117	115
The second second	1999-2000	110	126	-	141
Cotton	1982-83	112	105		
Nas a	1987-88	106	115		计分类系统
	1999-2000	98	146	2.3	18 34484
				the state of the state of	
Sugar	1982-83	97	107	production of the second	108
	1.987-88	122	129	ekster og er e	1,42
	1999-2000	207	201.		283
Edible oil	1982-83	100	105		114
TMIDIC OIL	1987-88	122	119		143
	1999-2000	166	158		286
					-
Cement	1982-83	109	105		
and the state of the state of	1987-88	128	124		
	1999-2000	168	196		
· · · · · · · · · · · · · · · · · · ·	1000 00		110		e to a to a wind
Iron & steel	1982-83 1987-88	114 154	110 141	West of the second	
	1999-2000	284	258		
	. 1999 2000	204	230		
Fertilizers	1982-83	105	J10		si viziti
	1987-88	139	127		
	1999-2000	205	150	ang sa marana	
	Almanija (1966) Producenski se se se se se	a)	a)	And the second of the second of	c)
Crude oil	1982-83	105	102	44	110
	1987-88	128	108		144
	1999-2000	207	148		272
Petroleum	1982-83	b)	b) 104		
products	1982-83	110	98		
Products	1999-2000	152	85		
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Source: 1) Forecast of Seaborne Trade for Pakistan
(Swan Wooster Engineering Co., Ltd.; April, 1978)

(Swan Wooster Engineering Co., Ltd.; April, 1978)

2) Foodgrains Storage and Handling Master Plan
(Canadian International Development Agency; April, 1980)

3) Pakistan's Pattern of Development and Prospects
August, 1979

Note: a. Including imports of petroleum products

b. Excluding imports

c. Including petroleum products

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Fig. 3 shows the comparison of per capita consumption of foodgrains (wheat and rice). It is indicated that the position of Pakistan is below the average with the difference of 10%. For the countries in the ESCAP region, existing average per capita consumption of foodgrains is around 179kg per annum which is close to be adopting projection (168kg) for Pakistan in the year 1999–2000 by this study.

Fig. 4 shows the correlation between per capita income and consumption of liquids energy. It is indicated that income elasticity of demand is about 1.08. An attempt has been made to project the per capita consumption of liquids energy using by above elasticity as follows:

	1980-81	1987-88	1999-2000
Per capita income (million Rs.)	2.972	3.856	6.223
Per capita consumption			
(Index numbers, 1980–81 = 100)	100	132	222

The result of projection using by above elasticity is close to be adopting projection by this study.

3) Surplus/Deficit Conditions

Wheat

Based on the projected consumption and production of wheat after making a 10% allowance for wastage and seed, the resulting trade is shown in Table 3. It should be noted that wheat was one of the major import commodity but it will be turn to be exported in 1999–2000. The export ratio to net availability in 1999–2000 will be 3.1%, in absolute terms about 640 thousand tons of wheat will be exported. On the other hand, in the period up to the year 1987–88, it will remain to be imported the range from about 300 thousand tons to 500 thousand tons.

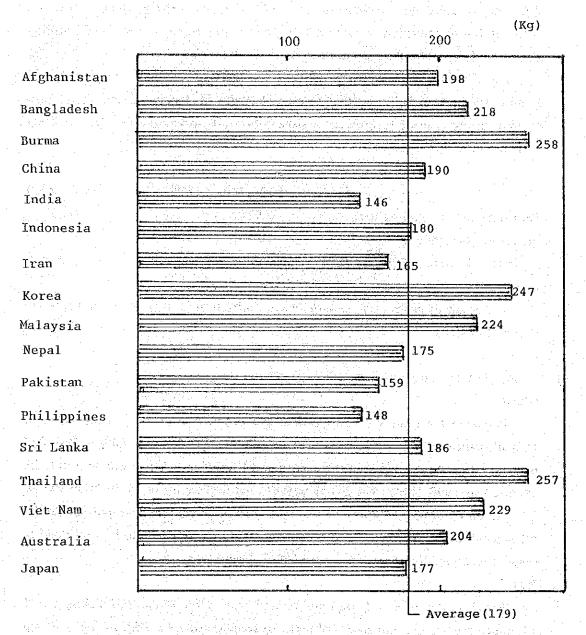
Rice

Based on the projected consumption and production of rice after making a 10% allowance for wastage and seed, the resulting trade is shown in Table 4. A continuing surplus in rice is projected up to the year 1999–2000. The surplus ratio to net production will be up from 43.4% in 1980–81 to 50.7% in 1999–2000. In absolute terms, the export volume of rice will increase from about 1.3 million tons in 1980–81 to 1.6 million tons in 1999–2000.

Cotton

Table 5 shows the production, consumption and export surplus of raw cotton. Over the past 10 years, the average volume of cotton exports was about 160 thousand tons as against 600 thousand tons in the average production. The export volume of

Fig. 3 Per Capita Consumption of Foodgrains (Wheat and Rice) in the ESCAP Region in 1978

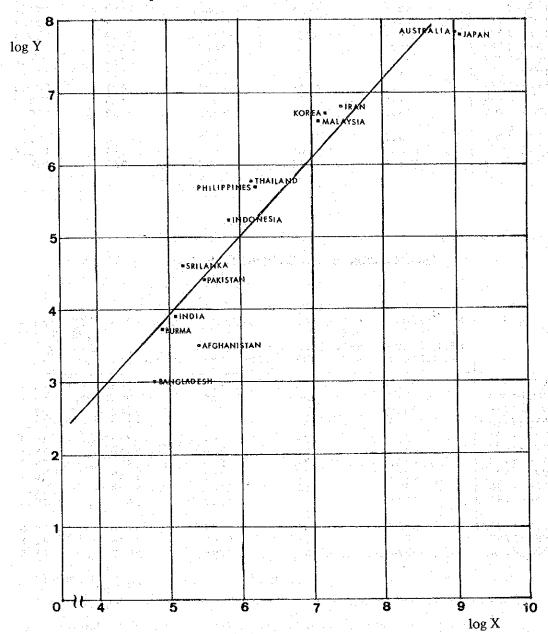


Source: Handbook on Agricultural Statistics for Asia and the Pacific 1980 (United Nations)

Correlation between per Capita Income and Consumption of Liquids Energy in ESCAP Region (1978)

 $\log Y = -1.46921 + 1.0805 \log X$ r = 0.95

Y: Per capita consumption of liquids energy X: Per capita income



Source: Statistical Yearbook (United Nations)

Table 3 Projection of Seaborne Trade (Wheat)

YEAR	PREVIIOUS YEAR'S PRODUCTION	ALLOWANCE WASTE & SEED(10%)	<pre>IMPORT(-) EXPORT(+)</pre>	CONSUMPTION	PER CAPITA CONSUMPTION
	(1000TON)	(1000TON)	(1000TON)	(1000TON)	(KG)
1971-1972	6476	647	-715	6543	103.1
1972-1973	6890	689	-1358	7559	115.7
1973-1974	7442	744	-1024	7721	114.6
1974-1975	7629	762	-1414	8280	119.1
1975-1976	7673	767	-1422	8327	116.1
1976-1977	8691	869	-394	8215	110.0
1977-1978	9144	914	-967	9196	120.5
1978-1979	8367	836	-2161	9691	123.1
1979-1980	9950	995	-653	9608	118.3
1980-1981	10805	1080	-308	10032	119.7
1982-1983	11517	1151	-347	10712	119.9
1987-1988	14054	1405	-527	13175	128.4
1999-2000	22869	2286	643		146.9

Table 4 Projection of Seaborne Trade (Rice)

YEAR	PREVIIOUS YEAR'S PRODUCTION	ALLOWANCE WASTE & SEED(10%)	EXPORT C	ONSUMPTION	PER CAPITA CONSUMPTION
	(1000TON)	(1000TON)	(1000TON)	(1000TON)	(KG)
1971-1972	2200	220	414	1565	24.7
1972-1973	2262	226	760	1275	19.5
1973-1974	2330	233	508	1588	23.6
1974-1975	2455	245	454	1755	25.2
1975-1976	2314	231	783	1299	18.1
1976-1977	2618	261	910	1446	19.4
1977-1978	2737	273	806	1657	21.7
1978-1979	2950	295	1008	1647	20.9
1979-1980	3272	327	1106	1838	22.6
1980-1981	3216	321	1257	1637	19.5
1982-1983	3335	333	1259	1742	19.5
1987-1988	4222	422	1593	2206	21.5
1999-2000	6574	657	2998	2918	21.5

Table 5 Projection of Seaborne Trade (Cotton)

YEAR	PRODUCTION	EXPORT	CONSUMPTION	PER CAPITA CONSUMPTION	
	(1000TON)	(1000TON)	(1000TON)	(KG)	
1971-1972	708	281	427	6.73	
1972-1973	702	223	479	7.33	
1973-1974	659	68	591	8.77	
1974-1975	634	197	437	6.29	
1975-1976	514	121	393	5.48	
1976-1977	435	23	412	5.52	
1977-1978	575	102	473	6.20	
1978-1979	473	56	417	5.30	
1979-1980	728	217	511	6.29	
1980-1981	714	315	399	4.76	
1982-1983	661	185	476	5.33	
1987-1988	852	334	518	5.05	
1999-2000	1125	4.92	633	4,66	

cotton will increase from 315 thousand tons in 1980-81 to 334 thousand tons in 1987-88, 492 thousand tons in 1999-2000. As for the export ratio to production, it will be up to 39.2% in 1987-88 and 43.7% in 1999-2000 as against 26.7% in the average of past 10 years. The absolute volume of cotton exports is not so much, but cotton is one of the most important commodity because of its high unit value among the export commodities and earning of foreign exchange for Pakistan.

Sugar

Table 6 shows the production, consumption and surplus-deficit of refined sugar. During the past 10 years excluding 1972–73, the supply-demand of refined sugar was almost balanced of import which was less than 100 thousand tons. In future, but it will be turn to be exported after 1987–88. The export volume of refined sugar worked out 94 thousand tons in 1987–88 and 266 thousand tons in 1999–2000.

Cement

Table 7 shows the production, consumption and surplus-deficit of cement. During the past 10 years, it should be noted that cement was exported in the first half of 1970's but after 1977–78 it turned to be imported because of high increasing consumption. In future, the production of cement is expected to increase at a rate of 7.2% per annum as against 5.5% per annum for consumption. As a result, it will be turn to be exported again during the Sixth Five Year Plan.

Iron & Steel

Table 8 shows the production, consumption and surplus-deficit of iron & steel which is including M.S. products. In future production, it is projected based on the

Table 6 Projection of Seaborne Trade (Sugar)

YEAR	PRODUCTION	IMPORT(-) EXPORT(+)	CONSUMPTION	PER CAPITA CONSUMPTION	
	(1000TON)	(1000TON)	(1000TON)	(KG)	
1971-1972 1972-1973 1973-1974 1974-1975 1975-1976 1976-1977 1977-1978 1978-1979 1979-1980 1980-1981	375 429 608 502 630 736 861 607 586 851	-62 -197 -61 0 -29 -11 -20 -10 -98	437 626 669 502 659 747 881 617 684 925	6.88 9.59 9.93 7.22 9.19 10.00 11.54 7.84 8.42 11.04	
1982-1983 1987-1988 1999-2000	897 1481 3366	-63 94 266	960 1387 3100	10.75 13.51 22.84	

Table 7 Projection of Seaborne Trade (Cement)

YEAR	PRODUCTION	<pre>IMPORT(-) EXPORT(+)</pre>	CONSUMPTION	PER CAPIT CONSUMPTIO
	(1000TON)	(1000TON)	(1000TON)	(KG
1971-1972	2605	540	2065	32.5
1972-1973	2876	520	2356	36.0
1973-1974	3145	699	2446	
1974-1975	3320	483	2837	and the second of the second o
1975-1976	3196	98	3098	43.1
1976-1977	3071	13	3058	40.9
1977-1978	3224	-34	3258	42.6
1978-1979	3023	-630	3653	46.4
979-1980	3343	-611	3954	48.6
1980-1981	3538	-444	3982	47.5
1982-1983	4545	-142	4687	52.4
1987-1988	7810	1467	6343	
1999-2000	13178	2208	10970	80.8

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Table 8 Projection of Seaborne Trade (Iron & Steel)

YEAR	PRODUCTION	IMPORT(-) EXPORT(+)	CONSUMPTION	PER CAPITA CONSUMPTION
	(1000TON)	(1000TON)	(1000TON)	(KG)
1971-1972	166	-383	549	8.65
1972-1973	184	-472	656	10.04
1973-1974	218	-364	582	8.64
1974-1975	224	-570	794	11.42
1975-1976	231	-395	626	8.73
1976-1977	270	-476	746	9.99
1977-1978	315	-589	904	11.84
1978-1979	362	-463	825	10.48
1979-1980	421	-608	1029	12.67
1980-1981	495	-442	937	11.18
1982-1983	599	-536	* * * * * * * * * * * * * * * * * * * *	12.71
1987-1988	2392	630	1762	17.17
1999-2000	6051	1735	4316	31.79

Karachi steel mill which has been started trial production since August 1981 will be completed during the Sixth Five Year Plan. Therefore, the production of iron & steel is projected to increase at a rate of 14.1% per annum from 495 thousand tons in 1980–81 to 6051 thousand tons in 1999–2000 as against to increase at a rate of 8.4% per annum from 937 thousand tons in 1980–81 to 4316 thousand tons in 1999–2000 for consumption. As a result, iron & steel was import commodity but it will be turn to be exported during the Sixth Five Year Plan.

Fertilizers

The volume of fertilizer is usually measured in terms of "nutrient" tons. The principal forms of fertilizer nutrient are nitrogen (N), phosphate (P) and potassium (K). The production and consumption of fertilizer by nutrient are shown in Table 9 and Table 10. In 1980–81, the component ratio of total fertilizers is as follows;

	Production	Consumption
N	90.9%	76.0%
P	9.1%	23.2%
K		0.8%

During the past 10 years, almost fertilizers were imported because of moderate increasing production. Especially in the middle of 1970's the product level was almost constant. However, after the last of 1970's it was considerable changed in production

Table 9 Production of Fertilizers by Nutrient

(NOT/NOOO)

YEAR	NITROGEN (N)	PHOSPHATE (P)	POTASSIUM (K)	TOTAL	
			The Control of the State of the Control of the Cont		
4074 4070			**************************************		
1971-1972	215.1	4.9	0.0	220.0	
1972-1973	274.5	8.2	0.0	282.7	
1973-1974	300.1	4.2	0.0	304.3	
1974-1975	320.6	6.3	0.0	326.9	
1975-1976	314.9	11.8	0.0	326.7	
1976-1977	312.3	13.4	0.0	325.7	
1977-1978	312.8	15.0	0.0	327.8	
1978-1979	336.6	28.9	0.0	365.5	
1979-1980	389.9	51.5	0.0	441.4	
1980-1981	586.3	58.5	0.0	644.8	
		30.43	0.0	044.0	
1982-1983	732.3	63.3	0.0	705 4	
1987-1988	1137.7		* * *	795.6	
	4 1 4	98.9	0.0	1236.6	
1999-2000	2591.0	225.3	0.0	2816.3	

Table 10 Consumption of Fertilizers by Nutrient

	en e		(000N/TON)			
YEAR	NITROGEN (N)	PHOSPHATE (P)	POTASSIUM (K)	TOTAL		
			en de la companya de			
1971-1972	344.0	37.2	0.7	381.9		
1972-1973	386.4	48.7	1.4	436.5		
1973-1974	341.9	58.1	2.7	402.7		
1974-1975	362.9	60.5	2.1	425.5		
1975-1976	443.4	108.5	$\overline{1.9}$	553.8		
1976-1977	511.0	117.9	2.4	631.3		
1977-1978	554.1	157.3	5.8	717.2		
1978-1979	684.3	187.9	7.6	879.8		
1979-1980	806.0	228.5	9.6	1044.1		
1980-1981	819.6	250.4	9.0	1079.0		
			and the second			
1982-1983	897.2	299.1	11.7	1208.0		
1987-1988	1297.7	514.5	20.8	1833.0		
1999-2000	2461.3	1200.8	54.2	3716.3		

due to the starting operation in some new fertilizer plants, and it is expected that the increase of production from 1980-81 to 1987-88 and 1999-2000 will be about 1.9 times and 4.4 times respectively.

On the other hand, the increase of consumption from 1980-81 to 1987-88 and 1999-2000 has been also projected about 1.7 times and 3.3 times respectively.

Based on the projected production and consumption of fertilizer by nutrient, the resulting trade is shown in Table 11. Supply-demand of nitrogen fertilizer is expected to balance up to the year 1999–2000. The deficit for phosphate fertilizer will expand because of increasing consumption which is projected at a rate of 8.6% per annum up to the year 1999–2000. As for potassium fertilizer which is not produced in Pakistan, it is not so much volume at present but it will increase year by year.

With regard to raw materials like phosphate rock and sulpher which are required by phosphatic fertilizer plants, all of them are imported at present as shown in Table 12. However, it is anticipated that some of these raw materials will be provided by domestic production, and in future they will be imported a little over 50% of demand which is projected about 0.5 million tons in 1987–88 and 1.35 million tons in 1999–2000.

Other Dry Cargo

Import and export of other residual dry cargo are shown in Table 13 and Table 14 respectively. During the past 10 years, import of other dry cargo increased at a rate of 7.0% per annum as against levelling-out of export.

Based on relationship between population, GDP and other dry cargo, it is projected to increase at a rate of 4.0% per annum in import and 4.9% per annum in export from 1980-81 to 1999-2000. It is indicated that growth rate of import will declined and export will turn to increase because of rising domestic production with the development of industrialization.

Crude Oil & Petroleum Products

Supply-demand of crude oil and petroleum products are shown in Table 15 and Table 16 respectively. At present, crude oil & petroleum is imported about 90% of total consumption. Total consumption in the year 1999–2000 is projected to be 20.6 million tons growing at 6.6% per annum over the period. On the other hand, up to the year 1999–2000 total production is expected to be 2.4 million tons and it will be shortfall about 18.2 million tons.

With regard to petroleum products, Pakistan is surplus like naphtha and furnace oil, and these products are exported to Turkey, India and other countries. In 1980-81, export volume was about 1 million tons and export ratio to total products was 23.3%. Up to the year 1999-2000, total production is exported to be 12.5 million tons as against 8 million tons in consumption. As a result, petroleum products will be

Table 11 Projected Surplus/Deficit Conditions of Fertilizers by Nutrient

	11.					* *		
				w.witz		ary Tollyson		
	Number	lent ton	(1000N	/Tons)	Metr	ic ton(1	000M/TO	ons)
ing the second of the	1980	1982	1987	1999	1980	1982	1987	1999
rengan kalandari Marengan Manadari Kebada	81.	-83	-88	-2000	-81	-83	~88	-2000
nu saustann	645	795	1237	281.6	1605	1.940	3016	6869
Production N	586	732	1138	2591	1445	1767	2746	6253
D.	59	63	99	225	1.60	173	270	616
K			704. 5 .		्र कु न ्	1 / 1 / 1		
	1079	1208	1.833	3716	2878	3168	4209	8646
Consumption	820	897	1298	2461	2127	2263	3066	5971
N	250	299	51.5	1201	733	881	1101	2567
r r	.9	12	21	54	18	24	42	108
,		H AN EN						
Surplus(+)/			- 1 to 1				i i i i i i i i i i i i i i i i i i i	
Deficit(-)	0.3.4	. Transition in the contract of the contract o	-160	130	-682	-496	-320	282
N	-234	-165	-416	-976	-573	-708	-831	-1951
P.	-191 -9	-236 -12	-21	-54	-18	-24	-42	-108
K	-9	12	23				· 5'	
		100						

Table 12 Projection of Seaborne Trade
(Phosphate Rock/Sulpher)

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YEAR	PRODUCTION IMPORT CONSUMPTION PER CAPITA CONSUMPTION			
	(1000TON)	(1000TON)	(1000TON)	(KG)
1971-1972 1972-1973 1973-1974 1974-1975 1975-1976 1976-1977 1977-1978 1978-1979	0 0 0 0 0 0 0	19 45 0 11 34 26 58 136 176	19 45 0 11 34 26 58 136 176 191	0.30 0.69 0.0 0.16 0.47 0.35 0.76 1.73 2.17
1980-1981 1982-1983 1987-1988 1999-2000	250 570	299 278 779	299 528 1349	3.35 5.14 9.94

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Table 13 Projection of Seaborne Trade (Import Other Dry Cargo)

YEAR	IMPORT PER CAPI IMPOR	
	(1000TON)	(KG)
1971-1972 1972-1973 1973-1974 1974-1975 1975-1976 1976-1977 1977-1978 1978-1979 1979-1980 1980-1981	1063 887 1074 1109 1331 1601 1491 1516 1730 1959	16.7 13.6 15.9 16.0 18.6 21.4 19.5 19.3 21.3
1982-1983 1987-1988 1999-2000	2004 2621 4158	22.4 25.5 30.6

Table 14 Projection of Seaborne Trade (Export Other Dry Cargo)

YEAR	EXPORT	GDP	EXPORT/GDP
	(1000TON)	(1000TON)	(TON/ MILLION RP)
1971-1972	963	154120	6.2
1972-1973	851	165238	5.2
1973-1974	1003	178023	5.6
1974-1975	716	185031	3.9
1975-1976	850	191166	4.4
1976-1977	755	195994	3.9
1977-1978	728	210452	3.5
1978-1979	677	220250	3.1
1979-1980	773	235590	3.3
1980-1981	766	249038	3.1
1982-1983	831	279830	3.0
1987-1988	1049	395794	2.7
1999-2000	1884	844847	2.2

Table 15 Projection of Seaborne Trade (Crude Oil & Petroleum)

YEAR	PRODUCTION	IMPORT	CONSUMPTION PER CAPITA CONSUMPTION	
	(1000TON)	(1000TON)	(1000TON)	(KG)
1971-1972	409	3511		61.75
1972-1973	416	3585	4001	61.26
1973-1974	388	3947	4335	64.33
1974-1975	332	4011	4343	62.46
1975-1976	342	3694	4036	56.27
1976-1977	509	3744	4253	56.93
1977-1978	481	4697	5178	67.83
1978-1979	505	4990	5495	69.81
1979-1980	485	5535	6020	74.11
1980-1981	532	5598	6130	73.17
1982-1983	619	6264	6883	77.05
1987-1988	1057	8533	9590	93.44
1999-2000	2417	18146	20563	151.47

Table 16 Projection of Seaborne Trade (Petroleum Products)

YEAR PRODUCTION EXPORT CONSUMPTION PER CA CONSUMP	TION
(1000TON) (1000TON)	(KG)
1971-1972 3246 628 2618 4	1.24
1972-1973 3263 708 2555 3	9.12
1973-1974 3227 644 2583 3	8.33
1974-1975 3078 306 2772 3	9.87
1975-1976 2963 376 2587 3	6.07
1976-1977 3064 505 2559 3	4.26
1977-1978 3851 783 3068 4	0.19
1978-1979 3782 881 2901 3	6.85
1979-1980 4266 1091 3175 3	9.09
1980-1981 4259 994 3265 3	8 97
1982-1983 4688 1222 3466 3	8.80
	2.96
1999-2000 12499 4436 8063 5	9.39

exported about 4.4 million tons and export ratio to total production will be up to 35.5% over the period.

Other Liquid Cargo

Table 17 shows the supply-demand of edible oil. During the past 10 years, both of production and consumption steadily increased at a rate of 13.5% per annum and 18.6% per annum respectively. At present, import ratio to total consumption is over 50%. In absolute terms, domestic production is 5 million tons and consumption is 11.1 million tons in 1980-81. However, up to the year 1999-2000 production is expected to increase at a rate of 8.5% per annum as against 5.3% per annum in consumption. As a result, import volume will be remain almost constant at a level of a little over 6 million tons.

With regard to molasses, total production is not known, it is therefore projected directly for export volume which is shown in Table 18 based on the relation to sugarcane production. The resulting trade of molasses will increase from 265 thousand tons in 1980–81 to 406 thousand tons in 1987–88, 577 thousand tons in 1999–2000.

Table 17 Projection of Seaborne Trade (Edible Oil & Tallow)

YEAR	PRODUCTION	IMPORT	CONSUMPTION	PER CAPITA
	(1000TON)	(1000TON)	(1000TON)	(KG)
1971-1972	162	77	239	3.76
1972-1973	182	67	249	3.81
1973-1974	225	162	387	5.74
1974-1975	272	196	468	6.73
1975-1976	277	268	545	7.60
1976-1977	326	345	671	8.98
1977-1978	360	291	651	8.53
1978-1979	422	458	880	11.18
1979-1980	452	511	963	11.86
1980-1981	505	608	1113	13.28
				all and the state of the
1982-1983	551	632	1183	13.24
1987-1988	979	685	1664	16.21
1999-2000	2364	636	3000	22.10
	1			

Table 18 Projection of Seaborne Trade (Molasses)

YEAR	EXPORT PER CAPITA EXPORT
	(1000TON) (KG)
1971-1972	185 2.9
1972-1973	96 1.5
1972-1973 1973-1974 1974-1975	124 1.8 111 1.6
1975-1976	127 1.8
1976-1977	169 2.3
1977-1978	421 5.5
1978-1979	416 5.3
1979-1980	212 2.6
1980-1981	265 3.2
1982-1983	302
1987-1988	406 4.0
1999-2000	577 4.3

III. MICROSCOPIC TRAFFIC DEMAND

Introduction

- 1. Present Road Traffic Estimates
 - 1-1 Methodology
 - 1-2 Results.
 - 1-3 Cross Check
- 2. Present Land Traffic Estimates
 - 2-1 Methodology
 - 2-2 Results
- 3. Present Sea Traffic Estimates
- 4. Present Air Traffic Analysis
 - 4-1 Preparation for the Traffic Data
 - 4-2 Passenger
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- 5. Future Desire Lines
- 6. Land Traffic Comparison
- 7. Appendix: Comprehensive OD Tables

III. MICROSCOPIC TRAFFIC DEMAND

Introduction

This report will complement the chapter of Microscopic Traffic Demand Forecasting in the main text.

It will include the subjects, mainly concerned with the present traffic estimates, because so many basic traffic data had been found to be lacking. Present traffic situation will be also analyzed. Future desire lines and the results of land traffic comparison with Thailand will be shown.

Comprehensive OD tables will be displayed in the Annex.

1. Present Road Traffic Estimates

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1-1 Methodology

It is to be mentioned that there is no regular and reliable sources of information on road traffic which is indispensable together with that on railways for the comprehensive transport plan.

It is recommended that the regular survey on road traffic should be carried out and kept as the statistics for such purposes.

The relevant data available for estimation of road traffic volumes are (1) Traffic counts, (2) Number of vehicle on road, and (3) Fuel consumption.

In this study, estimation by traffic counts was adopted and processed, and the results were cross checked with reference to data (2) and (3).

The data applied in this study are the average daily traffic with six vehicle categories assembled by the four provinces on the traffic counts of the 350 survey stations out of total 500 complied by the Punjab Highway Department for the period of 1975-80.

Because of the reason that there are very few stations conducting successive observation for this period except Punjab, and therefore, interpolation and extrapolation have been applied to traffic counts estimate for those stations lacing of observation.

The average daily number of vehicles at each station was multiplied by the length of respective road sections and estimates of vehicle kilometers were prepared which were then multiplied by the load factor observed in Road OD Survey (NTRC, 1979–80).

1-2 Results

The results of estimation for vehicle kilometers, passenger kilometers and ton kilometers are shown in Table 1-1. It is pointed out that the increase in ton kilometers is larger (annual growth rate = 12%) and the increase in passenger kilometers is smaller (annual growth rate = 6%) compared with those derived by projection for 1975-80 shown on Fifth Five Year Plan.

1-3 Cross Check

POL consumption for transport sector is shown in Table 1-2. M.S. and H.O.B.C. are consumed mainly by motor cars and H.S.D. is by buses and trucks.

Assuming average fuel consumption of 10 miles/gallon (3.5km/l) for buses and trucks, the total H.S.D. that would be required for the estimated vehicle kilometers are 677 (1066) thousand tons in 1975 (1980). It is 75(71)% of total H.S.D. available for road vehicles in 1975 (1980). The balance may be accounted for urban transport, and other than buses and trucks. The annual growth rate of vehicle kilometers for motor cars is 13% for the period of 1975–1980, compatible with 11% of the growth rate of M.S. consumption. The vehicle kilometers estimated by traffic count data is at large corresponding to fuel consumption.

The average annual kilometers obtained from traffic count data by dividing the vehicle kilometers by the numbers of vehicles on road are 16, 63 and 96 thousand kilometers for motor cars/wagons, buses and trucks, which can be regarded as reasonable.

2. Present Land Traffic Estimates

2-1 Methodology

(1) Road OD

NTRC had carried out the Road OD Survey, which is noted as below:

	Period	Number of stations	Observation hours	Number of vehicles, interviewed
Round-I	11 1.070		24	110,751
Round-II	Арг. 1980— Nov. 1980		24	

The above data was processed to construct vehicle OD tables, commodity OD tables and passenger OD tables, as follows:

- (1) Modification with sampling rate by station.
- (2) Selections of stations relevant to each zones.
- (3) Conversion to weight unit from cubic feet, number and gallons for some commodities.
- (4) Re-categorization of commodity and passenger.
- (5) Average for Round-I and Round-II.

Table 1-1 Road Transport Volume

		1				•	
		1975	1976	1977	1978	1979	1980
Mateu Can Wagan	Vehicle km/day ('000')	3,351	3,619	4,082	4,815	5,482	6,084
Motor Car Wagon	Passenger km/year (million)		7,556	8,522	10,053	11,445	12,702
D	Vehicle km/day ('000')	3,018	3,155	3,293	3,366	3,539	3,803
Bus	Passenger km/year (million)		44,209	46,143	47,166	49,590	53,289
Motor Car & Bus	Passenger km/year (million)		51,765	54,665	57,219	61,035	65,991
Truck	Vehicle km/day ('000')	4,981	5,517	5,942	7,189	8,241	8,782
	Ton km/year (million)		11,438	12,319	14,904	17,085	18,207

Note:

Load Factor —

1) Motor Car/Wagon 5.72 Passengers/Vehicle

2) Bus

38.39 Passengers/Vehicle

3) Truck

5.68 Tons/Vehicle

Source: Study Team Estimates based upon Traffic Count Data.

Table 1-2 Pol Consumption (Transport Sector)

Product/Year	1971-72	1972-73	1973-74	1974 - 75	1975-76	1976-77	1977-78	1978-79	1979 -80
			100						
Aviation Fuels	188,547	155,527	190,161	217,328	240,367	259,851	290,293	334,676	345,694
H.S	261,208	256,506	249,343	268,826	278,466	289,757	343,506	390,761	426,271
н.о.в.с	53,185	58,251	59,888	66 158	74 ,452	84,186	101,455	114,712	1 15,983
H.S.D.	582,733	570,800	721,672	821,651	899,547	933,973	1,101,884	1,325,732	1,497,736
t.p.o	2,341	7,403	4,429	3,523	4,876	6,400	12,194	6,796	3,745
F.0	28,188	34,487	33,201	39,263	38,738	42,872	58,508	50,919	51,202
TOTAL:	1,116,175	1, 182, 974	1,258,694	1,416,749	1,536,446	1,617,039	1.907.840	2,223,596	2,440,631

Source: N.T.R.C.

Note:

M.S.

Motor Spirit

H.O.B.C. H.S.D.

High Octane Benzine Co.

L,D.O.

High Speed Diesel (including tractor)
Low Diesel Oil

F.O.

Furnace Oil

The results of Road OD Survey are summarized in Table 2-1 and Table 2-2, which show the load carried, number of vehicles and average load for commodity and passenger, respectively.

Average Load Factor for Road OD Survey

(Tone/Day) Average Round-I Round-II Average load No. of vehicles Type of commodity Load No. of Load Average Load Average vehicles carried carried vehicles load 3,580 3,505 343 10.22 3,654 360 10.15 352 10.17 1. Wheat 2,799 12.78 6,023 589 10.23 2. Rice 9,247 959 9.64 219 7.37 714 4,137 540 7.66 4,624 627 3. Cotton 5,110 7.16 8.35 1,253 150 4. Edible Oil 853 108 7.90 1,652 192 8.60 715 907 97 9.35 1,099 122 9.01 72 9.93 5. Sugar 457 6. Cement 4,898 440 11.13 5,244 474 11.06 5,071 11.10 7. Fertilizer 4,396 484 9.08 4,666 403 11.58 4,531 444 10.20 2,088 251 8.32 8. Iron & Steel 2,215 269 8.23 1,960 232 8.45 32,635 3,457 9.44 31,048 3,364 9.23 34,221 3,550 9.64 Mining 9. 9.84 7,040 711 7,393 751 Coal & Coke 7,745 790 9.80 9.90 10. 8.06 8.51 9,065 1.018 8.90 8,017 942 6,968 865 11. Petroleum 1,981 237 8.36 Firewood 1,890 221 8.55 2,072 252 8.22 12. 2,463 325 7.58 1,982 245 8.09 Sugar Cane 2,944 404 7.29 13. 10,401 1,287 8.08 Fruits & Vegetables 9,661 1,214 7.96 11,140 1,359 8.20 750 2.33 2,166 807 2.68 1,322 693 1.91 1,744 Live Stock 15. Others 37,172 4,829 7.70 30,690 4,064 7.55 33,931 4,447 7.63 16. 130,903 15,933 8.22 122,380 14,385 8.51 126,642 15,159 8.35 17. Sum (Loaded)

Source: JICA Study Team Estimation from Road OD Surveys.

180,903

18. Empty

19. Sum

Table 2-2 Average Passenger Loads for Road OD Survey

11,128

27,061

		Round-I			Round-II			Average	24.7
Type of vehicle	No. of pas- sengers	No. of vehicles	Average pas- sengers	No. of pas- sengers	No. of vehicles	Average pas- sengers	No. of pas- sengers	No. of vehicles	Average pas- sengers
Bus	558,271	14,503	38.49	605,112	15,803	38.29	581,692	15,153	38.39
Mini Bus/Wagon	41,425	3,491	11.87	53,044	4,443	11.94	47,235	3,967	11.91
Car/Jeep/Taxi	57,659	14,752	3.91	56,831	13,875	4.10	57,245	14,314	4.00
Sum	657,335	32,746		714,967	34,120	,	686,151	33,433	

4.84 122,380

11,161

25,546

11,145

26,304

126,642

٠.

4.81

Source: JICA Study Team Estimation from Road OD Surveys.

Average passengers for car seem to be high. This is partly because of misclassification of vehicle, and average passengers become 3.21, if misclassification were corrected.

Road OD tables were cross-checked from the viewpoint of national total of road traffic volume, as the following.

Vehicle OD, Commodity OD and Passenger OD tables were multiplied by distances between zones, which was calculated with minimum time path method and were compared with the national totals for road traffic shown in previous section.

Table 2-3 Road Traffic Volumes

		Based 1) on traffic counts	Based 2) on OD Tables	Ratio 2)/1) × 100 (%)
Motor Car Wagon	Vehicle Km/day ('000')	6084	3118*	51
	Passenger Km/year (Million)	12702	6082	48
Bus	Vehicle Km/day ('000')	3803	2262	59
	Passenger Km/year (Million)	53289	31635	59
Motor Car & Bus	Vehicle Km/day ('000')	9887	5380	54
	Passenger Km/year (Million)	65991	37717	57
Truck	Vehicle Km/day ('000')	8782	7114	81
	Ton Km/year (Million)	18207	16462	90

^{*} Including pick-up/vans.

It is found that results of OD tables are less than the results of traffic counts. This is because the Road OD Surveys were carried out on the boundary of districts and do not include the intra-district traffics. This phenomenon is distinct, particularly for passengers, and it might be necessary to add the intra-district traffics in the stage of the traffic assignment for road planning.

(2) Railway OD

Railway commodity OD between stations are available by month (see Table 2-4). The seasonal fluctuation is large for the agricultural products, and July '80 and January '81 were selected as typical months.

The data on commodity OD were processed to construct commodity OD tables, as the following:

Table 2-4 Railway Commodity Carried by Month

(Unit in '000' QfLs = 100 ton) Commodity Total

1. Coal Coke, Fuel 3,300
2. RoL (B) 8,724
3. Furnace Oil 1,885
4. Firewood 3,252
5. Faddy, Rice 5,395
6. Other Ralns 105
7. Oil Seeds 24
8. Mheat 8,091
10. Oypsum 325
11. Ballast 552
12. Salt - Roch 2,599
13. Sugar 1,541
14. Tieber 181
15. Hetallic Ores 117
16. Hides, Skins 90
17. Cotton Raw: 938
18. FOL (C) 3,783
20. Cement 6,899
21. Cotton 100
22. Fruits, Vegetable 25. Jagree 26
25. Jagree 26
26. Fertilizers, Phosp 10,713
phate.
27. Just Steel (A) 240
28. Iron Steel (B) 31
30. Iron Steel (B) 31
31. Hachinery (General) 146
32. Hachinery (General) 146
33. Tobacco (trical) Oct.80 Nov.80 Dec.80 Jan;81 Feb;81 Har;81 Apr;81 191 159 201 349 75 230 26 63 15 71 40 291 758 66 648 1 83 568 1 71 0 998 1,426 1,147 547 1,429 95<mark>6</mark> 1,132 12 20 2 12 3 0 0 10 2 33. Tobacco (trical
34. Edible Olls (D)
55. Sugarcene
36. Miscellaneous
Commodities
57. Military Traffic
38. Livestock.
39. Coal, Coke for
Railway. \mathbf{n} 168 5,372 21 361 9 1 17 19 18 3 4 40. Other revenue storage.
41. Railway materials 42. Coal, Coke for foreign railway 43. Capital Ballast 44. Revenue Ballast 45. Imprest stores 46. Motor Cars, Tractors.
47. Electric Fans, Ty Sets etc.
48. Salt NOC _4 810 185 1 47. Electric Pans,
TV Sets etc.
48. galt MCC
49. Rock Phosphate
51. Military 011
52. Military Wheat
53. Oll Cake
54. Vegetable 011
55. Other Military 2
57. Iron Scraps
59. 118 71 108 7 138 111 249 34 119 24 93 117 3 _2 520 575 535 59, H.S.D.011 for Loco 60, 011 Fuel for Loco. 8,974 10,677 9,502 9,319 9,851

Source: Pakistan Railways

- (1) Conversion from stations to zones.
- (2) Commodity re-categorization.
- (3) Addition of July'80 and January '81 data and adjustment to annual volume for 1980/81 by commodity.

Railway passenger OD tables are not available now, and necessary to be estimated.

The station-wise data for number of passengers by classes (1975/76) were processed, together with the number of tickets sold by destination at the major stations (Karachi City, Lahore, Faisalabad, Rawalpindi, Peshawar, Quetta) in January, 1981 as the following:

- (1) Conversion from stations to zones.
- (2) Passenger re-categorization.
- (3) Adjustment to the passengers-carried in Pakistan Railway Year Book for 1980/81.
- (4) Distribution with the tickets data and with assumption.
- (5) Convergence with Fratar method.

The estimation results were cross checked in terms of passenger km and distribution by distance, which are compiled by Pakistan Railways.

Table 2-5 Comparison between Actual and Estimation for Railway Passenger

	Lower	class	Upper class		
	Actual	Estimation	Actual	Estimation	
Passenger km (Million)	15,824	15,883	487	457	
Passenger ('000')	122,600(100)	122,600(100)	602(100)	602(100)	
0-100 kg (%)	92,370 (75)	91,438 (75)	9 (2)	18 (3)	
100-500 km (%)	20,444 (17)	23,126 (19)	212 (35)	233 (39)	
500 km- (%)	9,786 (8)	8,036 (6)	381 (63)	351 (58)	

Source: Actual (Pakistan Railways)

Estimation (JICA Study Team, base on OD tables)

It was found that the estimation results are quite consistent with the actual one, as shown in Table 2-5.

2-2 Results

(1) Passenger

Present passenger traffic estimates are summarized in Table 2-6, where both traffics excluding and including the intra-zonal traffic are shown. This study is, mainly, focused on the inter-zonal traffics and the intra-zonal traffics are neglected in general.

Fig. 2-1 and Fig. 2-2 show the modal split by distance, and desire lines for road and rail, respectively. It is clearly seen that road carries the shorter distance trips and rail carries the longer distance trips.

(2) Commodity

Present commodity traffic estimates are summarized in Table 2-7, where both traffics excluding and including the intra-zonal traffic are shown. Different from the passenger traffic, the portion of the intra-zonal traffic is small.

Table 2-6 Present Passenger Traffic Estimates

			Sum	Lower class	Upper class
		Sum	281,251(100.0)	246,896(100.0)	34,356(100.0)
Passenger ('000')	I	Road	227,737(81.0)	193,977(78.6)	33,761(98.3)
		Rail	53,514(19.0)	52,918(21.4)	596(1.7)
		Sum	51,539(100.0)	46,018(100.0)	5,522(100.0)
general Ma Talah	I	Road	36,590(71.0)	31,525(68.5)	5,064(91.7)
		Rail	14,950(29.0)	14,492(31.5)	457(8.3)
Passenger• km -					
(million)		Sum	82,302(100.0)	69,113(100.0)	13,189(100.0)
	II	Road	65,991(80.2)	53,289(77.1)	12,702(96.3)
		Rail	16,311(19.8)	15,824(22.9)	487(3.7)
	-				

Note: I (Based on OD tables, excluding intra-zonal traffic)
II (Including intra-zonal traffic)

Source: JICA Study Team estimation

Fig. 2-1 Passenger Share between Road and Railway by Distance

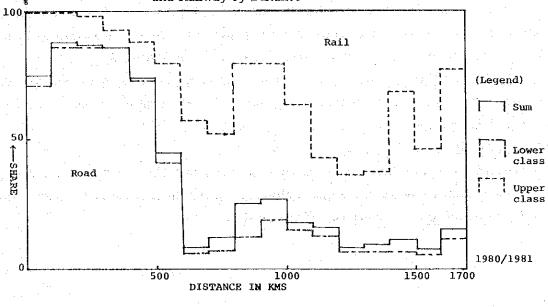


Fig. 2-2 Desire Lines for Passenger

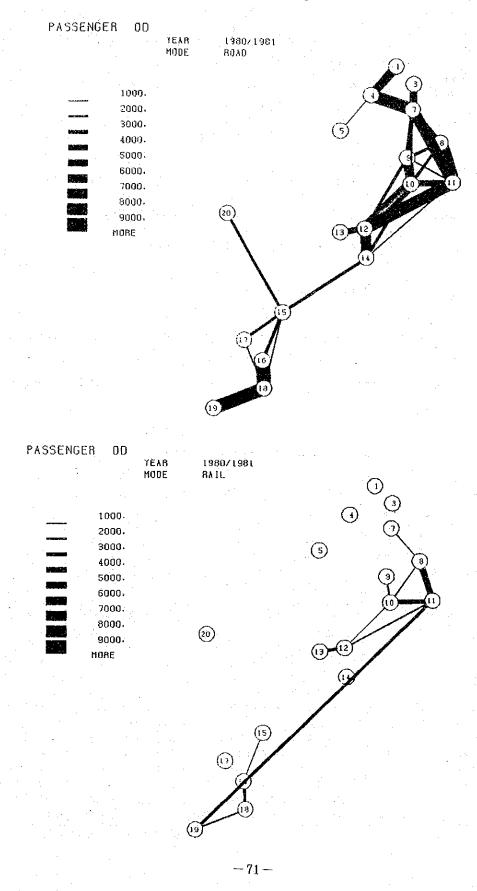


Table 2-7 Present Commodity Traffic Estimates

		I	II
	Sum	53,986(100.0)	
Ton ('000')	Road	43,583 (80.7)	·
(000)	Rail	10,403 (19.3)	
	Sum	24,561(100.0)	26,125(100.0)
Ton km (million)	Road	16,514 (67.2)	18,207 (69.7)
(IIIIIIOII)	Rail	8,047 (32.8)	7,918 (30.3)

Note: I (Based on OD tables, excluding intra-zonal traffic)

II (Including intra-zonal traffic)

As for railway, the difference between I and II comes from

statistical reason.

Source: JICA Study Team estimation

Table 2-8 shows the modal split between road and railway by commodity. In terms of ton km, railway carries more than road for wheat, sugar, cement, fertilizer, petroleum and rock phosphate. Major commodities for road are mining, fruits & vegetables and general cargos.

Table 2-8 Modal Split by Commodity

(1980 / 1981)

Commodity	т	on ('000')	: :		Ton km (million	1)
	Sum	Road	Rail	Sum	Road	Rail
1 WHEAT	2,014	1,227 (60,9)	738 (59.1)	796	320 (40.2)	476 (59.8)
2 RICE	2,684	2,146 (80.0)	538 (20.0)	1,701	1,162 (68.3)	540 (31.7)
3 COTTON	1,749	1,655 (94.6)	94 (5.4)	697	618 (88.7)	79 (11.3)
4 EDIBLE OIL	617	455 (73.7)	162 (26.3)	411	224 (54.6)	187 (45.4)
5 SUGAR	450	309 (68.6)	142 (31.4)	216	54 (29.1)	162 (74.9)
6 CEMENT	2,585	1,819 (70.4)	766 (29.6)	1,056	514 (48.7)	542 (51.3)
7 FERTILIZER	2,702	1,622 (60.0)	1,079 (40.0)	1,751	830 (47.4)	922 (52.6)
8 IRON & STEEL	781	747 (95-7)	33 (4.3)	466	421 (90.4)	45 (9.6)
9 MINING	10,851	10,480 (96.6)	371 (3.4)	2,225	2,072 (93.1)	153 (6.9)
10 COAL & COKE	2,872	2,512 (87.5)	360 (12.5)	1,897	1,514 (79.8)	383 (20.2)
11 PETROLEUM	4,608	2,918 (63.3)	1,691 (36.7)	2,914	1,006 (34.5)	1,908 (65.5)
12 FIREWOOD	1,013	664 (65.5)	349 (34.5)	288 .	167 (57.8)	122 (42.2)
13 SUGAR CANE	805	805(100.0)	0 (0.0)	161	161(100.0)	0 . (-0.0)
14 FRUITS & VEGETABLE	3,635	3,635(100.0)	0 (0.0)	1,997	1,997(100.0)	0 (0.0)
15 LIVESTOCK	.624	624(100.0)	0 (0.0)	177	177(100.0)	0 (0.0)
16 ROCK PHOSPHATE	148	0 (0.0)	148(100.0)	146	0 (0.0)	146 (100.0)
17 RAILWAY MATERIAL	1,415	0 (0.0)	1,415(100.0)	398	0 (0.0)	398 (100.0)
18 RAILWAY OIL	654	0 (0.0)	654(100.0)	470	0 (0.0)	470 (100.0)
19 OTHERS	13,779	11,965 (86.8)	1,814 (13.2)	6,795	5,278 (77.7)	1,516 (22.3)
20 SUM	53,986	43,583 (80.7)	10,403 (19.3)	24,561	16,514 (67.2)	8,047 (32.8)

Source: JICA Study Team estimation

Fig. 2-3 and Fig. 2-4 show the modal split by distance, and desire lines for road and railway, respectively. It is clearly seen that railway carries the longer distance commodities than road. However, it should be noted that road carries more than half at any distance, if summing up all commodities. It is, therefore, suggested that the long distance commodities should be converted to railway, from the viewpoint of transport cost. It is, also, seen that the flow from down-country to up-country dominates, and this might prevent the efficient transport.

(3) Vehicle OD

Desire lines for vehicle OD are shown in Fig. 2-5 in the passenger car unit (PCU), where one bus or truck corresponds to three cars. It is clearly seen that the longer distance trips are dominated by trucks.

3. Present Sea Traffic Estimates

It is necessary for planning of shipping to grasp the transport volume by commodity and by area, what is called trade matrix. However, present trade matrix is not available in Pakistan. It is, therefore, necessary to estimate the present trade matrix with the relevant data.

	Area j	Σ j
Commodity i	Trade Matrix	Trade by Commodity
Σ i	Trade by Area	

Sea-borne trade at Karachi Port (KPT statistics) gives "Trade by Commodity", and Pakistan's foreign trade by area/country (Port & Shipping Wing) gives "Trade by Area". Some information for trade matrix is obtained from Foreign Trade Statistics (Statistics Division).

Present Trade Matrix was estimated by processing these data as shown in Fig. 3-1. Trade 3-1 shows the estimation result of present trade matrix.

| FERTILIZER SUM (regend) 1500 Commodity Share between Road and Railway by Distance Rail 1000 DISTANCE IN KMS Fig. 2-3 500 SHARE 20

Fig. 2-4 Desire Lines for Commodity

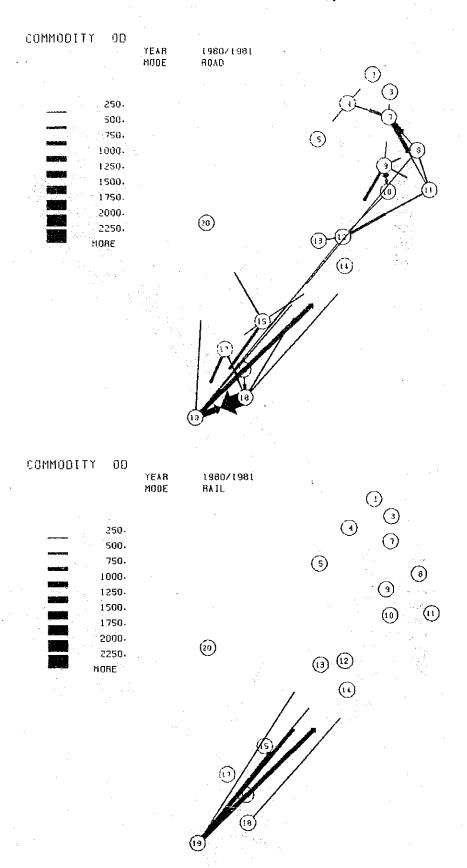


Fig. 2-5(1) Desire Lines for Vehicle

1980/1981

SUM

YEAR

VEH1CLE

VEHICLE OD

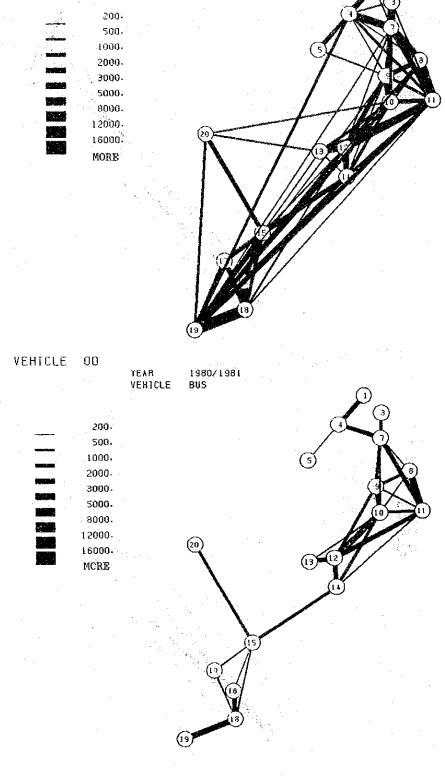


Fig. 2-5(2) Desire Lines for Vehicle

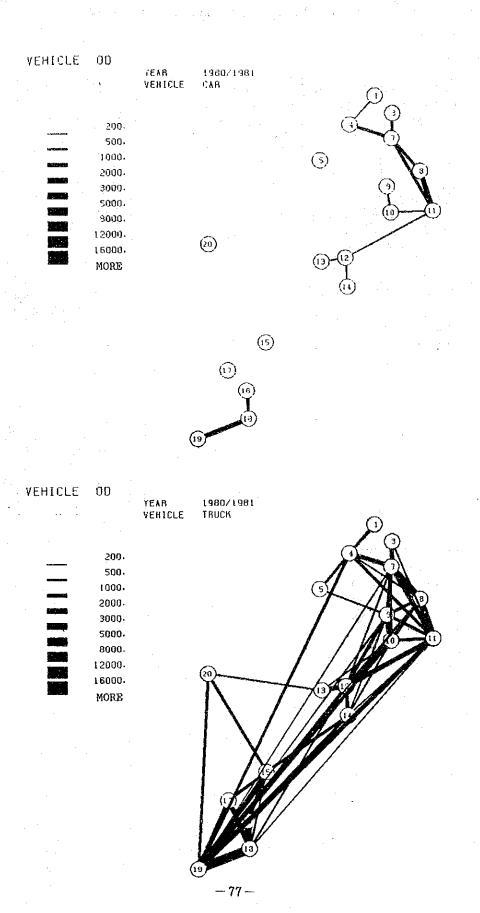


Fig. 3-1 Estimation Flow for Trade Matrix

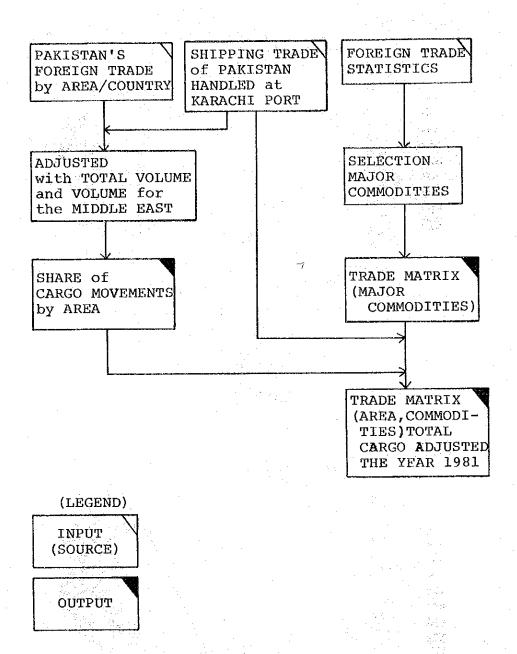


Table 3-1 Pakistan's Cargo Movement by Area and Type of Cargo

Import 1980 / 1981

	1 Europe	2 Asia	J Middle East	4 Africa	5 South America	6 North	7 Oceania	(Total)
1. Wheat	82.	0.	0.	0.	0.	191.	34.	308
2. Cement	350.	90.	4.	0.	0.	0	0.	444
3. Fertilizers	601.	8.	370.	0.	0,	506.	0.	1485.
4. Rice	0.	0.	0.	0	0.	0.	0.	0.
5. Coal & Ores	87.	49.	77.	25 .	24 .	88.	56.	405.
6. Petrols	57.	44.	5494.	0.	0.	3.	0.	5598.
7. Molasses	0.	0.	0.	0.	0.	0.	0.	0.
8. Edible & Tallo	w 34.	255.	2.	0.	85.	232.	0.	608.
9. Cotton	0.	0.	0.	0.	0.	. 0.	0.	0.
10. Others	862.	1388.	14,	58.	45.	11.	97.	2475.
(Total)	2072.	1834.	5960,	83.	154	1032.	188.	11323.

Export 1980 / 1981

	1 Europe	2 Asia	3 Middle Bast	4 Africa	5 South America	6 North	7 Oceania	(Total)
1. Wheat	0.	0.	0.	0.	0.	0.	0.	0.
2. Cement	0.	0.	0.	0.	0.	0.	0.	0.
3. Fertilizers	9.	5.	7.	-0.	· 0.	0.	0.	21.
4. Rice	25.	103.	428.	545.	155,	· f.	0.	1257
5. Coal & Ores	0.	0.	0,	0.	0.	0.	0.	0.
6. Petrols	0.	477.	447.	0.	19.	0.	51.	994.
7, Holasses	261.	3.	1.	0.	0.	0.	0.	265.
8. Edible & Tallo	w 0.	0.	0.	0.	0.	0.	0.	0.
9. Cotten	10.	304.	í.	0.	1.	0.	0.	315.
10. Others	254	52.	298.	0.	1.	162.	0.	767.
(Total)	558.	945.	1182.	545.	175.	163.	51.	3618.