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**SOCIO-ECONOMIC IMPACT OF
MOTORWAY(M-2)**

NTRC-231

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FEBRUARY, 2001

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EXECUTIVE SUMMARY

One of the main objectives of the Lahore-Islamabad Motorway (M-2) was the socio-economic development of the area through which it passes. The facility was opened to traffic in November, 1997. The study attempts to quantify the impact upto September, 2000 i.e. after three years of the opening of the Motorway.

A sample of 44 villages was selected on random basis from 180 villages, in the areas within 8 Kms on both sides of the Motorway. In aggregate 200 persons from the villages were interviewed concerning the advantages or otherwise of the Motorway accrued to them in terms of access to health, education, business and other socio-economic services.

The results of the study are as follows:-

- (a) **Health:** Only 7% indicated that access to health facilities has improved, 13.2% were of the view that they are facing more difficulties in reaching the hospitals/health units, while 80% felt no change.
- (b) **Education:** Only 3% were of the opinion that access to secondary and college education has become easy. 12% faced more difficulty, while 85% felt no change.

(c) **Transport:** 35% of the respondents believed that transport facilities have improved, 14% felt adverse impact while 51% reported no change.

(d) **Business and Industry:** Only 4% of the respondents opined that time and distance in reaching their work places has decreased. 14% complained that travel time as well as travel distance has increased. 82% felt no change.

(e) **Traffic Analysis**

The average daily traffic (both directions) in November, 1997 was 3,600 vehicles per day(vpd), which increased to 4,300 vpd in September, 2000. Private passenger vehicles have increased more rapidly than the public service vehicles. Traffic in respect of goods vehicles has shown a declining trend.

(f) **Utilization:** The minimum capacity of the M-2 is at least 75,000 vehicles per day, therefore with the current level of traffic, the capacity utilization is only 5.7%. Assuming a traffic growth rate of 6%, it would take nearly 50 years before the available capacity would be utilized. In contrast the design life of the present pavement is less than 20 years.

2. The land owners and others involved in agriculture from the villages surveyed, had the following views:-

- i) More than 8,000 acres of fertile agricultural land has been divided due to the un-natural barrier of motorway.
- ii) More than 45% of the population is facing difficulties in transportation of their produce.
- iii) About 40 - 45% feel they have been deprived of their own women labour force.
- iv) 11.6% are facing irrigation problems.
- v) 25.6% complained that under-passes are narrow and prone to flooding.

Conclusions

The analysis of the study reveals that Motorway (M-2) has very little positive impact on the life of the people around the motorway. Rather, more difficulties have been caused in access to various facilities, such as, Health, Education, Business and Industry.

IMPACT OF MOTORWAY(M-2) ON THE SOCIO-ECONOMIC DEVELOPMENT OF THE AREA

1. Introduction

The need for transport cannot be denied but it cannot be over-emphasized. In fact, our existence and the existence of civilization depends largely upon transport. Transport is one of the most important ingredients for social and economic development of the areas. Without mobility, progress is not possible. Thus there is a need of a strategy for increasing mobility in developing an efficient transport system. Jammed wheels or absence of access roads do not permit transport of goods and services.

An efficient transport system favourably affects the social and economic aspects of a country. It helps the growth of improved health, education, trade and industry.

Among the transport infrastructures, roads are the most important of all, as roads play a significant role in the development of nations all over the globe. In Pakistan too, efforts have been made to have a network of primary, secondary and tertiary roads, spread over the country to connect the villages & the small towns to the big cities, but the most important and the ambitious projects of them is the Motorway Project, which aims at providing a modern high speed facility in the country. It provides a completely un-interrupted flow of traffic allowing

limited access and exits only at the interchanges designed for this purpose. Except at ramps, it has been completely fenced on both sides. The design speed of the motorway varies according to the terrain which is 120 km/hour in plain areas (0 km - 200 km), 50 km/hour in Salt Range hilly area (206 to 213 km). Beyond Km 213 upto end point of M-2, the terrain is rolling and hilly, speed varies according to ground profile and horizontal geometry however average speed on this section is 100 km/hour.

Lahore-Islamabad (M-2) is 334 Kms long. The (M-2) Motorway starting from Lahore enters the most agricultural and plain areas of Sheikhpura/Gujranwala and Sargodha Districts and then passes through the mixture of a moderate agricultural, barren mountainous Salt Range and hilly tracks of Jhelum, Chakwal and Rawalpindi Districts. It comprises 4 major river bridges, 4 overhead railway bridges, 31 bridges over canals and distributaries, 15 bridges over flood waterways, 35 box culverts over canals and drains, 153 culverts over channels, 64 under passes, 61 cattle creeps, 8 interchanges and 22 fly overs. Services such as Mosque and Restaurant, Police Post, Petrol Pumps/Service Stations/Workshops, wash rooms, first aid emergency centres and pay phones are in the process of construction.

2. Impact Zone

The Impact zone may be defined as the area within 8 kms on either side of the motorway. There may be hundreds of villages on both sides of the interchanges joining the motorway.

3. Physical Characteristics

The physical features of the areas around Motorway which passes through the districts of Rawalpindi, Chakwal, Sargodha, Faisalabad, Sheikhupura and Lahore exhibit a variety which is continental in dimensions. Among these features one can find mountains, green valleys, rivers including Salt Range, streams, plains and several other forms of topography. The areas of Rawalpindi and Chakwal on both sides of the motorway is mostly Barani and depends upon rain fall. The physical terrain of these areas does not permit irrigation by canals. However, the land falling in the districts of Sargodha, Faisalabad, Sheikhupura and Lahore is irrigated by canals and tubewell, and exhibit ideal characteristics for agriculture; wheat, rice, sugarcane and citrus fruits are the main produces of these areas.

4. Methodology

4.1. Selection of the Sample Units

A sample of 44 villages was selected on Simple Random Sampling basis from 180 villages in the areas within 8 kms on both sides of the motorway. Villages within the impact zone that is, within 8 kms on either side of motorway were selected in such a way that their distance from the motorway as well from the access road leading to the motorway was not more than 8 kms.

The table below shows the distance of sampled villages from Motorway fence and the nearest interchange.

Table-1
Distance of Villages from Motorway fence and the nearest interchange

Distance (Km)	No of Villages (%age)					Total
	0-1	2-5	6-10	10-15	15 >	
Motorway Fence	128	45	7	-	-	180
(%age)	(71.2)	(25.2)	(3.6)	-	-	100
Nearest Interchange	25	57	78	12	8	180
(%age)	(13.9)	(31.5)	(43.5)	(6.5)	(4.6)	100

5. Collection of Data

A sample of about 44 villages was drawn from the peripheral areas on either side of the motorway. The selection of sample was made keeping in view that the selected villages which are within the impact zone represent the zero

kilometer to the maximum of 8 kms from the motorway fence. The information was collected on the questionnaire (Annexure-I). Three to four questionnaires were filled from each village by interviewing people of various professions. In some cases more people were involved in filling up the questionnaires. In aggregate more than 114 questionnaires were filled and the persons were asked questions about the advantages or otherwise of the motorway in access to health, education, business, manufactures, transport and communications, land acquisition and other socio-economic implications during four to five weeks field work.

6. Impacts on various socio-economic sectors

In this part of the Study, analysis of collected data indicates the changes or otherwise caused by the Motorway in the fields of education, health, industries, land use, land acquisition and others. The analysis is based very largely on the field investigation data.

6.1 Health Services

In rural areas of the Punjab, availability of health facilities can be seen from the following:

Health Facilities (1998)

- Hospitals	24
- Rural Health Centre	287
- Maternity & Child Health Centres.	90
- Dispensaries	977
- Sub-Health Centre	574
- Basic Health Units	2400

Source: Ministry of Health

According to the source (Ministry of Health), there is a Rural Health Centre/Hospital for every 10,000 population and one Basic Health Unit for every 5,000 population. Visits to the health services were not the instruments of the survey, however, some of Rural Health Centres/Basic Health Units situated on both sides of the Motorway (M-2) were visited. Unlike the elementary schools, health services were housed in proper buildings, but in none of these hospitals, a qualified medical doctor was available.

Travelling to certain point involves two very important things i.e. the distance and the accessibility. Here distance does not need any clarification, however accessibility may loosely be defined as "ease of participating in activities and is basically related to people's ability to reach the things which are important to them (Moseley, 1979)". The accessibility is dependent upon parameters such as type of transport and infrastructure available. In practice "accessibility is related to the ability of transportation system to provide a low cost and quick method of overcoming the distance between different locations".

So far access to the health facility is concerned 80-90 per cent of the respondents feel no change, 10-13 per cent respondents indicated that access to Hospitals/Basic Health Unit has become more difficult due to some diversions whereas about 6% indicated that there is time saving and reduction in distance in reaching the hospitals (Tables 2, 3).

Table 2

Access to Health Facilities

(NO. OF RESPONDENTS)

Access	Hospital		B. H. U		Clinic	
	Existing	New	Existing	New	Existing	New
Easy	7	--	1	1	--	1
(%age)	6.1	--	0.9	0.9	--	0.9
Difficult	15	1	12	--	7	--
(%age)	13.2	0.9	10.5	--	6.1	--
No change	92	113	101	113	107	113
(%age)	80.7	99.1	88.6	99.1	93.9	99.1

Table 3

Distance to the Health facilities

(NO. OF RESPONDENTS)

Access	Hospital		B. H. U.		Clinic	
	Existing	New	Existing	New	Existing	New
Decreased	6	--	--	1	--	1
(%age)	5.3	--	--	0.9	--	0.9
Increased	15	1	12	--	7	--
(%age)	13.3	0.9	10.5	--	6.1	--
No change	92	113	101	113	107	113
(%age)	81.4	99.1	89.5	99.1	93.9	99.1

6.2 Education

The condition of the elementary schools in most of the villages is still not satisfactory. These are housed in broken buildings, with no drinking water facility, insufficient staff (2-3 teachers for one primary school) and in-sufficient and broken furniture.

The field survey does not show very sharp difference in educational facility. In fact almost each and every village has primary school, therefore, question of change in access to this elementary level of education does not arise. However for secondary education, about 89% of sampled population feel no change as these secondary schools are either in their own villages or in the nearby villages. However, more than 11 per cent face more difficulties in reaching their schools than the period before the construction of motorway because most of these schools are on the other side of the motorway. For college and vocational education, there appears some improvement as 4.4% have indicated that they are better off due to the motorway, 13.2 per cent complained that they do not feel comfortable, whereas 82.4 per cent say that they do not think there is any change (Table 4). Approximately similar is the position in respect of change in the distance (Table 5).

Table 4

Access to Education

Access	Primary School		Secondary School		College		Vocational	
	Male	Female	Male	Female	Male	Female	Male	Female
Easy	--	--	--	--	5	5	5	5
(%age)	--	--	--	--	4.4	4.4	4.4	4.4
Difficult	--	--	13	13	15	15	13	13
(%age)	--	--	11.4	11.4	13.2	13.2	11.4	11.4
No change	114	114	101	101	94	94	96	96
(%age)	100.0	100.0	88.6	88.6	82.4	82.4	84.2	84.2

Table 5

Distance to the Educational Institution

Access	Primary School		Secondary School		College		Vocational	
	Male	Female	Male	Female	Male	Female	Male	Female
Decreased	--	--	--	--	5	5	5	5
(%age)	--	--	--	--	4.4	4.4	4.4	4.4
Increased	--	--	13	13	15	15	13	13
(%age)	--	--	11.4	11.4	13.2	13.2	11.4	11.4
No change	114	114	101	101	94	94	96	96
(%age)	100.0	100.0	88.6	88.6	82.4	82.4	84.2	84.2

6.3 Trade and Small Manufacturing Industries

The major occupational group in these areas is Agriculture, animal husbandry and forestry, fisheries etc which constitutes about 45% of the total labour force. The other important occupational groups include production and related workers, transport and sales workers which are about 37 per cent of the entire labour force. This group has to move from one place to other to reach their work place. The motorway has not brought any remarkable change for more than 80 per cent of the respondents. On the other hand, 14 per cent complained that their travel time as well as travel distance has increased due to diversions caused by the motorway and about 4 per cent say that time and distance in reaching their work places has decreased (Table 6.) The changes in distance are illustrated in Table 7.

6.4 Transport Communications and other facilities

Movement of passengers and transportation of freight has improved to the tune of 35 and 34 per cent respectively whereas 14 per cent of passengers and 11 per cent of freight movement have been obstructed by the motorway. There is no impact on 51% of the villages around. Thirty per cent of people say that mobility has improved specially in the direction of big cities (Table 8). The changes in travelling distance occurring due to motorway can be judged from Table 9.

Table - 6

Access to Business & Small Manufacturing Industries

(NO. OF RESPONDENTS)

Access	Business		Small Manufacturing Industries	
	Market	Retail Shops	Old	New
Easy	5	--	4	4
(%age)	4.4	--	3.5	3.5
Difficult	16	1	3	--
(%age)	14.0	0.9	2.7	--
No change	93	113	107	110
(%age)	81.6	99.1	93.8	96.5

Table - 7

Distance to the Business & Small Manufacturing Industries

(NO. OF RESPONDENTS)

Access	Business		Small Manufacturing Industries	
	Market	Retail Shops	Old	New
Decreased	5	--	--	--
(%age)	4.4	--	--	--
Increased	16	1	7	4
(%age)	14.0	0.9	6.4	3.5
No change	93	113	107	110
(%age)	81.6	99.1	93.6	96.5

Table - 8

Access to Transport & Communication & Other facilities

Access	(NO. OF RESPONDENTS)					
	Transport		Communication		Other	
	Passenger	Freight	Post Office	PCO	Religious	Social
Easy	35	34	--	--	5	3
(%age)	30.7	29.8	--	--	4.4	2.6
Difficult	14	11	9	8	7	14
(%age)	12.3	9.7	7.9	7.0	6.1	12.3
No change	65	69	105	106	102	97
(%age)	57.0	60.5	92.1	93.0	89.5	85.1

Table - 9

Distance to the Transport, Communication & Other facilities

Access	(NO. OF RESPONDENTS)					
	Transport		Communication		Other	
	Passenger	Freight	Post Office	PCO	Religious	Social
Decreased	22	22	--	--	4	2
(%age)	19.5	19.5	--	--	3.5	1.8
Increased	26	22	9	8	8	15
(%age)	23.0	19.5	7.1	7.9	7.0	13.1
No change	65	69	105	106	102	97
(%age)	57.5	61.0	92.9	92.1	89.5	85.1

7. Land Use

About 40-45% of the villagers have complained that their land has been divided. This is the most serious problem, as more than eight thousand acres of highly fertile land from Lahore to Kallar Kahar has been unnaturally divided in a 240 kilometers stretch. The land owners are facing difficulties in transportation of their produce from farms to the safer places. Not only this but they have also been deprived of the women labour force, as their land has been divided, the women cannot travel long distance to reach their divided land and thus they cannot work along side their men folk.

About 25.6% of the people have complained that under-passes are narrow and lower than the normal ground level. These are flooded during monsoon and in some of these, stagnant water could be seen even in fair weather conditions. Due to the construction of the motorway and its allied interchanges, some areas have been enclosed in pockets and these are terribly flooded during rainy season. Water supply lines from the canals and other sources have been disrupted. About 11.6% complained the increase in irrigation problem as the water supply through narrow passages and drains under the motorway is usually choked.

People also complained about the difficulties being faced in access to motorway as local transport is either not available or if available is very expensive.

Apart from all these difficulties, people opined that travel time to Lahore/Islamabad has been reduced and travel has been made comfortable, but is expensive (Annex-II).

8. Traffic Analysis

The traffic on the Motorway is very low, more than 3 years have passed since it was opened for traffic but the average daily traffic (both directions) on the motorway has never been more than 4,300 VPD. The maximum and minimum traffic observed on the motorway is 5,400 and 3,800 VPD on Lahore-Sheikhupura and Pindi Bhattian-Kot Momin Sections respectively (Table 10). Very few vehicles travel through to the motorway (Islamabad to Lahore or Lahore to Islamabad). Most of the users travel short distances on the motorway as they enter from one intersection and leave the motorway on the other intersection (Tables 11 & 12). Comparison of traffic during October 1999 and April 2000 (Table 10) shows that there is hardly any improvement in traffic. In August 1998 the average daily traffic (both directions) was 3,580 vehicles per day which has improved to 4,300 vehicles per day in September, 2000. The share of traffic by type of vehicles is as under:

<u>Vehicle</u>	<u>August</u> <u>1998</u>	<u>July</u> <u>1999</u>	<u>December</u> <u>1999</u>	<u>September</u> <u>2000</u>
Car	38.5	46.4	41.8	49.9
Wagon	25.2	22.3	23.2	22.1
Coach	7.1	5.2	5.2	5.0
Bus	17.3	17.2	17.9	16.2
Truck	10.7	7.3	10.8	6.2
Trailer	1.2	1.6	1.1	0.6

The details of average daily traffic by type of vehicle on each and every intersection w.e.f. July 1998 to September, 2000 are given in Tables 13 to 16. Since 1998 to September, 2000 the traffic growth is 8.7% per year. On the basis of this growth the projected traffic (both directions) would be as under:

Traffic (Both Direction)

Actual		Projected @ 8.7% growth rate									
1998	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
3580	4307	4685	5095	5542	6028	6556	6713	7756	8436	9176	9980

From the above estimates upto 2010, vehicle traffic demand will not become high enough to exceed the capacity of even a 4 lane dual carriageway and would not be sufficient to support the Motorway project.

9. Revenues

Revenue earned through toll collection and fine is shown in Table 17 and 18. A growth rate of 1.03% has been witnessed in respect of revenue collection.

The Motorway (M-2) may not be able to increase its revenue significantly because of relatively elastic demand i.e. in this case demand cannot be entirely insensitive. For improving the revenue, there are two options-either increase the toll fee provided traffic does not decrease, or decrease the toll fee and attract the traffic. The revenue is equal to the product of price and quantity. As the

toll is already beyond the reach of the most of the users, therefore by increasing the toll there may be a significant fall in the traffic. The other option is to decrease the toll charges. Again the demand is not perfectly elastic, therefore it may not be possible to attract the traffic so as to have sufficient increase in revenues, on the other side total revenue receipts (i.e. price \times quantity) may decrease. It may be suggested here that before taking any step regarding change in toll tax, a study highlighting the issues for increasing the net earnings may be carried out.

10. Accident Statistics (Motorway M-2)

More than 75 people die on motorway every year in more than 450 traffic accidents as given in Table 19. This figure is very high particularly in the presence of well equipped Pakistan Motorway Police.

11. Conclusions

The analysis of the study reveals that Motorway (M-2) has very little positive impact on the life of the people around the Motorway. Rather more difficulties have been caused in access to various facilities, such as, Health, Education, Business and Industry.

Table 10
Summary of AVERAGE DAILY TRAFFIC ON MOTORWAY (M-2) (1998-2000)

Section	August, 1998			July, 1999			December, 1999			September, 2000		
	Lahore-Islamabad	Islamabad-Lahore	Total	Lahore-Islamabad	Islamabad-Lahore	Total	Lahore-Islamabad	Islamabad-Lahore	Total	Lahore-Islamabad	Islamabad-Lahore	Total
	Lahore-Sheikhupura	2268	2185	4453	2592	2232	4824	2542	2549	5091	2869	2550
Sheikhupura-Pindi Bhattian	2108	1956	4064	2237	1721	3958	2247	2515	4762	2585	2292	4877
Pindi Bhattian-Kot Momin	1771	1658	3429	1735	1500	3235	1756	2174	3930	2041	1771	3812
Kot Momin-Salam Chowk	1520	1674	3194	1788	1533	3321	1802	2152	3954	2047	1802	3849
Salam Chowk-Lilla	1823	1926	3749	1982	1776	3758	2041	2291	4332	2207	2123	4330
Lilla-Kalar Kahar	1662	1612	3274	1879	1610	3489	1876	1956	3832	2136	1970	4106
Kalar Kahar-Baikasar	1518	1502	3020	1726	1507	3233	1694	1394	3488	1963	1825	3788
Baikasar-Chakri	1790	1751	3541	2132	1816	3948	2000	2078	4078	2184	2197	4381
Chakri-Islamabad	1768	1725	3493	2044	1751	3795	1955	2021	3976	2115	2083	4198
Average Traffic	1803	1777	3580	2013	1716	3729	1990	2170	4160	2233	2068	4301

Table II

Section wise In / Out and Net Average Traffic on Motorway (M-2) (October, 1999)

Lahore - Islamabad (North Bound)

Vehicle	LHR		Sheikhupura		Pindi Bhattian		Kot Momin		Salam Chowk		Lilla		Kalar Kahar		Balkasar		Chakri		IBD							
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT						
CAR	1579	143	456	1266	256	688	834	53	41	846	182	115	913	50	66	897	76	113	860	151	50	961	18	50	929	929
WAGON	515	60	99	476	134	268	342	45	30	357	181	76	462	65	115	412	64	91	385	217	42	560	15	32	543	543
COACH	132	49	25	156	54	107	103	10	18	95	60	37	118	26	32	112	12	43	81	32	12	101	2	1	102	102
BUS	273	54	8	319	130	115	334	55	97	292	92	65	319	67	74	312	21	42	291	82	56	317	7	16	308	308
TRUCK	224	104	91	237	120	196	161	19	22	158	96	51	203	66	43	226	15	46	195	16	12	199	4	9	194	194
TRUCK-TRAILER	50	14	31	33	17	24	26	1	1	26	2	16	12	4	8	8	0	0	8	1	1	8	1	0	9	9
TOTAL	2773	424	710	2487	711	1398	1800	183	209	1774	613	360	2027	278	338	1967	188	335	1820	499	173	2146	47	108	2085	2085

Source: Pakistan Revenue Automation (Pvt) Ltd.

Motorway Project (M-2)

SECTION-WISE IN/OUT AND NET AVERAGE TRAFFIC ON M-2 IN OCT. 1999 LAHORE - ISLAMABAD (NORTH BOUND)

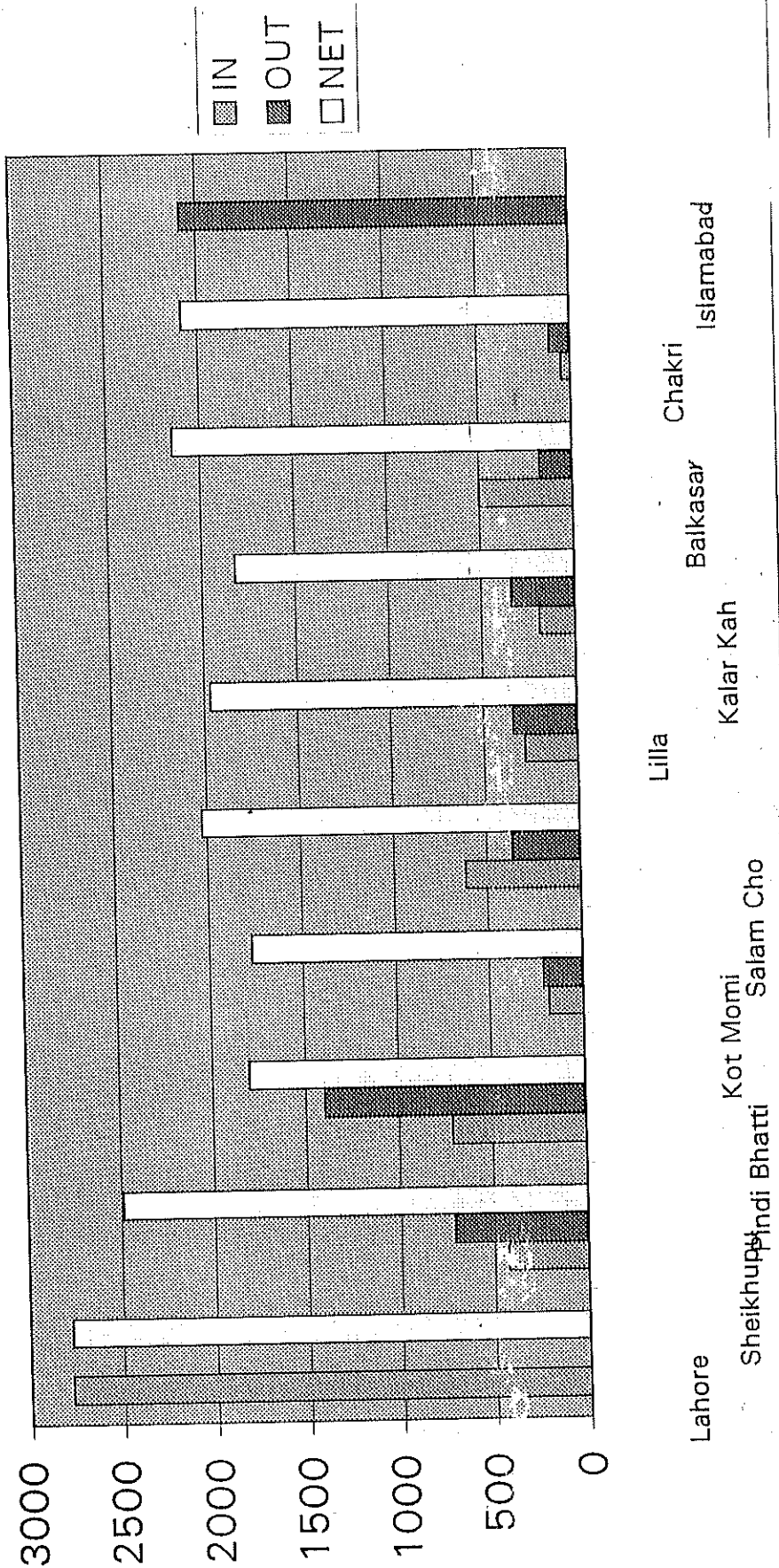


Table 12
Sectionwise in/out and Net Traffic on Motorway (M-2) October, 1999.
Islamabad - Lahore (South Bound)

Vehicle	IBD		Chakri			Balkasar			Kalar Kahar			Lilla			Salam Chowk			Kot Momin			Pindi Bhattian			Sheikhupura			Lahore	
	In	Out	In	Out	Net	In	Out	Net	In	Out	Net	In	Out	Net	In	Out	Net	In	Out	Net	In	Out	Net	In	Out	In	Out	
Car	774	46	34	786	41	126	701	77	51	727	45	33	739	103	142	700	31	37	694	528	187	1035	272	90	1217	1217		
Wagon	533	42	18	557	34	201	390	78	45	423	110	55	478	55	200	333	20	23	330	251	136	445	147	87	505	505		
Coach	94	1	1	94	7	30	71	36	8	99	24	19	104	38	55	87	15	11	91	94	48	137	37	58	116	116		
Bus	376	12	3	385	15	40	360	32	21	371	64	54	381	99	123	357	70	63	364	145	159	350	86	135	301	301		
Truck	231	22	22	231	32	37	226	47	28	245	101	27	319	32	90	261	13	18	256	65	196	125	220	35	310	310		
Trk/Trailer	29	4	4	29	3	15	17	2	0	19	31	1	49	5	6	48	0	0	48	5	46	7	37	6	38	38		
TOTAL	2037	127	82	2082	132	449	1765	272	153	1884	375	189	2070	332	616	1786	149	152	1783	1088	772	2099	799	411	2487	2487		

SECTION-WISE IN/OUT AND NET TRAFFIC ON MOTORWAY (M-2) OCTOBER, 1999.
ISLAMABAD - LAHORE (SOUTH BOUND)

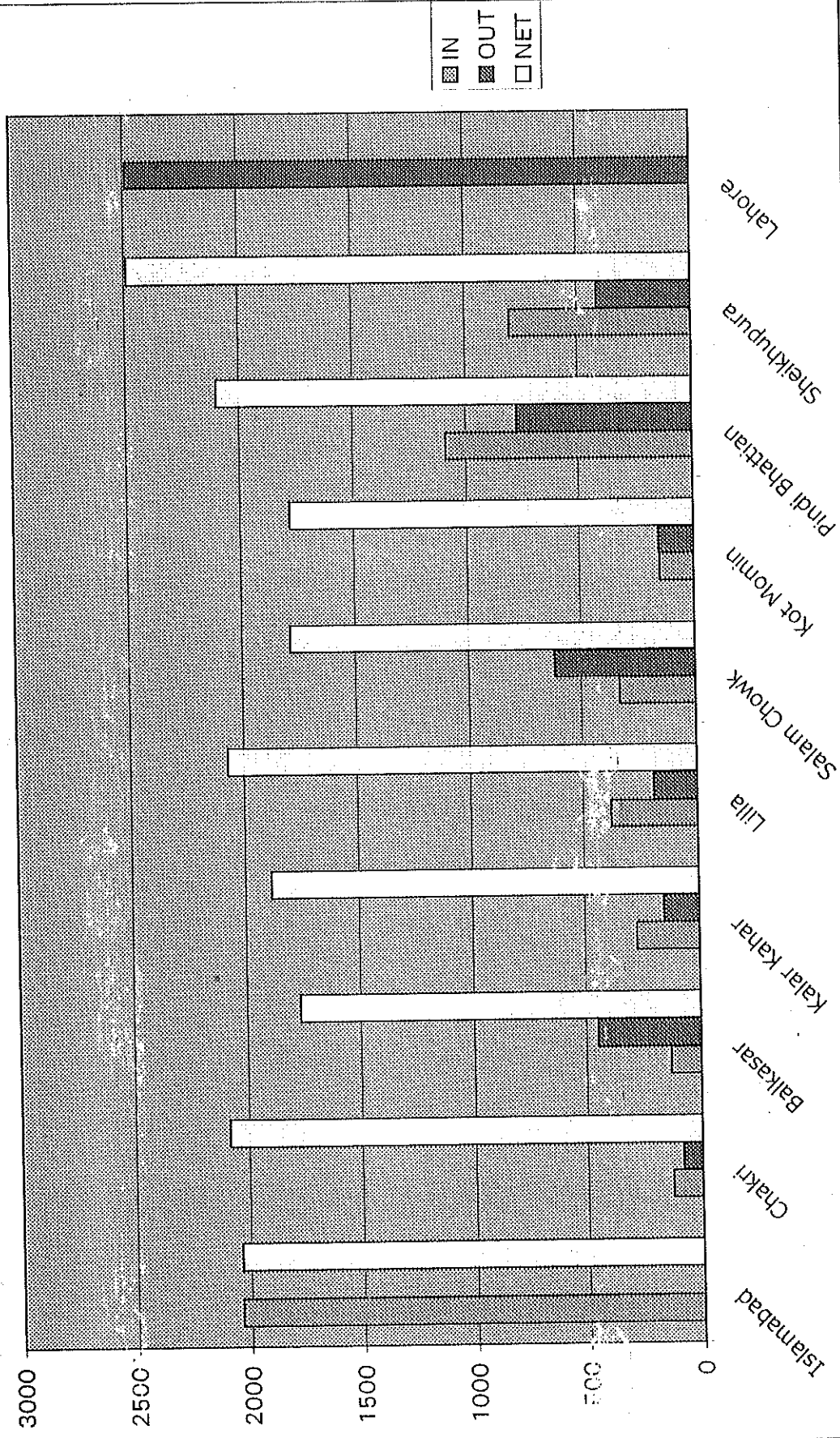


Table 13
Average Daily Traffic Motorway (M-2) August, 1998

Vehicle	Lahore-Islamabad (North Bound)										Islamabad-Lahore (South Bound)									
	Lahore	Sheikhu-pura	Pindi-Bhattian	Kot Momin	Salam	Lilla	Kalar Kahar	Balkasar	Chakri	Islamabad	Islamabad	Chakri	Balkasar	Kalar Kahar	Lilla	Salam	Kot Momin	Pindi Bhattian	Sheikhu-pura	Lahore
Car	1270	1113	795	365	560	336	548	535	776	776	766	768	599	582	389	514	398	878	1224	1224
Wagon	445	295	338	290	483	522	449	689	536	536	455	531	428	477	604	444	317	374	428	428
Coach	111	137	136	108	182	168	159	116	34	34	86	33	98	169	195	167	118	151	107	107
Bus	238	116	207	590	295	409	182	367	262	262	293	259	308	193	474	271	643	229	229	229
Truck	170	363	266	160	277	199	177	76	149	149	112	147	63	188	231	255	174	293	164	164
Trailer	34	84	28	7	26	28	3	7	11	11	13	13	6	3	33	23	8	31	33	33
TOTAL	2268	2108	1771	1520	1823	1662	1518	1790	1768	1768	1725	1751	1502	1612	1926	1674	1658	1956	2185	2185

Table 14
Average Daily Traffic Motorway (M-2) July, 1999

Vehicle	Lahore-Islamabad (North Bound)										Islamabad-Lahore (South Bound)									
	Lahore	Sheikhu-pura	Pindi-Bhattian	Kot-Momin	Salam	Lilla	Kahar	Balkasar	Chakri	Islamabad	Islamabad	Chakri	Balkasar	Kahar	Lilla	Salam	Kot-Momin	Pindi-Bhattian	Sheikhu-pura	Lahore
Car	1312	1001	881	915	939	922	885	982	950	950	737	769	672	692	711	675	639	796	1082	1082
Wagon	540	463	314	335	443	392	365	533	516	516	452	487	331	373	417	319	298	411	473	473
Coach	119	151	84	83	102	96	66	85	86	86	88	88	68	102	104	79	87	139	113	113
Bus	264	323	348	345	375	366	345	369	360	360	320	328	305	320	329	297	302	271	213	213
Truck	265	257	69	73	101	84	47	144	112	112	126	125	116	109	177	127	138	86	282	282
Trailer	92	42	38	37	22	19	18	19	20	20	18	18	15	14	38	36	36	16	69	69
TOTAL	2592	2237	1735	1788	1982	1879	1726	2132	2044	2044	1751	1816	1507	1610	1776	1533	1500	1721	2232	2232

Table 15
Average Daily Traffic Motorway (M-2) December, 1999

Vehicle	Lahore-Islamabad (North Bound)										Islamabad-Lahore (South Bound)									
	Lahore	Sheikhupura	Pindi-Bhattian	Kot Momin	Salam	Lilla	Kahar Kahar	Balkasar	Chakri	Islamabad	Islamabad	Chakri	Balkasar	Kahar Kahar	Lilla	Salam	Kot Momin	Pindi Bhattian	Sheikhupura	Lahore
Car	1364	1109	767	778	816	804	755	825	810	810	772	788	702	727	743	713	722	1134	1315	1315
Wagon	508	451	310	352	475	397	360	537	516	516	532	560	412	449	517	513	495	637	666	666
Coach	135	164	109	102	121	115	78	98	98	98	87	87	73	107	114	91	96	154	135	135
Bus	274	320	340	343	390	382	366	398	394	394	396	401	377	392	412	389	397	387	336	336
Truck	212	184	192	191	232	175	131	139	134	134	215	223	213	264	469	402	414	188	54	54
Trailer	49	19	38	36	7	3	2	3	3	3	19	19	17	17	36	44	50	15	43	43
TOTAL	2542	2247	1756	1802	2041	1876	1694	2000	1955	1955	2021	2078	1794	1956	2291	2152	2174	2515	2549	2549

Table 16
Average Daily Traffic Motorway (M-2) September, 2000

Vehicle	Lahore-Islamabad (North Bound)										Islamabad-Lahore (South Bound)												
	Lahore	Sheikhu-pura	Pindi-Bhattian	Kot Momin	Salam Lilla	Kahar Lilla	Kahar Kahar	Balkasar	Chakri	Islamabad	Islamabad	Chakri	Islamabad	Islamabad	Balkasar	Kahar Kahar	Lilla	Salam Momin	Kot Momin	Pindi Bhattian	Sheikhu-pura	Lahore	
Car	1612	1265	1111	1111	1175	1146	1104	1167	1133	1133	1133	912	968	854	878	887	773	761	1148	1363	1363	1363	1363
Wagon	510	487	354	369	451	391	345	501	451	451	451	597	656	452	500	547	434	414	563	578	578	578	578
Coach	122	170	113	107	120	115	78	95	94	94	94	76	77	64	103	112	107	113	158	122	122	122	122
Bus	322	355	345	345	345	387	377	381	381	381	381	352	356	343	352	381	322	326	339	310	310	310	310
Truck	227	282	105	103	103	92	58	59	55	55	136	131	131	110	135	208	157	148	82	157	157	157	157
Trailer	76	46	13	12	13	5	1	1	1	1	10	9	2	2	2	8	9	9	2	23	23	23	23
TOTAL	2869	2585	2041	2047	2207	2136	1963	2184	2115	2115	2115	2083	2197	1825	1970	2123	1802	1771	2292	2552	2552	2552	2550

Table 17
Revenue Collected
(Toll + Fine)

P e r i o d	T o t a l	(Rs.)	
		Average (per month)	Average (per day)
Jan-Dec. 1998	490,552,480	40,879,373	1,343,979
Jan-Dec. 1999	501,121,660	41,760,138	1,372,361
Jan-Aug. 2000	336,102,800	42,012,850	1,377,471

Table 18
Average Daily Revenue Collection
by type of vehicle

V e h i c l e	1998	1999	2000 (Jan-Aug.)
Car	380,346 (28.3%)	424,059 (30.9%)	484,870 (35.2%)
Wagon	235,196 (17.5%)	203,109 (14.8%)	245,190 (17.8%)
Coach	112,894 (8.4%)	82,342 (6.0%)	84,026 (6.1%)
Bus	306,427 (22.8%)	369,165 (26.9%)	356,765 (25.9%)
Truck	264,764 (19.7%)	260,749 (19.0%)	179,071 (13.0%)
Truck Trailer	44,352 (3.3%)	32,937 (2.4%)	27,549 (2.0%)

Table 19
Month-wise Accident Statistics (Motorway M-2)

Year	Month	Total Accidents	Death	Major Injuries	Minor Injuries	Source
1997	Nov.	17	4	7	29	PMP
	Dec.	41	5	8	42	PMP
1998	Jan.	37	1	9	47	PMP
	Feb.	41	0	8	39	PMP
	Mar.	39	3	10	34	PMP
	April	46	8	22	41	PMP
	May	38	4	18	39	PMP
	June	52	11	54	86	PMP
	July	59	6	22	70	PMP
	Aug.	46	4	17	54	PMP
	Sept.	34	6	17	80	PMP
	Oct.	30	5	17	53	PMP
	Nov.	32	14	19	52	PMP
	Dec.	61	11	21	112	PMP
1999	Jan.	34	7	10	36	PMP
	Feb.	22	1	10	23	PMP
	Mar.	33	2	53	49	FWO
	April	39	5	28	63	PMP
	May	27	2	11	45	PMP
	June	26	1	5	23	PMP
	July	55	6	53	83	FWO
	Aug.	36	3	18	50	PMP
	Sept.	21	2	20	39	FWO
	Oct.	28	8	45	59	FWO
	Nov.	30	8	50	108	FWO
	Dec.	30	55	41	59	FWO
2000	Jan.	30	6	30	41	FWO
	Feb.	30	3	20	27	FWO
	Mar.	23	3	12	19	FWO
	April	21	2	16	22	FWO
	May	81	8	22	102	PMP
	June	35	0	22	36	FWO
	July	26	4	11	45	FWO
Total		1200	209	726	1707	

QUESTIONNAIRE

1. Village Name _____
2. Distance From : i) Motorway Fence _____
 ii) Nearest Interchange _____

3. The Motorway has made the access to / changes

A. Health		<u>Access</u>		<u>Distance (Kms)</u>	
		Difficult	Easy	Increased	Decreased
i)	Hospital				
	Existing	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	New	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
ii)	B.H.U.				
	Existing	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	New	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
iii)	Clinic				
	Existing	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	New	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
B. Education					
i)	Primary				
	Male	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	Female	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
ii)	Secondary				
	Male	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	Female	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
iii)	College				
	Male	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	Female	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
iv)	Vocational				
	Male	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	Female	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

	Access		Distance (Kms)	
	Difficult	Easy	Increased	Decreased
C. Business				
i) Market	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
ii) Retail Shops	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
D. Communication Facilities				
i) Post Office	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
ii) PCO	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
E. Others				
i) Religious Places	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
ii) Social Places	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
4. Transport Facilities				
i) Passengers	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
ii) Freight	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
5. Small Manufacturing Industries				
Old	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
New	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
6. General Observation:	_____			

Date _____

Name of Surveyor _____

Signature _____

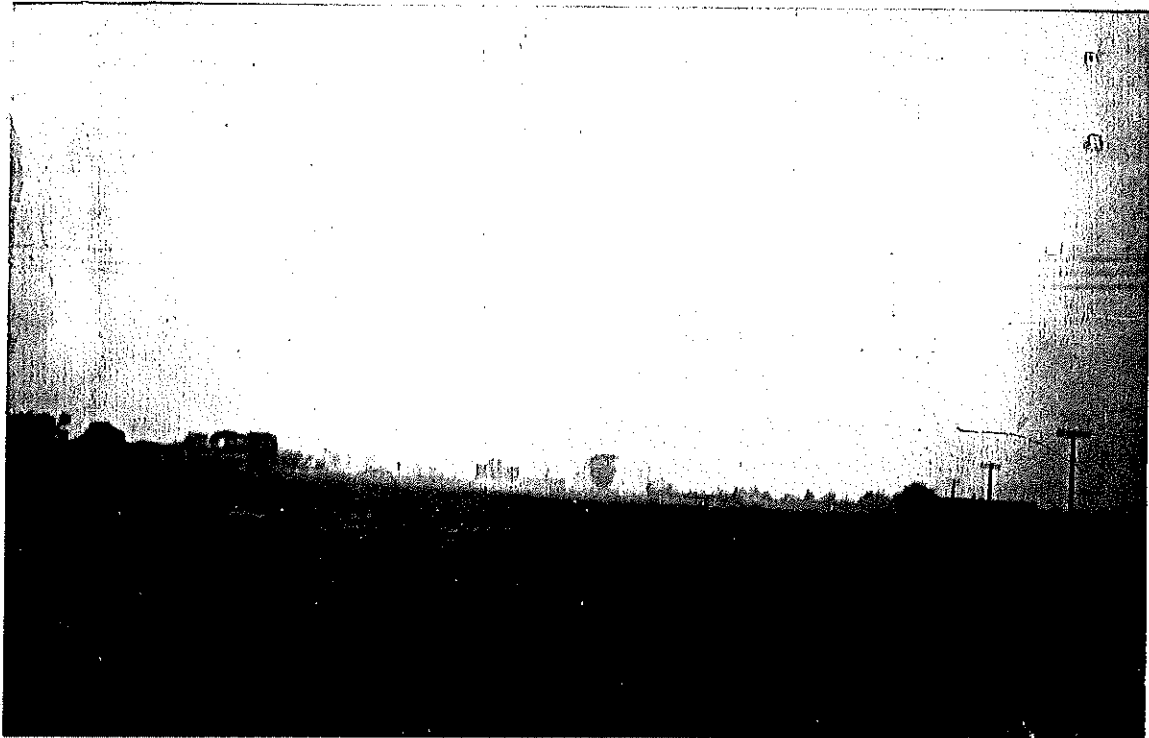
Impact of Motorway (M-2) on the Socio-Economic Development of the Adjoining Rural Areas

SI #	Village	Land Use/Under-pass	Land Acquisition Price/acre.	Per Acre Yield (Rs.)	Irrigation Canal/Barani	Others
1	Sihal	Difficulties in transportation of agriculture produce and other goods.	880,000/acre	-	Barani	
2	Chak Dihal	-	880,000 to 1,040,000	-	Barani	
3	Khalian Hamid	-	350,000 to 1,040,000	-	Barani	Health problems
4	Chocora	-	"	-	Barani	Local transport for Motorway not available Fare increased poor people are not happy.
5	Dhari	Stagnant water	"	-	Barani	Access to Lahore become easy
6	Lammah Rah	-	69,000/acre	-	Barani	Better chances of labour social life disturbed as criminals increase due to M/way.
7	Chakri	-	1,040,000	-	Barani	Already rich people have become financially better as their land price has increased.
8	Mari	-	32,000-40,000	-	Barani	Travel to Lahore eased. Access to main cities has been made difficult other the Lahore/ Islamabad as road which existed before M/way has been demolished.
9	Bakkhani Kalan	-	"	-	Barani	Access to Lahore/Islamabad eased. Poor people cannot afford Motorway.
10	Balkasar	-	"	-	Barani	Flood increased.
11	Hastai	-	"	-	Barani	Land acquired at cheaper rate than market rate. Education problems increasing. No improvement since late 60's.
12	Munday	Land divided	30,000-35,000	-	Barani	Generally people have no idea business people.
13	Tohha Bahadur	-	30,000-35,000	-	Barani	Travel to big cities eased. Land acquired at cheaper rate.
14	Marath Sharif	Land divided	"	-	Barani	
15	Begal	Access to their own land difficult	"	-	Barani	Land and village on opposite sides.
16	Chak Khushi	Access to their own land became difficult	"	-	Barani	Travel distance/time decreased for big cities.

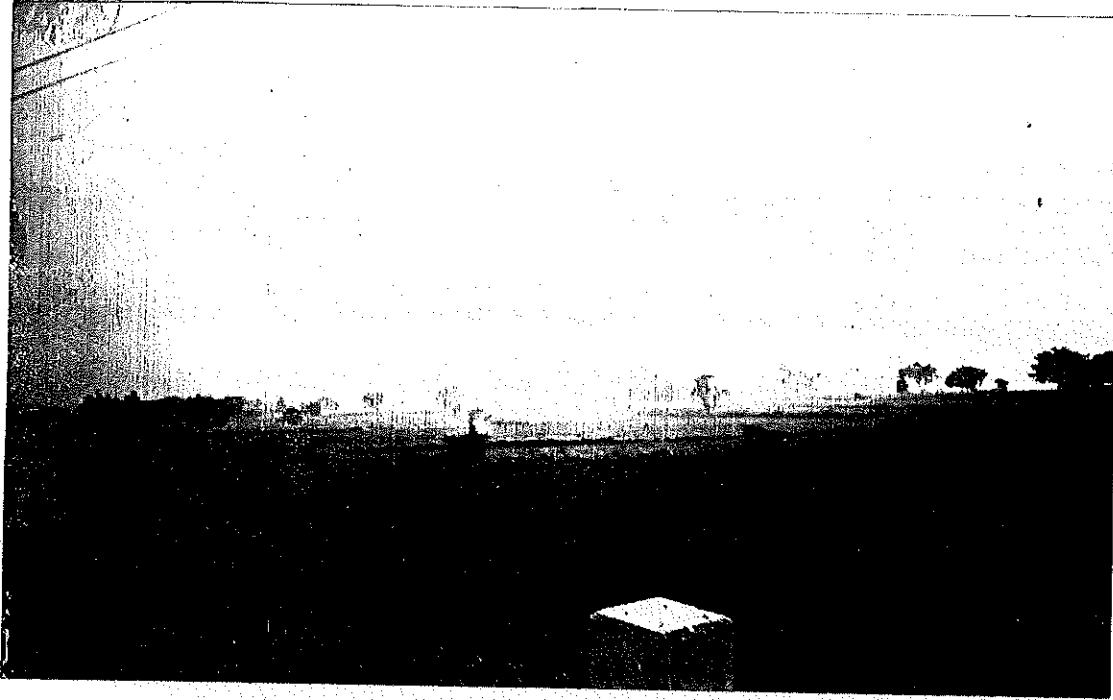
18	Khandoa					Barani	Schools for children still give the look of stone age.
19	Amble	Not proper land divided.				Barani	Access to village for transportation of goods and produce became difficult
20	Ratta	Land divided - Narrow	9,600(cheap)			Barani	Travel expenses/time to Rawalpindi increased but eased for Lahore.
21	Chakora	Land divided and badly affected due to Motorway.	720,000(Bldg) Fertile land 64,000-96,000			Barani	
22	Karoli		96,000(Agri.) 176,000 (inside village)			Barani	
23	Joba		112,000			Barani	No improvement in respect of education/health No drinking water, unfair land price. They favour Mway.
24	Ather	Under-passes lower than ground level flooded during rains.	112,000			Barani	
25	Lilla		112,000			Barani	
26	Phullenwan Old	Flooded during rains very narrow. Fruit gardens either divided or no more	80,000	Rs. 25,000/- (fruits)		Barani/ canal	
27	Chak No.6 MLA	Narrow and flooded	80,000			Barani	Waterways across the land blocked
28	Salam	Small & flooded land divided	80,000-90,000			Canal	Irrigation problems due to blockade of canal water.
29	Dera Lal Khan		85,000			Barani/ Canal	
30	Dera Madan Sahni		80,000-90,000			"	
31	Kot Raja	Under-passes are not big.	67,000-110,000	30,000- 35,000 wheat 25-35 maunds/acre		"	
32	Quaraur	Normal except in Monsoon	69,000	Wheat 25-40 maunds Sugarcane 400-800 maunds		Canal	Schools are not in good condition
33	Kot Momin		130,000	Wheat 20 maunds		Canal	People are not satisfied regarding land acquisition
34	Dera Gawah					Canal	
35	Iqbal Nagar	Low quality				Canal	
36	F. Khans Sherif	Narrow under-passes				Canal	

37	Chak 20 Janubi	Narrow	115,000	Wheat Rs. 5,500 Fruit 25,000-30,000	Canal	Waterways blocked.
38	Zaman Park		50,000-60,000			
39	Pacca Dera		42,000	Wheat 40-45	Canal / Tubewell	Land acquired at very low rate
40	Dera Cheema			Rice 45		
41	Bagh Kona	Land divided no underpass	40,000-45,000	Wheat 25-30 maunds	"	Land acquired at lower rate. Flood intensified.
42	Garhi Mambore	Very low. Full of water during rains	18,000-26,000	Wheat/Rice vegetable @ Rs.40,000 acre	"	They claim that their land acquired at very low rate
43	Chhapa	Low. flooded during rains	125,000- 150,000			

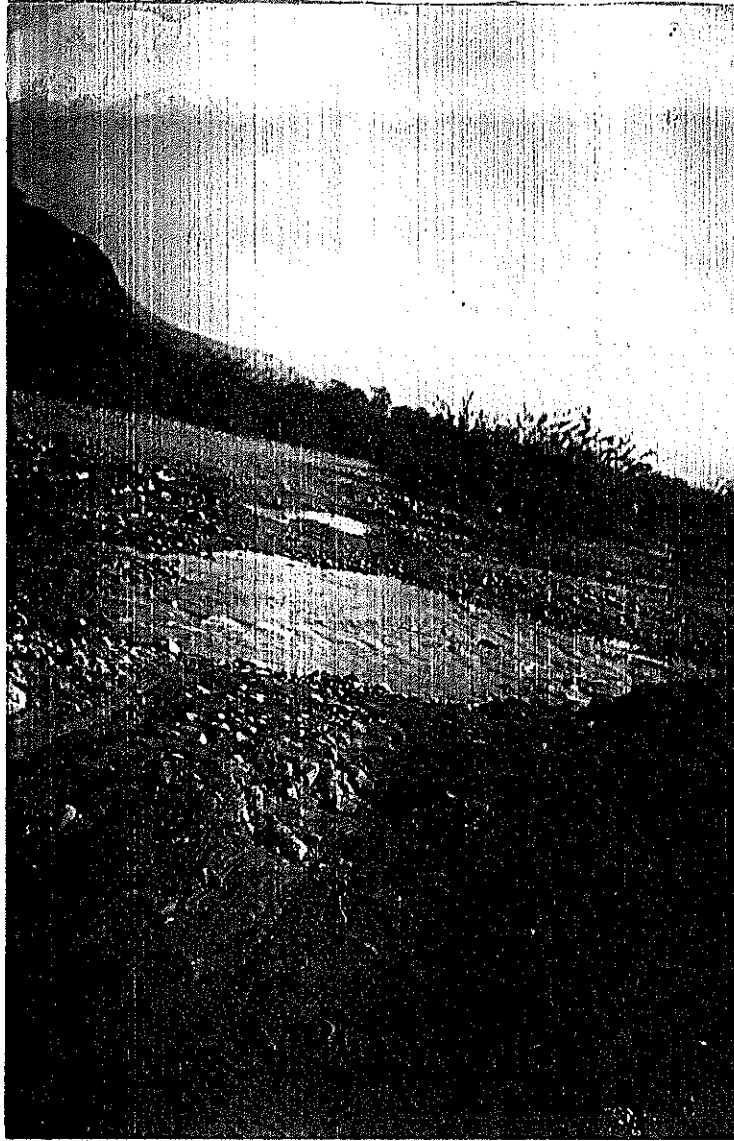
Type of the Land near Chakri Interchange



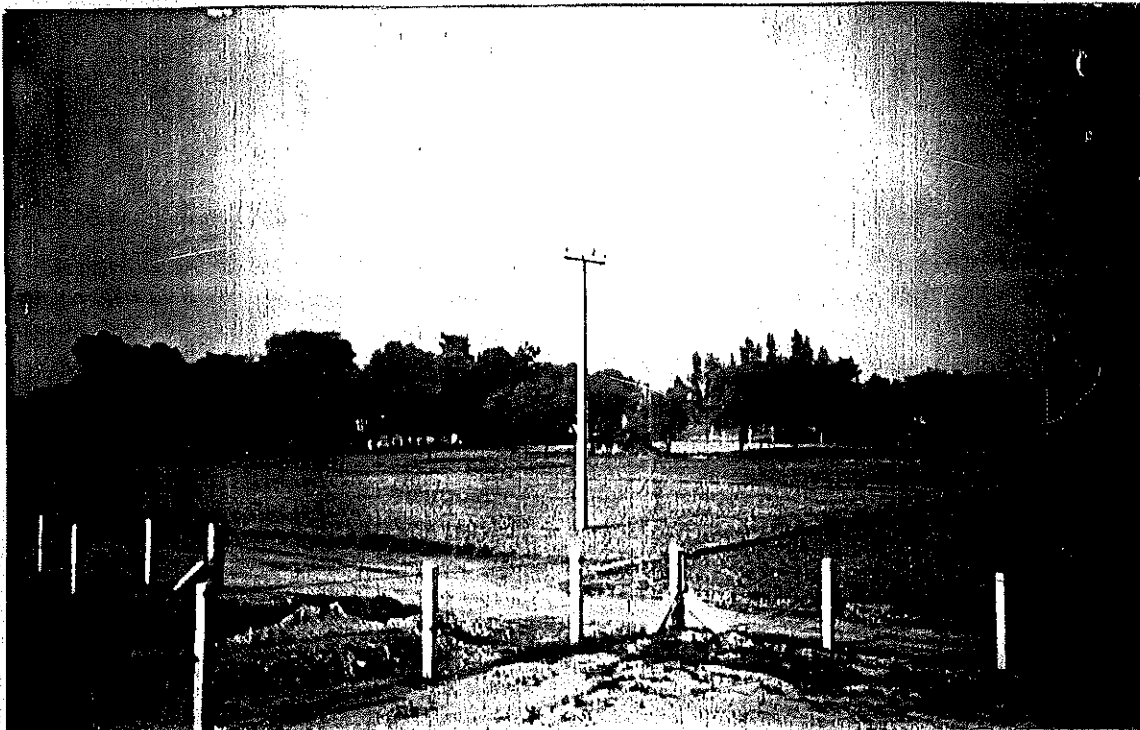
Type of Land near Balkasar Interchange



Broken access earth road at Khara Sharif near Kot Momin
Interchange



Type of Land near Salam Interchange



Underpass near Pindi Bhattian

