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IMPACT OF ROAD  
ON  
SOCIO-ECONOMIC DEVELOPMENT

SAJID MANSOOR  
Deputy Chief

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## EXECUTIVE SUMMARY

The purpose of this study is to see the effect of road improvement in the development of other sectors of economy. In the past many transport economists have realised the importance of transport and its mobility. Kindleberger (1965) states "transport is basic to the operation of economy and society. He further explains that an inefficient transport sector will adversely affect the progress of development, whilst improvements in transport may have far reaching effects.

In the present study efforts have been made to go along with the theory of kindleberger (1965) "As economies grow, so does the provision of transport facilities, this provision is positively correlated with the level of economic development."

Road is the most important means of surface transport particularly in the less developed countries. It will not be unfair to say that roads are also one of the basic infrastructures of socio-economic development, particularly of less developed regions. They help in bringing otherwise isolated rural areas closer to the economic and social life of the comparatively developed towns. In the first place socio-economic development of areas like agriculture, demography, health, education and social service were identified. Time series data regarding production of various agricultural crops and fruits; development of hospitals/dispensaries, and level of education concerning number of schools, teachers and enrolment was collected from the concerned agencies.

The data was analysed using regression equations in the linear and Log(e) form;  $y = a + bx$  &  $y = ax^b$ . The results were in favour of hypothesis, and could be seen that an increase in road density has direct impact on the improvement of all sectors of economy.

X Coefficients in some cases are negative. This inverse correlation does not mean that road development has no impact on socio-economic development. Viewing minutely at the concerned tables, it may be argued that the regions having negative Coefficients in respect of some crops have negligible production of these crops due to terrain and weather conditions.

't' test was applied to see the strength of our assumption. The test has strongly accepted the hypothesis.

This study is not as complete as required due to resource constraints and non availability of comprehensive cross sectional as well as time series data. In future a comprehensive study and evaluation of socio-economic development of the areas may be conducted. Socio-economic conditions of sampled areas may be studied before and after the construction of all weather road.

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## CHAPTER - I

### Introduction:

1.1 The significance of transport to the normal life of a country and its development lies in the fact that mobility is essential to the achievement of nearly every other aspect of economic growth. Kindleberger, (1965) has stated that "transport is basic to the operation of economy and society" in a space-bound system, it is vitally necessary in overcoming the friction of distance. Consequently, an inefficient transport sector will adversely affect the progress of development, whilst improvements in transport may have far reaching effects. "As economies grow, so does the provision of transport facilities, this provision is positively correlated with the level of economic development" (ibid).

Transport plays a major role in making land more productive in marketing farm products, in exploiting minerals and forests, in developing new industries and in export and import trade. It is also a critical element in achieving social objectives in the successful implementation of health and education programmes and in cultural changes.

The movement of goods and people is hardly desired for its own sake, it is needed to serve other objectives. Some of these objectives are: to exploit natural resources, to raise agricultural productivity, to increase industrial output, to enhance per capita consumption, and so forth. On the other hand, non economic objectives are defence, political and socially desirable locational patterns.

### 1.2 Transport Structure

A well articulated spatial system in which cities, towns and villages are closely linked and integrated with their surrounding rural areas, facilitates the flow and exchange of people, goods and services, promotes economic growth, and improves access to education, health care, communication facilities and other basic necessities of life. Despite substantial accomplishments during the last four to five decades, there is still a huge gulf between transport capabilities of the developed and developing countries.

Asia, Africa and Latin America contain 78 percent of the world population but account for only 18 percent of the world's rail freight, 29 percent of the world's passenger cars and commercial vehicles (buses and trucks). These less developed countries occupy 55.7 percent of the land area of globe, but have only 19 percent of surfaced roads (U.N. Statistics 1985).

The situation in Pakistan is not different from other developing countries. Despite major efforts made at

national and provincial level to improve the road transport structure in the country, 27 percent of the existing roads are still unimproved dirt roads impassable during rainy season, 23 percent low type brick or gravel roads and only 50 percent are black top surfaced roads, of which 62 percent are single lane (1989-90). However despite these unsatisfactory conditions road transport in Pakistan dominates inland transport both for passenger and goods.

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2. TRANSPORT EFFICIENCY

A well organized transport system in which cities, towns and villages are closely linked and integrated with their surrounding rural areas, provides economic exchange of goods and services, promotes economic growth, and improves access to education, health care, communication facilities and other basic necessities of life. Despite substantial improvements during the last four or five decades there is still a wide gap between transport facilities in the developed and developing countries.

Asia, Africa and Latin America contain 75 percent of the world population but account for only 13 percent of the world's rail freight, 30 percent of the world's passenger cars, and commercial vehicles (buses and trucks). These less developed countries consume only 0.7 percent of the land area of globe but have only 17 percent of surfaced roads (U.N. Statistics Dept).

The structure of Pakistan is not different from the developing countries. Pakistan has a different type of

## CHAPTER - II

### 2.1 Transport and Development

Transport plays a many faceted role in the pursuit of development objectives. Its function as a factor input is obvious - it enables goods and passengers to be transferred between and within production and consumption centres. It supports the transfer of labour from the rural to urban sector, and carries goods from one part to the other. As transportation of goods and services are essential for production and distribution, it helps both production and trade. A well developed system of transport facilitating the movement of men and materials is instrumental in increasing the levels of consumption, production and distribution, it helps both production and trade. A well developed system of transport facilitating the movement of men and materials is instrumental in increasing the levels of consumption, production and distribution, thereby accelerating the rate of economic growth. "It is generally accepted, that planning for the removal of poverty and unemployment has to begin with planning for the development of transport and communication in the rural areas, since in their absence any worthwhile scheme of development would simply be a non starter (singth, 1988).

There is an assumption that so long as transport capacity is inadequate to meet the needs of freight traffic, it is not essential to provide for passenger services or personal travel. In our view, this assumption stems from a limited appreciation of the fact that a segment of passenger traffic, particularly journeys to work and business is essential to development and maximisation of production and freight traffic.

Road is the most important means of surface transport particularly in the less developed countries and if such areas are in essence where railways have no access the roads are the only means of transport. It will not be unfair to say that roads are also one of the basic infrastructures of socio-economic development, particularly of less developed regions. They help in bringing otherwise isolated rural areas closer to the economic and social life of the comparatively developed urban towns. In other words roads are the essential arteries which remove regional imbalances and potential differences.

Experience in both the developed and developing countries makes it clear that roads have played a dominant role in economic uplift and development. In many cases lack of road has been the major missing element, impeding progress. But provision of road facilities does not always bring development. Projects built on the assumption that development will follow have led to costly disappointments at the cost of other sectors of economy which would have benefited more from the wasted investment on roads. Knowing,

where, when and under what circumstances investment on road will make a positive contribution is the fundamental question for the transportation economist.

To translate traffic into development can be derived on the basis of economic indices overall progress made in respect of health, education, industrial and mineral production.

## 2.2 Development Process - The Model.

A good transportation network and the development process are inter related and inseparable. The overview of the role of transportation in the development process can reveal that it lies in facilitating other objectives of development such as;

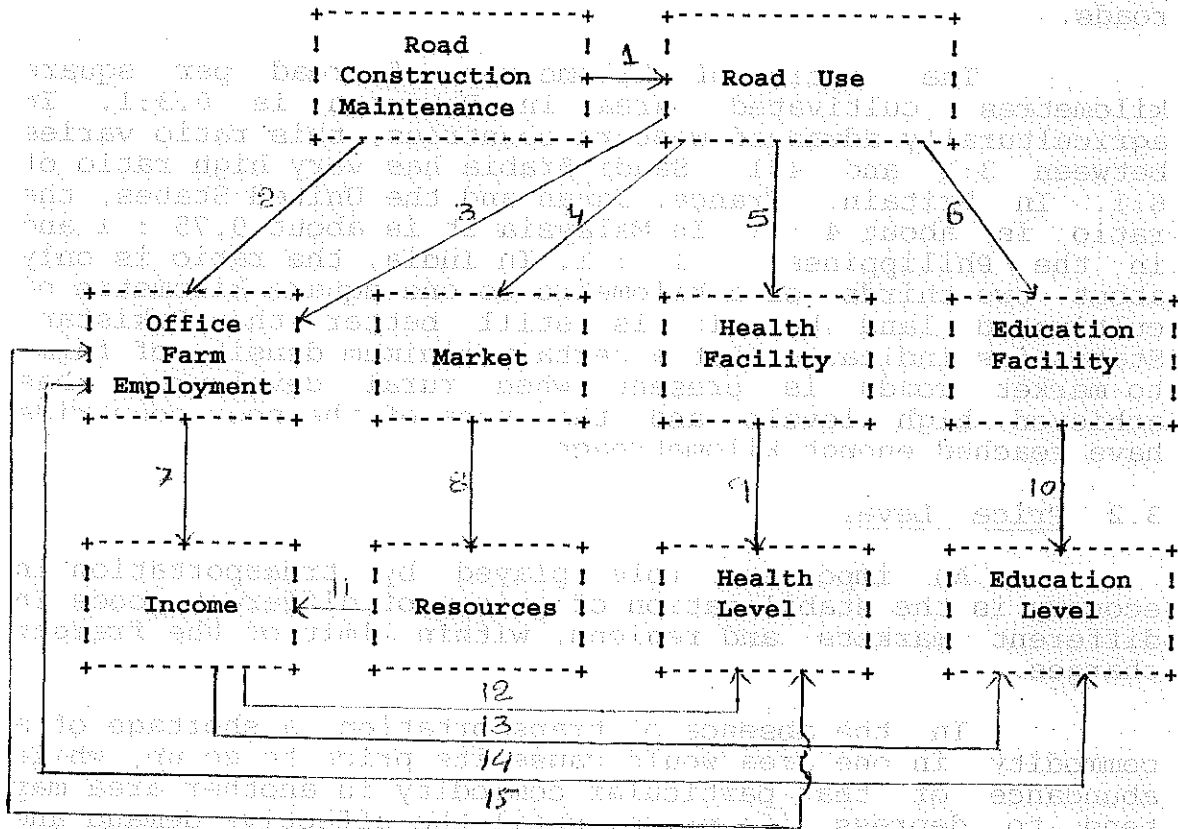
- i) Increased agricultural, industrial and mineral production.
- ii) Better marketing.
- iii) Promoting health and educational levels.
- iv) Improved employment opportunities.
- v) Increasing income through inter and intrazonal trade.

The points discussed above are more viable for development of rural sector, which in our country, mainly means development of rural areas through better transportation.

What happens when transport is improved in the certain areas of a developing country has been illustrated with the help of a model. This model demonstrates the advantages of the construction of road infrastructure in these areas. As an example, construction of a new road, or even improved maintenance, would definitely bring about changes in the area. These changes are exemplified in figure-1. In this figure construction is seen as leading to increased road use and off farm employment (link 1,2). The increased road use in turn provides greater access to off farm employment, market, health and education (links 3,4,5, and 6 respectively), although this might depend on the increased availability of medical and educational personnel since these personnel would be able to reach these villages due to the transport development. The greater road use brings about mechanized transport in action which also increases off farm employment not shown in the figure. The off farm employment improves market, health and education facility and they in turn improve income, health and education level respectively (links 7,8,9, and 10). Improved and newly exploited resources will increase the national and regional income (link 11) and additional income has impact on health and education level (links 12 and 13). Education and health levels increase the off farm employment and off farm employment inspires better health and education (links 14,15,).

Not shown in the figure are the changes over time in the levels of various impacts. Some naturally occur fairly rapidly, while others take years to develop. For example construction of surfaced link road can change the whole pattern of farm life. The easy and cheap transport services would motivate the farmers to grow cash crops and perishables. The agricultural produce transported to the nearest industrial town as an input would in turn increase the industrial production.

Transport Model



3. Economic Development

Transportation is a key factor in economic development. It connects rural areas to urban centers, enabling the flow of goods and services. Improved transport infrastructure can stimulate economic growth by reducing costs and increasing market access. This is particularly important for agricultural regions, where it allows farmers to reach larger markets and diversify their production. Additionally, better transport services can attract investment and create jobs, leading to a more vibrant and sustainable economy.

## CHAPTER - III

### Impact of Transport

#### 3.1 Agriculture

The most serious result of poor transportation in agricultural areas of developing countries is that farmers are not able to introduce more efficient farming methods and new techniques. Suppliers of agricultural machinery, tools, spare parts and maintenance labour may be unable to deliver modern equipment because of the lack of accessibility. Furthermore, poor transportation prevents farmers from receiving their supply of seeds, fertilizer and equipment necessary for growing crops and makes the market inaccessible for the produced crop. Wilfred Owen suggests, for the sake of boosting agriculture, that transportation should be linked to agriculture by increasing farm-to-market roads.

The ratio of kilometres of road per square kilometres cultivated area in Pakistan is 0.3:1. In agriculturally advanced western countries, this ratio varies between 3:1 and 4:1. Saudi Arabia has very high ratio of 6:1. In Britain, France, Japan and the United States, the ratio is about 4 : 1. In Malaysia it is about 0.75 : 1 and in the Philippines 1 : 1. In India, the ratio is only about two-thirds of a kilometre to one square kilometre of cultivated land but it is still better than Pakistan. Statistics indicates that a certain minimum density of farm-to-market roads is present when rural development has achieved high levels and that none of the poor countries have reached enough kilometreage.

#### 3.2 Price Level

An important role played by transportation in economy is the stabilization of prices of different goods in different markets and regions, within limit of the freight charges.

In the absence of transportation, a shortage of a commodity in one area would cause its price to go up, while abundance of that particular commodity in another area may tend to depress its price, until the effective demand and the available supply meet. The ability to move goods from places where there is plenty to places where there is scarcity tends to stabilize the prices of the same commodity in both areas through increasing the supply in the latter areas and decreasing it in th former, at least within the range of prices created by varying transportation charges.

#### 3.3 Economic Development

Transportation is closely related to many aspects of economic development, but it is not clear how intensively

developing countries should invest in transportation. Economic development requires adequate and effective transportation service. However, at the specified stage of development of an economy a theoretically optimum amount of transport capacity is generally accepted. Nonetheless, agreement on the determination of these capacities and their implied rate of investment is far from unanimous.

The role of transportation is not completely unambiguous. Rather than being autonomous, it is always a part of something else. Without resources to be utilized, access has no meaning. Investment in transportation may be contingent upon the fact that it is already being provided, but as Hans Heymann has pointed out "There is no assurance that this fact will necessarily call forth investment". In some sense transport may be a neutral factor. It needs to be related to what it is going to be used for, and who is going to use it before any development and investment can take place. Transportation is rarely desired for itself; it is really a means to serve other objectives.

Investment in transportation could be a catalyst for economic development. Transportation improvements alone cannot produce economic growth, though in a suitable environment they can be the missing agent. Furthermore, over commitment of scarce resources to transportation can strangle development hopes as quickly as, insufficient transportation facilities might jeopardize other sectors of the economy. There is a wisdom in calling for balancing the investment for transportation rather than intensively investing in a single sector. Albert O. Hirschman calls for a balanced strategy of development both in terms of sectors and regions. He argues that an unbalanced strategy may generate pressures and disequilibrium.

An unbalanced transport strategy can be either overcapitalization or undercapitalization in transport investment. Both are undesirable. A balanced transport strategy is viewed by Mahayni

"...as an attempt to establish an equilibrium between transport demands and transport supply. Transportation investments are only made according to the levels of existing and forecasted traffic demands, and the timing of such investment will be phased according to the rate of growth in traffic".

Apart from the economic consideration, transportation plays an important social and political role. Immobility is very closely related to poverty, whereas mobility is associated with better health and education, the discovery and use of resources, greater industrialization, better organization and administration, and a willingness to accept new ideas.

Perhaps the most important socio-political effect of transportation is in stimulating the spread of information and new ideas and the desire to take advantage of the material progress which specialization makes possible. Historically, transportation has played a very important role in communication. Transportation and Communication were the same, because communication was possible only through the transportation of a message.

According to Choudhury, the spread of religious and political ideologies and other cultural forms in Developing countries is directly dependent upon the development of transportation facilities. The improved transportation enables villagers to obtain the daily and weekly newspapers regularly and to communicate their ideas and thoughts with fellow countrymen living in distant villages.

From the political standpoint, transportation makes it possible for large geographical areas to be unified. Cultural similarity, mutual understanding and the economic interdependence, brought about by large inter-regional trade, reduce tendencies toward isolation, while the ability to communicate rapidly makes unification administratively feasible. The centres of government must have continuous and relatively rapid communication with people and the tendencies they govern.

Transportation facilities with their wide coverage of the economy have a wider impact on the economy. Investment for transportation rather than (alternatively) investing in a single sector. After all, investment in a single sector of development has to be seen in terms of a balanced strategy of development. It is not enough to have a few roads and railways. The roads and railways must be connected with the rest of the country.

An important aspect of transport strategy can be seen in the development of a transportation system. Both are interdependent. A balanced transport strategy is based on the following factors:

"... as a strategy to establish an equilibrium between transport and economic growth. Transportation investment is only made according to the level of existing and potential traffic demands and the timing of such investment is a function of the growth rate of the economy."

Transportation is a key factor in economic development. It plays an important role in the growth of a country, especially in the case of a developing country, where the level of investment in transport is very low. The level of investment in transport is a function of the growth rate of the economy. The level of investment in transport is a function of the growth rate of the economy. The level of investment in transport is a function of the growth rate of the economy.



## CHAPTER - IV

### Analysis of Data

#### 4.1 The Model - Regression Analysis

In order to test the strength of relationship between development of socio-economic indicators and road development indicators, regression analysis was carried out. The road development indicators were taken as independent variables, while other socio-economic indicators were taken as dependent variables.

Time series (1973 - 1990) development of agricultural crops including fruits and perishables, and socio-economic indicators such as health and education were regressed on road development rural as well as intercity roads, in linear and log forms using equations;

$$y = a + bx \text{ and } y = ax .$$

#### 4.2 Development Indicators

A set of development indicators relating to different areas of development were identified. The value of indicators were obtained for each of the four provinces from national/provincial publications and from various offices concerned with the development of these sectors. The indicators are detailed as below.

##### Agricultural Indicators:

- i) Production of Agricultural crops.
- ii) Production of fruits.
- iii) Percentage of gross cropped area to net sown area.
- iv) Percentage of gross cropped area to total area.
- v) Percentage of villages having cottage industries.

##### Demographic Indicators

- i) Percentage of literate males.
- ii) Percentage of literate female.

##### Health Indicators:

- i) Number of Hospitals.
- ii) Number of doctors per 10,000 population.
- iii) Percentage of villages having maternity and child welfare centres.

##### Educational Indicators:

- i) Number of schools per 10,000 population.
- ii) Percentage of villages having primary schools.
- iii) Enrolment in Primary schools.
- iv) Teaching staff.

Social Services Indicators:

- i) Percentage of villages with power supply.
- ii) Percentage of villages with water supply.
- iii) Percentage of villages having post office.

Transport Indicators:

- i) Total road length per Sq.Km of area.
- ii) Total road length per 10,000 population.
- iii) Surfaced road length per Sq.Km of area.
- iv) Surfaced road length per 10,000 population.

4.3 Data Analysis

The data collected for various development indicators are placed in Annexure I to XI. The co-efficient of variation for each sector were calculated and are presented in tables 1 to 5. Majority of indicators (19 out of 25) have a co-efficient of variation less than 0.50 which shows that variation among the areas in respect of development is not significant.

4.4 Discussion

The results are shown in tables 6-17. In all forms, the indicators look quite related with road development. Among all these cases, 73% of the combinations have R Square more than 0.50. It may be interesting to note that perishables like citrus fruits, banana, guava, and apple whose producers were not in a position to explore enough markets for their produce and if grown in abundance were used to be rotten in the absence of access roads. According to the analysis these indicators have higher R Square values than the other crops like cotton and rice. This shows that the production of these perishables appears to have been encouraged with the development of road.

This discussion is also relevant to the Von Thunen ideas about location theory, first published in *Der Isolierte Stat* (The isolated State) in 1826. He recognized that the differences in the cost of producing agricultural products result from utilization of land of different quality and location i.e., distance from a central selling point. At the same time he recognized that those products which are bulky in relation to value are more costly to transport than those which are less so and that some farm products cannot stand as long period in transit because of their perishability. According to the assumptions of location theory production of certain crop depends upon costs involved in the production and its transportation to the market place.

This theory also recommends that commodities requiring transport are grown near to the means of communication. As the distance of a place near road increases, composition of goods produced changes in form of

goods required less transport. Thus spatial behavior is achieved.

#### 4.5 X Coefficients

The signs of Coefficients are correct with few exceptions like cotton in NWFP, Apple and Guava in Sind. The negative Coefficients are constant in such cases is due to negligible quantities of the respective crops compared to other areas.

It would not be out of place to mention here that education sector especially the most sensitive one i.e., the female education has shown better relationship with road development than any other sector where R Square is never less than 0.9.

#### 4.6 "t" Test

To test the hypothesis in more sophisticated manner that socio-economic development is also dependent upon road, 't' test; was applied i.e.,  $t = \frac{b}{sb}$  where;

$$Sb = \sqrt{\frac{\sum (Y_i - Y_{ic})^2}{(n-2) \sum (X_i - \bar{X})^2}}$$

From the results it can be seen that calculated value of 't' is much higher than the tabulated value both at 1% and 5% level of significance. This approves our hypothesis that development keeping other factors constant is dependent on road.

Hence there is sufficient reason to conclude that road has positive impact on the development.

From the above analysis, it could be seen that an increase in road density rural as well as intercity have direct impact on all sectors of economy. The improvement in accessibility levels would help in the socio-economic development of any area.

Table-1  
Agricultural Indicators  
Yield per hectare of Major Agricultural crops (Kgs)

S.No.	Region	Wheat	Rice	Maize	Cotton	Sugarcane
1.	Punjab	1856	1156	1329	681	37354
2.	Sind	2039	2044	490	357	46684
3.	NWFP	1319	1854	1487	276	43175
4.	Baluchistan	1902	2618	933	525	47200
	Mean (M)	1788	1840	1128	490.8	43027
	Standard Deviation (SD)	245.71	492.40	338.49	141.92	3696.34
	Co-efficient of variation = SD/M	0.137	0.238	0.300	0.289	0.086

Table-2  
Demographic Indicators  
Literacy Ratio

S.No.	Area	Total		Urban		Rural		
		Both Sexes	Male	Both Sexes	Male	Both Sexes	Male	Female
1.	Punjab	27.4	36.8	46.7	55.2	20.0	29.6	9.4
2.	Sind	31.5	39.7	50.8	57.8	15.6	24.5	5.2
3.	NWFP	16.7	25.9	35.8	47.0	13.2	21.7	3.8
4.	Baluchistan	10.3	15.2	32.2	42.4	6.2	9.8	1.8
	Mean (M)	22.42	30.54	42.5	51.54	14.46	22.36	5.5
	Standard Deviation (SD)	7.76	8.930	7.19	5.846	4.688	6.781	7.024
	Co-efficient of Variation = SD/M	0.346	0.292	0.169	0.113	0.324	0.303	1.277



**Table-5**  
**Transport Indicators**

S.No.	Area	Road Km per 100 Sq Km of Area	Road Km per 10000 Popula	Surfaced Rd. per 100 SqKm Of Area	Surfaced Rd. per 10,000 Population
1.	Punjab	31.48	10.32	21.52	7.05
2.	Sind	37.87	21.11	20.95	11.68
3.	NWFP	27.79	27.93	10.90	5.56
4.	Baluchistan	8.79	55.11	10.33	8.32
	<b>Mean (M)</b>	<b>25.48</b>	<b>25.94</b>	<b>13.12</b>	<b>8.07</b>
	<b>Standard Deviation (SD)</b>	<b>9.895</b>	<b>15.725</b>	<b>7.992</b>	<b>2.026</b>
	<b>Co-efficient of variation = SD/M</b>	<b>0.388</b>	<b>0.606</b>	<b>0.571</b>	<b>0.251</b>

Area	Area (Sq Km)	Population	Road Km	Surfaced Rd. Km	Road Km per 10000 Popula	Surfaced Rd. per 100 SqKm Of Area	Surfaced Rd. per 10,000 Population
Punjab	59,146	10,000,000	18,540	12,500	31.48	21.52	7.05
Sind	138,147	5,000,000	52,100	28,800	37.87	20.95	11.68
NWFP	79,710	28,000,000	22,000	10,000	27.79	10.90	5.56
Baluchistan	34,719	3,000,000	300	350	8.79	10.33	8.32
<b>Total</b>	<b>186,722</b>	<b>26,000,000</b>	<b>70,840</b>	<b>51,650</b>	<b>25.48</b>	<b>13.12</b>	<b>8.07</b>
<b>Standard Deviation (SD)</b>					<b>9.895</b>	<b>7.992</b>	<b>2.026</b>
<b>Co-efficient of variation = SD/M</b>					<b>0.388</b>	<b>0.571</b>	<b>0.251</b>

Table-6  
Results of Regression Analysis  
Dependent Variable: Production of Cotton

No. of observations: 18  
Degrees of Freedom: 16

Province	Independent Variable	Constant	Standard Error Of Y Estimated	R Square	X Coefficient (S)	Standard Error of Coefficient
Punjab	All Weather Rural Roads	847.8651	1349.051	0.623384	0.664322	0.129089
	"	1211.583	218.6970	0.017484	0.073947	0.138580
Baluchistan	"	3.376292	0.385003	0.483427	0.00168	0.000435
	"	0.254488	0.466045	0.138980	0.003101	0.0001930
Sind	"	1.3097	0.1824	0.4257	0.6178	0.1794
	"	2.8920	0.0771	0.0747	0.0750	0.0660
Baluchistan	"	0.8594	0.0718	0.3723	-0.1725	0.0560
	"	-2.2811	0.3239	0.2193	0.9505	0.4483
Punjab	All Weather Intercity Rds	-1286.45	1275.021	0.663566	0.346400	0.061663
	"	1128.451	216.0410	0.041204	0.017356	0.020930
Baluchistan	"	4.210600	0.368181	0.527582	-0.000033	0.000079
	"	-0.37685	0.449806	0.197936	0.0000356	0.000179
Punjab	"	-1.6386	0.1664	0.5220	0.2445	0.2977
	"	2.5639	0.0771	0.0736	0.1377	0.1222
Baluchistan	"	2.2895	0.0654	0.4793	-0.5131	0.1337
	"	7.4340	0.3109	0.2803	2.0645	0.8270

Province: Punjab, Baluchistan, Sind  
Independent Variable: All Weather Rural Roads, All Weather Intercity Rds  
Constant: 847.8651, 1211.583, 3.376292, 0.254488, 1.3097, 2.8920, 0.8594, -2.2811, -1286.45, 1128.451, 4.210600, -0.37685, -1.6386, 2.5639, 2.2895, 7.4340  
Standard Error Of Y Estimated: 1349.051, 218.6970, 0.385003, 0.466045, 0.1824, 0.0771, 0.0718, 0.3239, 1275.021, 216.0410, 0.368181, 0.449806, 0.1664, 0.0771, 0.0654, 0.3109  
R Square: 0.623384, 0.017484, 0.483427, 0.138980, 0.4257, 0.0747, 0.3723, 0.2193, 0.663566, 0.041204, 0.527582, 0.197936, 0.5220, 0.0736, 0.4793, 0.2803  
X Coefficient (S): 0.664322, 0.073947, 0.00168, 0.003101, 0.6178, 0.0750, -0.1725, 0.9505, 0.346400, 0.017356, -0.000033, 0.0000356, 0.2445, 0.1377, -0.5131, 2.0645  
Standard Error of Coefficient: 0.129089, 0.138580, 0.000435, 0.0001930, 0.1794, 0.0660, 0.0560, 0.4483, 0.061663, 0.020930, 0.000079, 0.000179, 0.2977, 0.1222, 0.1337, 0.8270

No. of observations: 18  
Degrees of Freedom: 16

Table-7  
Results of Regression Analysis  
Dependent Variable: Production of Rice

No. of observations: 18  
Degrees of Freedom: 16

Province	Independent Variable	Constant	Standard Error of Y Estimated	R Square	X Coefficient (S)	Standard Error of Coefficient
Punjab	All weather rural roads	1255.918	275.021	0.663566	0.028306	0.016396
	"	128.451	16.0410	0.041204	0.101195	0.104153
	"	0.2106	0.368181	0.527582	0.057395	0.013915
Baluchistan	"	0.37685	0.449806	0.197936	1.387792	0.424817
	"	2.6661	0.0510	0.2996	0.1311	0.0501
	"	3.0067	0.0539	0.0630	0.0478	0.0461
Baluchistan	"	1.4800	0.0447	0.7100	0.2183	0.0349
	"	-1.7725	0.2945	0.5591	1.8360	0.4076
	"	-140.512	70.39165	0.824178	0.029482	0.003404
Sind	All weather Intercity Rds	1176.259	154.0198	0.170856	0.027094	0.014921
	"	52.18492	10.56065	0.642983	0.012249	0.002281
	"	27.64242	8.367463	0.775873	0.024824	0.003335
Baluchistan	"	2.2951	0.0539	0.2167	0.2029	0.0964
	"	2.4942	0.0490	0.2237	0.1669	0.0777
	"	-0.0855	0.0430	0.7320	0.5816	0.0880
Baluchistan	"	12.4659	0.2017	0.7932	4.2017	0.5363

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Table-8  
Results of Regression Analysis  
Dependent Variable: Production of Wheat

No. of observations: 18  
Degrees of Freedom: 16

Province	Independent Variable	Constant	Standard Error Of Y Estimated	R Square	X Coefficient (S)	Standard Error of Coefficient
Linear Punjab	All weather rural roads	47.8651	349.051	0.623384	0.576582	0.068480
Sind	"	211.583	18.6970	0.017484	0.814096	0.174115
NWFP	"	0.376292	0.385003	0.483427	0.592537	0.109501
Baluchistan	"	0.254488	0.466045	0.139990	2.347752	0.3727735
Log (e) Punjab	"	2.6135	0.0350	0.8575	0.3370	0.0343
Sind	"	2.4807	0.0738	0.5615	0.2861	0.0632
NWFP	"	2.3284	0.0393	0.8018	0.2466	0.0306
Baluchistan	"	-0.37527	0.1494	0.7212	1.3303	0.2068
Linear Punjab	All weather Intercity Rds	3662.233	835.0448	0.74928	0.279262	0.040384
Sind	"	745.7327	191.0755	0.795648	0.146112	0.018512
NWFP	"	356.7739	84.53848	0.728907	0.119808	0.018266
Baluchistan	"	-446.283	51.28574	0.906671	0.254889	0.020444
Log (e) Punjab	"	1.4672	0.0440	0.7734	0.5821	0.0788
Sind	"	0.7182	0.0404	0.8685	0.6587	0.0641
NWFP	"	0.6213	0.0410	0.7846	0.6395	0.0838
Baluchistan	"	-7.5440	0.0813	0.9136	2.8770	0.2212

Source: Government of Punjab, Department of Agriculture, Lahore, 1964.

Table-9  
Results of Regression Analysis

Dependent Variable: Production of Citrus Fruits

No. of observations: 18  
Degrees of Freedom: 16

Province	Independent Variable	Constant	Standard Error of Y Estimated	R Square	X Coefficient (S)	Standard Error of Coefficient
Linear Punjab	All weather rural roads	323.0467	103.2438	0.928397	0.142298	0.009879
Sind	"	29.30252	3.278500	0.281401	0.005200	0.002077
NWFP	"	19.24873	3.090833	0.647938	0.018967	0.003495
Baluchistan	"	0.65256	0.394198	0.900586	0.019656	0.001632
Log (e) Punjab	"	0.4204	0.0396	0.9534	0.7049	0.0390
Sind	"	1.2363	0.0481	0.2735	0.1010	0.0412
NWFP	"	0.7298	0.0484	0.7712	0.2772	0.0378
Baluchistan	"	0.7298	0.0484	0.7712	0.2772	0.0378
Linear Punjab	All weather Intercity Rds	-43.5171	156.8693	0.834699	0.068192	0.007586
Sind	"	24.53422	2.705233	0.510733	0.001071	0.000262
NWFP	"	9.294487	2.546484	0.761026	0.003927	0.000550
Baluchistan	"	-3.45756	0.463174	0.862752	0.001851	0.000184
Log (e) Punjab	"	-2.6108	0.0911	0.8784	1.3555	0.1261
Sind	"	10.4570	0.0363	0.5850	0.2735	0.0576
NWFP	"	-1.2772	0.0445	0.8065	0.7433	0.0910
Baluchistan	"	-8.8549	0.0858	0.8923	2.6250	0.2279

Dependent Variable: Production of Citrus Fruits

Dependent Variable: Production of Citrus Fruits

Table-10  
Results of Regression Analysis  
Dependent Variable: Production of Mango

No. of observations: 18  
Degrees of Freedom: 16

Province	Independent Variable	Constant	Standard Error Of Y Estimated	R Square	X Coefficient (S)	Standard Error of Coefficient
Linear Punjab	All weather rural roads	332.0255	115.893958	0.101545	0.014913	0.011090
Sind	"	244.112278	13.2232880	0.1793805	0.015670	0.008379
NWFP	"	0.858754	0.2910751	0.542981	0.001434	0.000329
Baluchistan	"	1.698647	0.540422	0.754288	0.015686	0.002238
Log (e) Punjab	"	1.9518	0.1084	0.1464	0.1767	0.1066
Sind	"	2.3019	0.0237	0.1781	0.0377	0.0203
NWFP	"	-1.0083	0.1274	0.5713	0.4585	0.0993
Baluchistan	"	-0.7608	0.0625	0.7699	0.6328	0.0865
Linear Punjab	All weather Intercity Rds	292.9286	116.47894	0.092452	0.007191	0.005633
Sind	"	225.16242	10.6641841	0.466274	0.003862	0.001033
NWFP	"	0.078482	0.24819512	0.6675841	0.000303	0.000053
Baluchistan	"	-1.02483	0.35721141	0.8926478	0.001642	0.000142
Log (e) Punjab	"	1.2140	0.1079	0.1550	0.3306	0.1930
Sind	"	1.9110	0.0165	0.5998	0.1282	0.0262
NWFP	"	-4.4991	0.1159	0.6448	1.2773	0.2370
Baluchistan	"	-3.9827	0.0413	0.8994	1.3142	0.1099

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Table-11  
Results of Regression Analysis  
Dependent Variable: Production of Apple

No. of observations: 18  
Degrees of Freedom: 16

Province	Independent Variable	Constant	Standard Error of Y Estimated	R Square	X Coefficient (S)	Standard Error of Coefficient
Linear Punjab	All weather rural roads	0.4485	1.04509	0.8327	0.00089	0.00010
Sind	"	0.2126	0.0238	0.0403	-0.00001	0.000015
NWFP	"	17.5574	8.91686	0.9039	0.12373	0.010084
Baluchistan	"	-2.9030	10.48438	0.88989	0.4938	0.04342
Log (e) Punjab	"	-2.3212	0.1300	0.7157	0.8117	0.1279
Sind	"	-0.6035	0.0417	0.0481	-0.0321	0.0357
NWFP	"	-0.1725	0.1279	0.7916	0.7772	0.0997
Baluchistan	"	-0.6974	0.0810	0.8721	1.1702	0.1121
Linear Punjab	All weather Intercity Rds	-2.3653	0.91058	0.87297	0.00046	0.000044
Sind	"	0.22847	0.02287	0.113799	-0.0000	0.00000
NWFP	"	-40.253	8.2376	0.918	0.0238	0.0018
Baluchistan	"	-79.795	8.09415	0.9344	0.0487	0.00323
Log (e) Punjab	"	-5.7143	0.1210	0.7579	1.5196	0.2147
Sind	"	-0.2652	0.0391	0.1662	-0.1106	0.0619
NWFP	"	-5.8666	0.1110	0.8429	2.1027	0.2270
Baluchistan	"	-6.4070	0.0456	0.9594	2.3584	0.1212

Table-12  
Results of Regression Analysis  
Dependent Variable: Production of Banana

Province	Independent Variable	Constant	Standard Error of Y Estimated	R Square	X Coefficient (S)	Standard Error of Coefficient
Linear Punjab	All weather rural roads	3.141666	2.192222	0.631321	0.001098	0.000209
Sind	"	82.03324	15.06754	0.802382	0.076955	0.009547
NWFP	"	7.608814	2.034764	0.100003	0.003068	0.002301
Baluchistan	"	0.25848	0.197949	0.506123	0.003318	0.000819
Log (e) Punjab	"	-1.7943	0.1381	0.6490	0.7388	0.1358
Sind	"	1.2966	0.0601	0.6751	0.2967	0.0515
NWFP	"	0.5521	0.1220	0.1398	0.1533	0.0951
Baluchistan	"	-1.8995	0.1282	0.5701	0.8177	0.1775
Linear Punjab	All weather Intercity Rds	0.171168	2.317200	0.588086	0.000535	0.000112
Sind	"	41.07165	15.16309	0.799868	0.011747	0.001469
NWFP	"	6.105501	2.026046	0.107628	0.000608	0.000437
Baluchistan	"	-0.42564	0.145894	0.731721	0.000384	0.000058
Log (e) Punjab	"	-4.4553	0.1494	0.5889	1.2803	0.2674
Sind	"	-0.13411	0.0526	0.7514	0.5796	0.0834
NWFP	"	-0.5488	0.1218	0.1432	0.4069	0.2488
Baluchistan	"	-6.5115	0.0935	0.7716	1.8278	0.24862

Table-13  
Results of Regression Analysis  
Dependent Variable: Production of Guava

No. of observations: 18  
Degrees of Freedom: 16

Province	Independent Variable	Constant	Standard Error of Y Estimated	R Square	X Coefficient (S)	Standard Error of Coefficient
Linear Punjab	All weather rural roads	6.0094	30.4894	0.8971	0.0344	0.0029
Sind	"	17.8922	7.5475	0.0050	-0.00135	0.0048
NWFP	"	11.1046	1.9132	0.83639	0.1957	0.0022
Baluchistan	"	0.4738	0.1195	0.8945	0.0058	0.0005
Log (e) Punjab	"	-1.2384	0.0817	0.8957	0.9419	0.0804
Sind	"	1.0983	0.1547	0.0058	0.0404	0.1343
NWFP	"	0.3645	0.0493	0.8444	0.3582	0.0385
Baluchistan	"	-1.3245	0.0403	0.9004	0.6708	0.0558
Linear Punjab	All weather Intercity Rds	-91.5006	35.00448	0.8643	0.0171	0.0017
Sind	"	21.2706	7.4195	0.0385	-0.00058	0.00072
NWFP	"	1.8843	1.7808	0.8582	0.0038	0.0004
Baluchistan	"	-0.4256	0.0890	0.9414	0.0006	0.0000
Log (e) Punjab	"	-4.8274	0.0944	0.8606	1.6795	0.1689
Sind	"	1.7643	0.1534	0.0219	-0.1456	0.2432
NWFP	"	-2.1120	0.0519	0.8279	0.9301	0.1060
Baluchistan	"	-4.4790	0.0310	0.9411	1.3177	0.0824

NO. OF OBSERVATIONS: 18  
DEGREES OF FREEDOM: 16

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Table 14  
Results of Regression Analysis

No. of observations: 18  
Degrees of Freedom: 16

Province	Dependent Variable	Independent Variable	Constant	Standard Error of Y Estimated	R Square	X Coefficient (S)	Standard Error of Coefficient
Linear Punjab	Hospitals	All weather rural roads.	225.4034	4.0638	0.8366	0.0035	0.0004
Sind	"	"	115.9020	26.5374	0.7542	0.1178	0.0168
NWFP	"	"	137.7547	2.7663	0.7742	0.0232	0.0031
Baluchistan	"	"	18.8776	4.0337	0.7802	0.1260	0.0167
Log (e) Punjab	"	"	0.8493	0.0316	0.4532	0.3056	0.0840
Sind	"	"	1.2068	0.0730	0.7088	0.3892	0.0625
NWFP	"	"	2.0452	0.0080	0.7946	0.0485	0.0062
Baluchistan	"	"	0.5108	0.0416	0.8210	0.4934	0.0576
Linear Punjab	Dispensaries	"	1249.184	58.1775	0.2193	-0.0118	0.0056
Sind	"	"	894.1894	129.5886	0.7805	0.6193	0.0821
NWFP	"	"	541.3271	57.2357	0.0548	0.0624	0.0647
Baluchistan	"	"	387.6219	36.7984	0.4435	-0.5442	0.1524
Log (e) Punjab	"	"	3.2025	0.0221	0.1395	-0.0350	0.0217
Sind	"	"	2.2895	0.0492	0.7595	0.2986	0.0421
NWFP	"	"	2.6225	0.0439	0.1266	0.0521	0.0342
Baluchistan	"	"	3.0318	0.0478	0.4865	-0.2574	0.0661

Table-15  
Results of Regression Analysis

No. of observations: 18  
Degrees of Freedom: 16

Province	Dependent Variable	Independent Variable	Constant	Standard Error Of Y Estimated	R Square	X Coefficient	Standard Error Of Coefficient
Linear Punjab	M.C.H	All weather rural roads.	466.8136	25.8236	0.0006	-0.0000	0.0025
Sind	"	"	116.8893	6.3230	0.7684	0.0292	0.0040
NWFP	"	"	40.5735	36.1991	0.8289	0.3604	0.4094
Baluchistan	"	"	36.9901	3.8593	0.7940	0.1255	0.0160
Log (e) Punjab	"	"	2.6221	0.0238	0.0184	0.0128	0.0234
Sind	"	"	1.7762	0.0302	0.7832	0.1303	0.0171
NWFP	"	"	2.6225	0.0439	0.1266	0.0521	0.0342
Baluchistan	"	"	1.0347	0.0285	0.8121	0.3286	0.0395
Linear Punjab	Hospital Beds	"	14433.84	1414.815	0.9198	1.8343	0.1354
Sind	"	"	10733.52	1811.845	0.7617	8.2102	1.1481
NWFP	"	"	6145.544	666.7936	0.8559	7.3506	0.7541
Baluchistan	"	"	1435.351	206.7252	0.8518	8.2111	0.8562
Log (e) Punjab	"	"	3.0172	0.0231	0.9432	0.3703	0.0227
Sind	"	"	1.7762	0.0300	0.7832	0.1303	0.0171
NWFP	"	"	3.2382	0.0213	0.9484	0.2845	0.0166
Baluchistan	"	"	2.4152	0.0324	0.8720	0.4686	0.0449



Table-16  
Results of Regression Analysis

No. of observations: 18  
Degrees of Freedom: 16

Linear.

Dependent Variable	Independent Variable	Constant	Standard Error of Y Estimated	R Square	X Coefficient (S)	Standard Error of Coefficient
<u>Primary Schools</u>	All weather rural roads.					
Total	"	24109.38	3829.061	0.8723	7.3506	0.7541
Female	"	947.9087	1572.056	0.9785	2.5760	0.0955
<u>Teachers</u>	"					
Total	"	79.8388	2058.683	0.9631	325.3558	15.9258
Female	"	2295.231	2584.053	0.9418	963.3168	59.8506
<u>Enrolment (Primary)</u>	"					
Total	"	3030.277	1937.866	0.9673	7.8292	0.3599
Female	"	11445.15	1262.083	0.9861	20.2945	0.6018
<u>Primary Schools</u>	All weather intercity Rds					
Total	"	10688.01	5014.961	0.8741	0.5219	0.0495
Female	"	-19671.5	2279.559	0.9740	3.3898	0.1385
<u>Teachers</u>	"					
Total	"	-19710.3	3802.640	0.9776	421.1547	29.4169
Female	"	-17293.0	3996.392	0.9200	1255.793	92.5625
<u>Enrolment</u>	"					
Total	"	-16722.8	2945.620	0.9565	10.2691	0.5471
Female	"	-5648.96	2286.604	0.9738	26.6003	1.0904

Table-17  
Results of Regression Analysis

No. of observations: 18 Degrees of Freedom: 16		Log(e).				
Dependent Variable	Independent Variable	Constant	Standard Error of Y Estimated	R Square	X Coefficient (S)	Standard Error of Coefficient
Primary Schools	All weather rural roads.					
Total	"	-2.5298	0.0764	0.7661	1.5615	0.2157
Female	"	-0.4009	0.0143	0.9745	0.9961	0.0403
Teachers	"					
Total	"	-2.4825	0.0193	0.9543	0.9935	0.0544
Female	"	-3.0776	0.0276	0.9135	1.0156	0.0781
Enrolment (Primary)	"					
Total	"	-0.9968	0.0190	0.9572	1.0162	0.0537
Female	"	-2.7269	0.0165	0.9792	1.2775	0.0465
Primary Schools	All weather intercity Rds					
Total	"	-0.1802	0.0821	0.7295	1.0735	0.1634
Female	"	1.0208	0.0146	0.9734	0.7013	0.0290
Teachers	"					
Total	"	-1.0315	0.0231	0.9340	0.6923	0.0460
Female	"	-1.6044	0.0298	0.9000	0.7099	0.0593
Enrolment (Primary)	"					
Total	"	0.4770	0.0220	0.9427	0.7103	0.0438
Female	"	-0.8867	0.0197	0.9702	0.2957	0.0392

Table-18  
Student 't' Test

Hypothesis Ho: Y is dependent on X.

X	Y	D.F	Value of 't'		Result
			Calculated	Tabulated At 1% Level At 5% Level	
1. Road	Primary Schools (Male)	16	10.68	2.583 1.746	HO Accepted
2. Road	Primary Schools (Female)	16	33.040	2.583 1.746	" "
3. Road	Teachers (Male)	16	6.325	2.583 1.746	" "
4. Road	Teachers (Female)	16	21.125	2.853 1.746	" "
5. Road	Enrolment (Male)	16	21.722	2.583 1.746	" "
6. Road	Enrolment (Female)	16	9.876	2.583 1.746	" "

All Weather Rural Roads (Kms)

Year	Punjab 1	Sind 2	NWFP 3	Baluchistan 4
1973	1,731	279	92	73
1974	1,886	261	101	81
1975	2,078	276	103	82
1976	2,130	287	110	83
1977	2,491	268	114	92
1978	2,580	261	119	101
1979	2,988	219	141	101
19780	3,038	227	178	111
1981	3,658	262	215	111
1982	4,572	459	276	113
1983	4,723	557	298	113
1984	5,813	658	301	106
1985	6,367	729	323	147
1986	6,904	808	367	197
1987	7,442	986	552	222
1988	8,100	1122	596	223
1989	8,768	1261	711	234
1990	9,101	1321	729	234

All Weather Intercity Roads (Kms)

Year	Punjab 5	Sind 6	NWFP 7	Baluchistan 8
1973	9,964	3,751	2,574	2,067
1974	10,169	3,830	2,627	2,110
1975	10,025	4,460	2,758	2,305
1976	10,388	4,945	2,901	2,345
1977	11,398	5,260	3,036	2,393
1978	11,874	5,612	3,274	2,431
1979	12,186	6,040	3,520	2,540
1970	12,246	6,330	3,532	2,811
1981	12,600	6,928	3,593	2,954
1982	13,202	7,206	3,891	2,836
1983	13,944	7,427	3,980	2,891
1984	16,057	7,748	4,057	3,431
1985	17,110	8,083	4,295	3,500
1986	18,393	8,613	4,807	3,549
1987	20,699	9,513	4,974	3,549
1988	22,053	10,466	5,099	3,686
1989	23,854	11,356	6,153	3,745
1990	25,339	12,281	6,271	3,854

## Annexure-II

## Production of Agricultural Crops

Year	Punjab 9	Sind 10	NWFP 11	Baluchistan 12
Wheat (000 Tonnes)				
1973	5693.5	1095.8	584.4	68.6
1974	5664.8	1246.0	606.9	111.2
1975	5785.6	1143.6	613.2	131.1
1976	6571.3	1320.9	660.4	138.8
1977	6807.7	1478.6	711.6	146.0
1978	6090.2	1427.0	688.6	161.4
1979	7323.6	1680.1	737.5	208.8
1970	7613.5	1849.4	862.5	231.1
1981	8350.0	1945.8	940.8	238.0
1982	7962.1	2061.7	962.2	318.2
1983	8935.1	2066.7	998.4	414.2
1984	7622.8	1945.8	859.8	453.5
1985	8315.1	2078.7	872.1	437.1
1986	10431.6	2172.2	906.5	412.7
1987	8334.3	2211.5	959.4	510.7
1988	9203.8	2180.4	899.2	391.7
1989	10517.0	2360.6	1003.7	537.9
1990	10518.2	2130.9	1102.1	564.3

## Production of Agricultural Crops

Year	Punjab 13	Sind 14	NWFP 15	Baluchistan 16
Rice (000 Tonnes)				
1973	1000.9	1221.9	66.0	40.9
1974	1114.5	1235.0	72.2	33.4
1975	1152.4	1049.0	76.9	35.5
1976	1207.1	1286.1	84.6	39.6
1977	1332.0	1292.0	85.4	28.0
1978	1507.8	1315.3	87.6	38.9
1979	1765.9	1340.9	104.0	61.2
1970	1518.4	1499.1	104.7	93.6
1981	1361.7	1549.9	105.1	106.5
1982	1450.9	1584.2	110.7	283.9
1983	1407.0	1560.1	112.7	364.9
1984	1409.4	1478.8	115.8	335.5
1985	1534.1	1345.0	115.5	319.8
1986	1478.2	1071.7	113.8	255.2
1987	1534.8	1548.5	118.3	284.7
1988	1352.3	1537.5	107.5	243.6
1989	1367.3	1435.9	117.8	279.2
1990	1482.2	1340.0	114.6	283.3

## Annexure-III

## Production of Agricultural Crops

Year	Punjab 17	Sind 18	NWFP 19	Baluchistan 20
Cotton (000 Bales) of 378 lbs each				
1973	5954.1	1168.4	2.8	0.3
1974	2639.5	1228.3	3.2	0.7
1975	2587.8	1136.6	3.8	0.4
1976	2024.8	992.5	3.0	0.2
1977	1627.8	925.6	3.5	0.4
1978	2114.0	1263.0	2.9	0.1
1979	1941.9	838.0	2.6	0.1
1970	2831.6	1447.3	2.6	0.5
1981	2789.3	1406.9	2.8	2.0
1982	2844.2	1550.2	3.4	0.5
1983	3255.2	1584.5	3.3	0.9
1984	1694.2	1210.0	3.0	0.5
1985	4450.9	1475.6	3.0	0.9
1986	5701.2	1449.2	2.9	1.2
1987	6451.0	1304.6	2.8	1.3
1988	7255.4	1373.7	2.7	1.1
1989	7274.8	1108.0	1.8	0.5
1990	7454.2	1103.4	1.7	0.5
1991	8501.3	1124.6	1.3	0.5

## Production of Fruits

Year	Punjab 21	Sind 22	NWFP 23	Baluchistan 24
Citrus Fruits (000 Tonnes)				
1973	453.6	24.2	16.1	1.0
1974	516.3	30.6	14.7	0.9
1975	620.3	26.5	18.6	0.9
1976	625.7	25.1	19.4	0.9
1977	662.8	27.3	20.2	1.0
1978	565.0	34.5	22.5	1.1
1979	677.5	33.7	24.8	1.1
1970	810.0	34.0	25.5	1.1
1981	864.3	34.3	26.3	1.3
1982	1097.5	34.0	27.0	1.3
1983	1181.3	34.5	27.3	2.0
1984	1236.0	34.0	28.0	2.3
1985	1307.8	34.1	28.3	2.8
1986	1368.8	34.2	28.6	2.8
1987	1400.4	34.3	29.0	3.3
1988	1342.7	34.7	30.4	3.5
1989	1494.6	36.0	30.4	4.1
1990	1506.7	34.7	30.4	4.5

Production of Fruits

	Punjab 25	Sind 26	NWFP 27	Baluchistan 28
Mango (000 Tonnes)				
1970-71	320.1	197.1	-	2.0
1971-72	328.2	204.3	1.0	2.0
1972-73	329.4	220.4	0.4	2.0
1973-74	347.1	230.0	0.7	2.5
1974-75	777.9	223.6	0.6	2.6
1975-76	350.7	241.7	0.6	2.7
1976-77	318.3	256.5	1.3	2.8
1977-78	302.2	254.3	1.3	3.3
1978-79	273.8	259.8	1.4	3.5
1979-80	282.3	262.9	1.4	3.6
1980-81	273.9	267.4	1.5	3.8
1981-82	387.9	258.7	1.3	3.8
1982-83	417.3	259.6	1.4	4.3
1983-84	407.0	260.3	1.4	4.4
1984-85	429.0	257.1	1.5	4.3
1985-86	450.6	257.2	1.5	4.1
1986-87	470.3	260.3	1.6	4.4
1987-88	446.8	259.1	1.7	5.3
1988-89	467.6	260.2	1.7	5.5
1989-90	493.2	265.4	1.8	5.7

Production of Fruits

	Punjab 28	Sind 30	NWFP 31	Baluchistan 32
Banana (000 Tonnes)				
1970-71	1.2	74.3	12.9	0.2
1971-72	1.3	73.9	12.8	0.3
1972-73	4.3	88.8	10.6	0.3
1973-74	4.2	97.4	3.4	0.3
1974-75	3.2	104.3	8.9	0.3
1975-76	3.9	114.4	7.6	0.5
1976-77	2.8	103.6	9.7	0.5
1977-78	10.8	104.9	7.1	0.6
1978-79	11.0	111.4	7.5	0.6
1979-80	4.7	114.2	5.7	0.7
1980-81	5.8	117.5	6.8	0.7
1981-82	9.8	114.4	6.7	0.6
1982-83	9.5	112.0	11.8	1.1
1983-84	10.2	112.9	10.7	1.0
1984-85	10.7	114.4	10.8	0.8
1985-86	11.4	118.2	9.6	0.7
1986-87	10.6	181.7	9.0	0.9
1987-88	11.0	185.0	8.8	0.9
1988-89	12.0	182.9	9.3	1.0
1989-90	12.6	186.7	9.3	1.2

## Production of Fruits

	Punjab 33	Sind 34	NWFP 35	Baluchistan 36
Apple (000 Tonnes)				
1970-71	1.0	0.4	9.6	22.4
1971-72	1.3	0.3	9.7	24.9
1972-73	1.1	0.2	9.3	23.6
1973-74	2.7	0.3	18.7	29.8
1974-75	3.9	0.2	22.6	29.6
1975-76	3.4	0.2	30.7	32.5
1976-77	2.8	0.2	36.5	35.3
1977-78	3.1	0.2	42.1	42.3
1978-79	3.2	0.2	43.7	46.6
1979-80	3.1	0.2	45.6	50.4
1980-81	3.2	0.2	48.2	55.8
1981-82	2.7	0.2	51.6	59.6
1982-83	4.0	0.2	55.1	69.3
1983-84	4.0	0.2	50.9	73.0
1984-85	4.0	0.2	59.0	79.4
1985-86	7.8	0.2	72.9	85.1
1986-87	8.0	0.2	95.7	91.7
1987-88	8.1	0.2	98.4	105.3
1988-89	8.6	0.2	95.6	110.7
1989-90	9.1	0.2	98.4	124.7

## Production of Fruits

	Punjab 37	Sind 38	NWFP 39	Baluchistan 40
Guava (000 Tonnes)				
1970-71	51.8	25.7	10.1	0.7
1971-72	52.2	11.7	10.2	0.7
1972-73	80.2	21.3	15.3	0.8
1973-74	74.8	18.5	11.1	0.8
1974-75	86.2	14.5	10.6	0.8
1975-76	81.4	42.8	11.0	0.9
1976-77	79.8	8.1	11.3	1.0
1977-78	85.3	23.3	14.4	1.1
1978-79	96.9	11.0	15.1	1.1
1979-80	90.3	12.1	13.4	1.1
1980-81	95.4	12.2	14.9	1.1
1981-82	167.9	12.6	15.9	1.1
1982-83	215.6	16.5	19.2	1.2
1983-84	237.6	16.6	19.9	1.4
1984-85	149.7	16.7	20.1	1.5
1985-86	274.6	16.3	20.2	1.6
1986-87	279.6	16.3	21.3	1.6
1987-88	295.1	16.4	22.1	1.7
1988-89	298.9	16.5	23.1	1.8
1989-90	303.7	16.5	25.2	1.9



## Annexure-VI

ANNEXURE VI

## Production of Fruits

	Punjab 41	Sind 42	NWFP 43	Baluchistan 44
Dates (000 Tonnes)				
1970-71	30.3	51.5	1.4	74.1
1971-72	47.0	59.6	1.4	75.1
1972-73	31.6	62.9	2.3	57.0
1973-74	29.8	67.4	4.1	76.9
1974-75	27.8	49.5	4.1	77.4
1975-76	35.3	50.1	4.3	78.6
1976-77	51.1	67.8	4.4	78.7
1977-78	53.4	67.2	4.0	83.3
1978-79	41.5	68.0	4.7	83.6
1979-80	40.9	68.2	5.0	84.3
1980-81	41.4	68.7	5.0	79.0
1981-82	61.2	68.2	6.0	79.1
1982-83	65.5	68.6	6.6	83.0
1983-84	72.9	66.1	7.4	84.3
1984-85	76.3	66.0	7.4	84.5
1985-86	87.1	90.4	7.5	83.6
1986-87	91.6	90.4	6.9	84.9
1987-88	92.2	92.0	6.7	85.6
1988-89	93.5	96.1	5.8	86.2
1989-90	93.7	97.4	5.5	87.6

Source: Health Division  
 Provincial Health Forces

## Annexure-VII

## Number of Hospitals/dispensaries and beds by province

Year as on 1st January	Hospitals (a)	Dispensaries (a)	Maternity and Child-welfare Centres	Beds in Hospitals & Dispensaries
<u>Punjab</u>				
1973	239	1,119	422	15,121
1974	239	1,136	431	15,452
1975	234	1,213	451	17,429
1976	235	1,226	463	18,825
1977	232	1,246	459	19,176
1978	230	1,252	476	20,004
1979	232	1,273	483	21,235
1980	234	1,277	508	21,865
1981	236	1,287	510	22,355
1982	237	1,296	506	23,397
1983	239	1,163	476	24,190
1984	239	1,156	467	24,843
1985	246	1,147	469	25,827
1986	255	1,135	438	26,562
1987	255	1,105	449	26,973
1988	257	1,149	448	28,591
1989	256	1,149	469	28,591
1990	257	1,168	471	32,981
1991	281	1,300	495	34,436

Source: 1. Health Division  
2. Provincial Health Directorates.

## Number of Hospitals/dispensaries and beds by province

Year as on 1st January	Hospitals (a)	Dispensaries (a)	Maternity and Child-welfare Centres	Beds in Hospitals & Dispensaries
1973	116	858	116	9,608
1974	117	874	113	10,089
1975	119	888	118	10,659
1976	122	931	121	11,615
1977	129	1,020	123	12,621
1978	136	1,033	126	13,158
1979	143	1,109	129	13,606
1980	190	1,185	127	15,477
1981	191	1,232	133	15,773
1982	197	1,291	131	16,074
1983	206	1,351	137	16,405
1984	210	1,394	138	16,833
1985	217	1,457	146	17,547
1986	225	1,503	150	18,206
1987	225	1,552	147	17,587
1988	248	1,563	150	19,936
1989	254	1,585	147	20,480
1990	258	1,612	151	21,610
1991	276	1,702	155	23,677

Source: 1. Health Division

2. Provincial Health Directorates.

## Annexure- IX

## Number of Hospitals/dispensaries and beds by province

Year as on 1st January	Hospitals (a)	Dispensaries (a)	Maternity and Child-welfare Centres	Beds in Hospitals & Dispensaries
<u>NWFP</u>				
1973	139	452	82	5,856
1974	138	461	83	5,852
1975	138	478	83	6,454
1976	139	522	83	6,609
1977	138	556	95	6,571
1978	141	623	97	7,157
1979	145	632	109	7,367
1980	148	651	126	7,911
1981	138	624	127	7,929
1982	143	582	127	8,390
1983	144	560	128	8,916
1984	145	559	129	9,115
1985	149	541	130	9,596
1986	149	540	130	9,897
1987	151	533	141	10,294
1988	152	587	325	10,346
1989	152	593	328	10,449
1990	154	582	327	11,060
1991	154	585	327	11,060

Source: 1. Health Division  
2. Provincial Health Directorates.

Number of Hospitals/dispensaries and beds by province

Year as on 1st January	Hospitals (a)	Dispensaries (a)	Maternity and Child-welfare Centres	Beds in Hospitals & Dispensaries
<u>Baluchistan</u>				
1973	27	311	42	1,914
1974	27	331	44	1,924
1975	27	331	44	1,924
1976	29	384	48	2,080
1977	29	398	49	2,150
1978	29	398	49	2,150
1979	30	353	51	2,159
1980	30	353	51	2,159
1981	35	335	53	2,384
1982	36	288	53	2,474
1983	37	277	53	2,650
1984	39	277	53	2,812
1985	40	277	53	2,916
1986	41	263	55	3,044
1987	41	262	55	3,044
1988	45	266	68	3,255
1989	45	258	70	3,166
1990	58	296	70	3,535
1991	58	399	73	3,593

Source: 1. Health Division  
2. Provincial Health Directorates.

Number of Primary Schools, Enrolment  
and Teacher by Sex

Year	Primary Schools		Teachers (Primary)		Enrolment (Primary)	
	Total (Number)	Female	Total (000)	Female	Total (000)	Female
1973	49,580	14,437	108.8	32.9	4,450	1,270
1974	50,574	15,061	115.7	33.0	4,810	1,370
1975	51,744	15,673	125.5	42.4	4,971	1,430
1976	52,800	15,829	130.3	44.1	5,319	1,549
1977	53,162	15,941	133.3	44.8	5,611	1,591
1978	53,882	16,238	134.4	45.3	5,015	1,598
1979	55,265	16,854	136.9	42.6	5,131	1,630
1980	57,220	17,771	140.9	47.8	5,213	1,676
1981	59,168	18,595	150.0	48.7	5,474	1,782
1982	61,117	19,420	159.1	49.6	5,741	1,896
1983	71,358	20,245	168.1	50.5	6,179	2,010
1984	73,228	20,876	177.3	57.1	6,860	2,174
1985	73,812	21,551	179.0	57.2	6,828	2,252
1986	77,207	22,441	180.6	57.2	7,094	2,365
1987	97,228	23,480	189.4	62.0	7,639	2,532
1988	105,884	24,898	196.2	64.3	7,959	2,673
1989	111,302	25,962	204.4	66.9	8,316	2,760
1990	118,607	27,333	209.8	69.3	8,615	2,887
1991	127,575	28,535	218.3	71.9	8,856	3,048

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