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**INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT**

**BRIEF APPRAISAL**

**OF**

**REHABILITATION AND DEVELOPMENT PROJECTS**

**IN**

**PAKISTAN**

**March 5, 1951**

**Loan Department**

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BRIEF APPRAISAL OF REHABILITATION AND  
DEVELOPMENT PROJECTS IN PAKISTAN

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PROJECTS READY FOR THE BANK'S CONSIDERATION

An examination of Pakistan's development needs and potentialities leads to the conclusion that the development of electric power, the expansion of agricultural production and the rehabilitation of the railways are of high priority. A limited rehabilitation of telecommunications and radio services and a moderate development of industry are considered of equally high priority.

The following table lists those projects which, according to preliminary technical and financial analyses, can now be considered as a basis for the Bank's participation in the financing of foreign exchange costs.

<u>Project</u>	<u>Bank's Tentative Estimate of Foreign Exchange Component</u>	<u>Bank's Tentative Estimate of Dollar Component</u>
	(000 omitted)	
<u>Power</u>		
Rasul Hydroelectric	* \$ 4,800	-
Diesel Power for the Makerwal Colliery	352	-
Chittagong Diesel Power	* <u>483</u>	-
Total Power	\$ <u>5,635</u>	
<u>Agriculture</u>		
Thal Colonization	* \$ 2,100	\$ 1,500
Lower Sind Barrage	* 7,947	4,000
Improvement of Drainage and Waterways in East Bengal	6,500	1,000
Grain Storage	<u>2,100</u>	<u>1,000</u>
Total Agriculture	\$ <u>18,647</u>	\$ <u>7,500</u>
<u>Railway Rehabilitation</u>	\$ <u>17,700</u>	\$ <u>5,000</u>
<u>Industries</u>		
Paper Mill	* \$ 4,000	\$ 1,300
Three Jute Mills	* 9,750	-
Cotton Mill	<u>2,100</u>	<u>-</u>
Total Industries	\$ <u>15,850</u>	\$ <u>1,300</u>
<u>Telecommunication and Radio Rehabilitation and Improvement</u>	\$ <u>2,450</u>	\$ <u>1,100</u>
Grand Total	\$ <u>60,282</u>	\$ <u>14,900</u>

\* After deducting foreign exchange expenditures reported by the Government of Pakistan as having been made prior to January 15, 1951.

BRIEF APPRAISAL OF REHABILITATION AND DEVELOPMENT PROJECTS IN PAKISTAN

1. General - In July 1950 the Government of Pakistan submitted to the Bank documentation prepared by the Development Board on twenty-five projects which had been approved by the Government as a basis for a request for a loan from the Bank. At the same time, the Bank was asked to send a mission to Pakistan to investigate the projects. The Bank Mission visited Pakistan in October to December 1950 and investigated the projects in the field.

2. The projects originally submitted to the Bank fall into the following six major categories:

TABLE I

		<u>Original Cost Estimates</u> (dollars equivalent) in millions	
<u>Number of</u> <u>Projects</u>		<u>Total</u>	<u>Foreign Exchange</u>
A.	10	Electric power development	\$ 131      \$ 45
B.	6	Agricultural development	143      35
C.	1	Railway rehabilitation	49      49
D.	4	Industry	53      26
E.	1	Port expansion and improvement	44      20
F.	2	Telecommunications and radio	
		rehabilitation and improvement	27      13
	* 24		* \$ 447      * \$ 188

\* Excludes the West Punjab Thermal Station on which there was no information available and which was withdrawn by the Government of Pakistan in November 1950.

3. The estimated costs shown in the above table were, as a result of alterations in some projects, revised by the Government of Pakistan, and the new estimate of the cost is:

In dollar equivalent  
Total: \$398 million      Foreign Exchange: \$178 million

This revision does not include cost estimates for projects mentioned in paragraphs 4 and 5.

4. While the Bank Mission was in Pakistan, the Government asked the Bank to instruct the Mission to include three additional projects in their investigations, namely:

- (i) the expansion of the Karachi Water Supply,
- (ii) the construction of a Fertilizer Plant in the Northwest Frontier Province, and
- (iii) the mechanization of the Makenwal Colliery in West Punjab.

No technical documentation or cost estimates on these projects were submitted to the Mission and, therefore, the projects were not appraised.

5. Discussions held with officials of the Central and Provincial Governments by members of the Mission led to proposals for three additional agricultural projects, namely:

- (i) the improvement of drainage and waterways in East Bengal,
- (ii) land reclamation, and
- (iii) grain storage facilities.

6. Since the return of the Bank Mission, information has been received concerning the amounts of foreign exchange already expended on certain of the projects. In the case of one project, namely, the Malakand Hydroelectric Plant, all of the foreign exchange costs are reported to have been met.

7. According to the original project descriptions submitted to the Bank, the completion of the projects is to be spread over 3 to 5 years.

8. For the sake of convenience, the following brief project appraisals are grouped in the same categories as those shown in Table I in paragraph 2. They have been prepared to enable the Bank to reach a decision on the possible basis for a loan. Complete technical reports now being prepared by consultants and the technical staff of the Bank will be circulated at a later date.

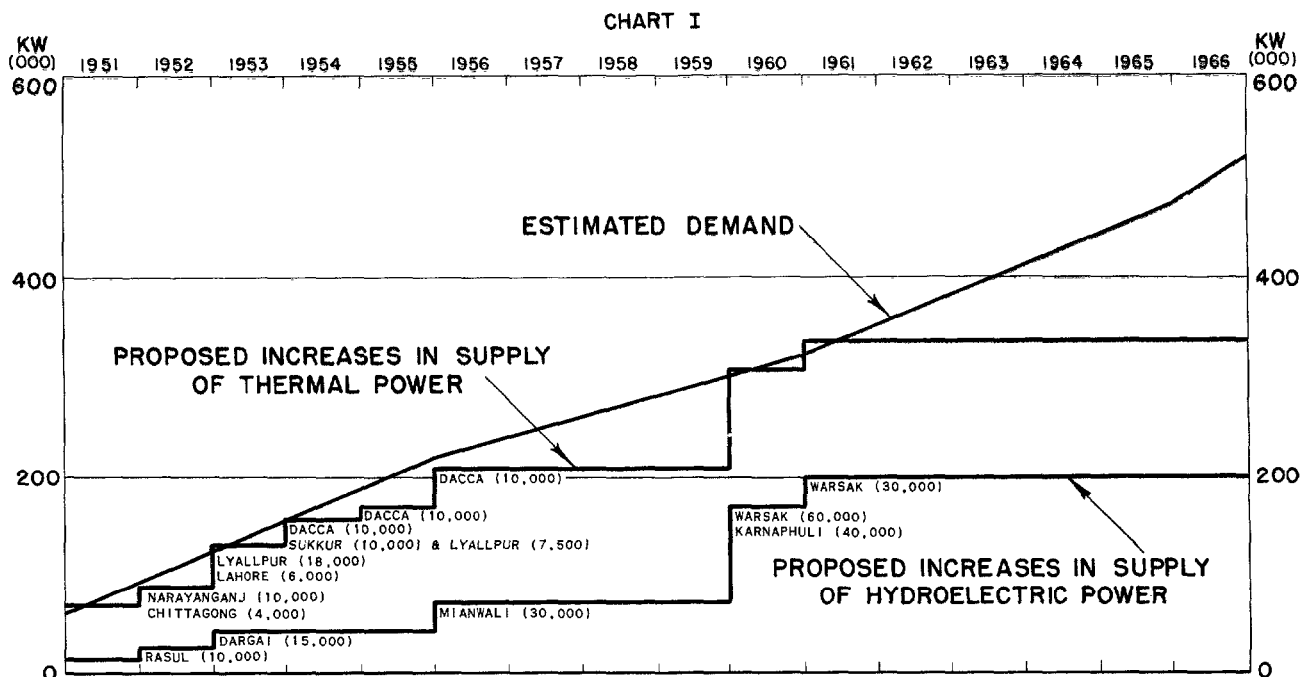
#### A. ELECTRIC POWER PROJECTS

9. General - The southern part of the Northwest Frontier Province and Baluchistan are mostly arid and sparsely populated and, with the exception of a small plant in Baluchistan (Pishin), no power development is proposed in these areas at present. Thus, from a power supply standpoint, Pakistan can be divided into four areas,

- (i) the Sind, including the cities of Karachi, Hyderabad and Sukkur,
- (ii) West Punjab, including the cities of Lahore and Lyallpur,
- (iii) areas in the Northwest Frontier Province in the vicinity of Peshawar, and
- (iv) East Bengal, including the cities of Dacca, Narayanganj and Chittagong.

10. Realizing the country's acute need for electric power and the necessity of formulating a plan for the development of Pakistan's power resources, the Government engaged the engineering firm of Merz Rendel Vatten (an association of two British and one Swedish firms) to make a power survey. Representatives of this firm visited some 250 cities and towns in Pakistan during the latter part of 1949. In 1950 the firm submitted to the Government its report which included a forecast of the potential requirements of Pakistan for the next fifteen years. In this report MRV concluded that lack of power is a major deterrent to Pakistan's agricultural and industrial production.

The chart below illustrates the projected demand and supply of power. The power demand line is based on the MRV report. The power supply line is based on proposals of the Central and Provincial Governments - the timing of some of the proposed generating plants is indefinite, particularly Dacca (for which Bank financing has not been requested), Warsak and Karnaphuli.



11. The city of Karachi is very inadequately supplied by a private power company which is expected to finance its own expansion. The current demand in the Hyderabad-Sukkur neighborhood is to be supplied by a new steam power plant of 25,000 kw.

12. The great need for power in West Punjab is particularly acute in the Lahore - Lyallpur area. In West Punjab, where a relatively large amount of power is being supplied from the Mundi hydroelectric station in India, the MRV engineers estimate that the load will grow from the present 20,000 kw to 100,000 kw in five years. Nearly half of this increased load will result from plans for irrigation and drainage by means of tubewell pumping. The other half will consist of industrial, commercial and domestic loads.

13. In the Northwest Frontier Province there has been a slow steady growth of load in the neighborhood of Peshawar, which is supplied by the province's power station at Malakand. The increase in this load is to be supplied by the extension to this station and the construction of the new station at Dargai. The peak on this system was 8,450 kw in October. Consequently, the Malakand power station, with 9,600 kw of capacity, is operating without any spare unit and only minor increases in load can be accepted until additional generating capacity becomes available.

14. In the Dacca-Narayanganj area of East Bengal the power situation is acute and new jute and cotton mills will create a substantial additional demand. This demand will be met with steam electric and diesel electric installations provided for by the Government. The growth of the port and city of Chittagong, forecast on a very modest basis, envisages an expansion from 1,000 kw to 5,000 kw in the next three or four years.

15. The present power supply of Pakistan, with the exception of the Malakand hydroelectric station, is produced by diesel or steam electric stations. Most of these stations are privately owned and are in a bad state of repair. In West Punjab it is likely that many of these stations will not be repaired at all, but that their loads will be met by the power supply from the new hydroelectric stations.

16. Most of the diesel and steam stations are of average size, poorly maintained, and operated on high price fuel; consequently, rates for electricity in Pakistan are comparatively high. The high level of rates in West Punjab is indicated by those in areas served by thermal stations. They are equivalent to 11½¢ per kwh for lights and fans, 5.6¢ for heating and cooking, and 3.75¢ to 5.6¢ for small industrial operations. In the NWFP, which is supplied by a hydroelectric station, the rates are only slightly lower because the demand exceeds supply.

Power Projects Submitted for Bank Consideration

17. The following table lists the power projects submitted to the Bank and the estimated total cost and foreign exchange component:

TABLE II

Government of Pakistan Priority	Project	Total Cost		Foreign Exchange Component		
		Rupees	\$ Equiv.	Rupees	\$ Equiv.	% of Total
(In thousands)						
1	Dargai Hydroelectric	17,750	5,325	8,400	2,520	47
1	Mianwali Hydroelectric	51,819	15,546	12,500	3,750	24
1	Malakand Hydroelectric	5,682	1,705	3,240	972	57
1	Rasul Hydroelectric	65,700	19,710	27,000	8,100	41
1	Warsak Hydroelectric	156,000	46,800	36,000	10,800	23
4	Hyderabad-Sukkur Thermal	60,000	18,000	40,000	12,000	67
4	Makarwal Colliery Diesel	1,517	455	1,173	352	77
4	Chittagong Diesel	3,200	960	1,870	561	58
4	Pishin Diesel	1,031	309	311	93	30
14	Karnaphuli Hydroelectric	50,000	15,000	20,000	6,000	40
	TOTAL	412,699	123,810	150,494	45,148	36



Dargai Hydroelectric Power Project  
(20,000 kw)

(a) Description of the Project (Government of Pakistan Priority -1)

18. The Dargai hydroelectric power project is located in the Northwest Frontier Province, four miles down the canal from Malakand. The Malakand and Dargai plants are complementary and will feed power into the same 66 kv transmission line. The power house will have four 5,000 kw generating sets; its capacity is estimated at approximately 15,000 kw, one of the units being considered as a spare. The Dargai project is approximately 30% completed and is expected to go on the line late in 1952 or early 1953.

19. The output of the Dargai power station with three units running is expected to be of the order of 16,000 kw, meaning a slight overload on each of the units. Under this condition the annual output would amount to 91,000,000 kwh at 65% load factor. Of the 16,000 kw, 4,000 will be taken by the Wah cement plant (which is at present consuming 2,500 kw). The ordnance factory at Rawalpindi will take 8,000 kw. The remaining 4,000 kw will provide power for domestic and industrial loads.

(b) Conclusions

20. This project is technically and financially sound. However, since the bulk of the power output will not be used for productive purposes, it should not be considered as a basis for Bank financing.

Mianwali Hydroelectric Power Project  
(28,000 kw)

(a) Description of the Project (Government of Pakistan Priority -1)

21. The proposed Mianwali hydroelectric power station will be located one mile north of Mianwali in the northern tip of the Thal area and will draw the water from the Thal main line irrigation canal. The capacity of the Thal canal will have to be increased to 10,000 cusecs by means of further lining. It presently handles for irrigation purposes 6,000 cusecs in summer and 2,500 cusecs in winter. The added capacity of 4,000 cusecs in summer and 7,500 cusecs in winter will be used for the development of power through a 38-foot head. This high power output in winter and low output in summer fits in well with the Rasul power project, the seasonal variations of which are the reverse. The Mianwali power station will have two 14,000 kw generators. It is estimated that the construction of the canal and the power house will require four years. The power will be used by the farmers and light industries in the Thal area and by light industry in and around Lahore.

(b) Conclusions

22. In spite of the apparent excessive mileage of head and tail race canals, this project is financially sound. According to available information its output will be required well before it can come into operation. Since final designs are not yet ready and the construction work which requires 4 years will not start before the end of 1951, the orders for generating equipment need not be placed before the middle of 1952 for delivery in 1954. In these circumstances, it appears advisable for the Bank to defer consideration of participation in the financing of this project until 1952.

Malakand Hydroelectric Power Project  
(19,600 kw)

(a) Description of the Project (Government of Pakistan Priority -1.)

23. The Malakand hydroelectric power project is an expansion of an existing development at Malakand, located on the upper Swat Canal.

24. Power from the Malakand hydro station will supply the requirements of the Northwest Frontier Province in and around Peshawar which is served by a 66 kv system extending to Wah and from Wah to Manshera.

25. The Malakand extension is practically 90% completed and the first unit should be on the line in a few months.

(b) Conclusion

26. As it has been reported that all the foreign exchange costs have been expended, the project need be given no further consideration by the Bank.

Rasul Hydroelectric Power Project  
(22,000 kw)

(a) Description of the Project (Government of Pakistan Priority -1.)

27. The Rasul hydroelectric power project, located at Rasul in the northeastern area of West Punjab, will utilize the head existing between the upper Jhelum and lower Jhelum canals approximately 90 feet in a distance of 9,000 feet. The station will have two 11,000 kw generating units. It is estimated that the plant will be completed in the spring of 1952.

28. Originally this power was to be utilized in a tubewell program designed to lower the water table in the water-logged lands of the area. The tubewell pumping program, however, has not been sufficiently prepared, but a rational tubewell program is now being developed with the aid of Point IV technicians. Before the program is initiated it will be necessary to determine the location and distance between the wells,

the relationship between pumping time and the reduction in elevation of the water table, design of the well and design of the pump and motor drive. This preliminary work is likely to take a few years during which no power from the Rasul plant will be needed for the tubewell program.

29. At present, however, the output of the Rasul plant is urgently needed for industrial, agricultural and domestic use in the area contiguous to Lahore and Lyallpur. 14,200 kw will be transmitted from Rasul over a double circuit 132 kv line by way of Jhelum to the Shalamar substation at Lahore and will be utilized for the electrification of 28 towns. The estimates of the consulting firm Merz Rendel Vatten, for five years after the completion of the Rasul plant, indicate that the requirements will probably exceed the firm capacity of 14,200 kw.

30. The secondary energy, which will approximate about half the annual output of the station, will be used by the irrigation branch in tubewell pumping when the tubewell program has been developed. The proposal for additional transmission facilities consisting of a double circuit 66 kv line from Gujranwala to Lyallpur designed strictly to supply a tubewell load, has been omitted from consideration in the present analysis. The construction of this line should be deferred until the tubewell program has been prepared, and should be restudied in the light of the then existing conditions.

(b) Estimated Cost

31. The following table shows the estimated cost and foreign exchange component.

	<u>Total</u>		<u>Foreign Exchange</u>	
	<u>Rupees</u>	<u>\$ Equiv.</u>	<u>Rupees</u>	<u>\$ Equiv.</u>
		(000 omitted)		
Generating Plant	28,200	8,460 )		
Transmission Lines	29,833	8,950 )	27,000	8,100
Distribution System	<u>7,667</u>	<u>2,300</u> )		
	Rs. <u>65,700</u>	<u>\$19,710</u>		
Reported Foreign Exchange costs expended by mid-January 1951			11,000	3,300
Estimated Foreign Exchange costs to be expended			16,000	4,800

(c) Comments

32. This project is technically well conceived and properly designed. It is being executed by the Public Works Department of West Punjab, who are competent in this type of work. The estimated cost of construction appears to be reasonable.

33. The analysis of earnings shown in the table below assumes that half of the energy will be assigned to the electrical branch and half to the irrigation branch of the Government of West Punjab. The earnings from power to be sold for pumping have been estimated at rates substantially lower than the existing rates charged for domestic and industrial loads.

	<u>Estimated Earnings</u> (000 omitted)	
	<u>Rupees</u>	<u>\$ Equivalent</u>
Estimated Revenue	14,419	4,326
Estimated Expense:		
Fixed charges	4,273	1,282
Operating cost	440	132
Amortization of foreign exchange loan equiv- alent to \$4,800,000	<u>800</u>	<u>240</u>
Total expense	<u>5,513</u>	<u>1,654</u>
Estimated net income	<u>8,906</u>	<u>2,672</u>

(d) Conclusions

34. In view of the latent industrial and domestic demand for power in the Lahore-Lyallpur area, and an early prospective increase in these demands, this project appears to be worthy of consideration for the Bank's participation in the financing of the foreign exchange cost.

Warsak Hydroelectric Power Project  
(150,000 kw)

(a) Description of the Project (Government of Pakistan Priority - 1(e).)

35. The Warsak Dam is located on the Kabul River in the Northwest Frontier Province about 20 miles northwest from Peshawar. It would consist of a rock-filled dam approximately 240 feet high from the foundations and an underground power house with five 30,000 kw units. In addition, a high level canal would take off from above the dam and would irrigate between 73,000 and 93,000 acres.

36. It is proposed to transmit the power from this station over a double circuit 220 kv line to the West Punjab grid where the energy would be sold by the Northwest Frontier Province Government in bulk to the West Punjab grid.

37. Extensive field explorations have been capably carried out by the Public Works Department of the NWFP at the Warsak Dam site, including core drilling on both banks of the river together with exploration tunnels driven about 1,000 feet into the hillside. Drilling in the river bed was just starting in the middle of November and the first hole had not reached rock at 65 feet as of early December. No further information as to the results of the river bed borings have been received.

(b) Comments

38. It is unfortunate that the core borings in the bed of the river have not proceeded further at this time. The concern is not that rock will be reached at a much lower elevation than the original estimates were based on, namely 40 feet below water surface, but that the river bed may be located in a fault in the rock formation. Should this be the case, it would probably preclude the construction of the project.

(c) Conclusions

39. Generating and transmission equipment for Warsak cannot be utilized for several years even if the river bottom soundings show that the project can be constructed. Orders for this equipment need not be placed for another two or more years but it may become necessary for the Northwest Frontier Province Government to purchase such construction equipment as excavators, drills, jumbos, dynamite, etc., at an earlier date. In these circumstances, it is necessary to defer consideration of this project until the river borings indicate that the project is feasible.

Hyderabad and Sukkur Thermal Power Project  
(25,000 kw)

(Government of Pakistan Priority - 4)

(a) Comments

40. In the absence of the engineer directly responsible for the project, it was discussed with the Central Engineering Authority whose engineers were not acquainted with the details of the project.

(b) Conclusion

41. A thorough examination is necessary before further consideration need be given to this project.

Diesel Power Station for the Makerwal Colliery  
(2,000 kw)

(a) Description of the Project (Government of Pakistan priority -4.)

42. The coal resources of Pakistan have been exploited only in a primitive way mainly because coal had been supplied by the well-developed coal deposits of Bihar in eastern India. Thus, prior to Partition, there was little or no need for developing the coal deposits now lying in Pakistan. Since Partition, however, the existing coal deposits of Pakistan have assumed a more important role and the Government retained the services of Powell Duffryn Technical Services Ltd. to survey and report on the production and utilization of coal in Pakistan. The coal report submitted by the consultants in 1949 included detailed recommendations on the improvement of output and the reduction of production costs of the Makerwal Collieries, the largest coal producer in Pakistan (about 100,000 tons of coal a year). The consultants found the present power supply of the colliery to be inadequate and in extremely poor physical condition. They recommended (i) that the power supply of the colliery should be replaced and centralized and (ii) that steam turbogenerators of 1,335 kw should be installed.

43. The present proposal of the Pakistan Government is to install four 500 kw diesel-driven sets, one of which would serve as a spare.

(b) Estimated Cost

44. The following table shows the estimated cost and foreign exchange component:

<u>Rupees</u>	<u>Total</u> <u>\$ Equivalent</u>	<u>Rupees</u>	<u>Total</u> <u>\$ Equivalent</u>
1,517	455	1,173	352

(000 omitted)

(c) Comments

45. The advisability of installing a diesel rather than a steam station is now being studied. The comparative costs of the generating equipment will probably be the same but, in the case of a steam station, the cost of a water pipeline must be added. This pipeline may, nevertheless, prove to be a necessary investment for the development of the mine.

46. Comparison of the cost per kw installed for the Makerwal station with the diesel stations proposed for Pishin and Chittagong gives the following results:

Makerwal	-	Rs. 758 per kw
Pishin	-	Rs. 730 per kw
Chittagong	-	Rs. 739 per kw.

47. The cost estimate of this station appears to be reasonable. The power is essential for the present annual production of 100,000 tons of coal and it may be expected that, with the improved power supply, coal mining equipment could be used and production increased by 60,000 to 100,000 tons of coal per year.

(d) Conclusions

48. In the light of the serious situation confronting the Makerwal Colliery because of the inadequate power supply, the project should be considered for the Bank's participation in the financing of the foreign exchange cost.

Chittagong Diesel Power Station Project  
(4,000 kw)

(a) Description of the Project (Government of Pakistan priority -4)

49. Power for the city and the port of Chittagong is at present supplied to the extent of 1,000 kw from the power station of the East Bengal Railway. In view of the growing demand for power in the area, the East Bengal Government is installing a 4,000 kw diesel station. The new station will consist of two 650 kw diesel sets ordered from the Crossley Company in England and three 970 kw sets from the Deutz Company in Germany. Delivery of generating equipment is expected early in 1951 and the station is scheduled to be completed by June of 1952.

(b) Estimated Cost

50. The following table shows the estimated cost and the foreign exchange component:

	<u>Rupees</u> (000)	<u>\$ Equiv.</u> omitted)
Total Cost	3,200	960
Estimated Foreign Exchange required	1,870	561
Reported Foreign Exchange costs expended by mid-January 1951	260	78
Estimated Foreign Exchange costs to be expended	1,610	483

(c) Comments

51. There appears to exist at present a demand equivalent to the proposed increased output and it is believed that the East Bengal Government has personnel capable of operating the plant.

52. The estimated earnings of the proposed station are shown in the table below:

	<u>1952-53</u>	<u>1955-56</u>
	(000 omitted)	
Estimated Gross revenues @ 1.7 annas (about 3¢) per kwh	Rs. 658 (\$198)	Rs. 1,027 (\$308)
Estimated operating expenses and fixed charges	<u>629</u> (\$189)	<u>897</u> (\$269)
	Rs. 29 (\$9)	Rs. 130 (\$39)
Annual amortization of a loan of Rs. 1,600,000 (\$480,000)	Rs. 80 (\$24)	Rs. 80 (\$24)

The 1952-53 deficit after amortization charges could be more than covered by increasing the proposed rate of 1.7 annas (about 3.2¢) per kwh to 2 annas (or 3.8¢) per kwh. The proposed rate of 1.7 annas is lower than the rates prevailing in other parts of East Bengal.

53. If the Karnaphuli hydroelectric plant (see paragraphs 60-62 below) is built, the equipment of the Chittagong station could be used in other parts of Pakistan where the power situation is acute.

(d) Conclusions

54. This project is essential to meet the needs of the important and growing city and port of Chittagong. Subject to further investigation of the rate structure, the project should be considered for the Bank's participation in the financing of the foreign exchange cost.

Pishin Diesel Power Project  
(1,000 kw)

(a) Description of the Project (Government of Pakistan Priority -4.)

55. The Pishin power project provides for the construction of a 1,000 kw diesel station consisting of one 500 kw and two 250 kw units located at Pishin in Baluchistan with the attendant system designed primarily to supply power for irrigation pumps. This area is irrigated by means of wells equipped with Persian wheels, usually powered by camels. The proposed power project is destined to supplant camel power by electric motors.

(b) Estimated Cost

56. The following table shows the estimated cost and the foreign exchange component:



	<u>Total</u>		<u>Foreign Exchange</u>	
	<u>Rupees</u>	<u>\$ Equivalent</u>	<u>Rupees</u>	<u>\$ Equivalent</u>
	(000 omitted)			
Generating Plant	592	177 )		
Transmission Lines	580	114 )	311	93
Contingencies	<u>59</u>	<u>18</u> )		
TOTAL	Rs. 1,031	\$309		

(c) Comments

57. Each well requires about  $1\frac{1}{2}$  hp which is admittedly a heavy load for a camel. As a result of the load, the life of a camel on a Persian water wheel lasts only from six to twelve months. Assuming an average life of eight months for a camel, and its present market price at 500 rupees, the operating cost (in terms of camels) runs at Rs. 750 per year per well.

58. Annual revenues have been estimated as from Rs. 321,400 in the first year to over Rs. 600,000 the fifth year. Total annual expenses and fixed charges, including amortization of the foreign exchange loan of \$93,000, has been estimated at Rs. 276,600.

(d) Conclusions

59. While additional information is required to determine the location and number of pumps, the flow of water in present and prospective wells, and the amount and type of land that would be profitable to irrigate, the preliminary analysis of this project indicates that it should be considered for Bank's financing of the foreign exchange cost.

Karnaphuli Hydroelectric Power Development

(a) Description of the Project (Government of Pakistan Priority -14)

60. The Karnaphuli Hydroelectric Development was originally proposed at a site on the Karnaphuli River about seven miles upstream from the town of Rangamatti where it was proposed to install 40,000 kw. This project was laid out by the consulting engineers to the Government of Pakistan, Merz Rendel Vatten. At the instance of the Bank Mission's consultant, another site about thirty miles further downstream is now being investigated.

(b) Comments

61. This downstream location has a number of advantages if it can be utilized. These include a much larger reservoir area together with a greatly increased river discharge resulting in three times the electrical capacity of the upstream site with a much greater influence on the control of floods in the river. It appears probable, moreover, that the

estimated cost of the project, namely \$15 million, would not be substantially altered were it built at the lower site, unless, of course, substantially more generating equipment were installed to take advantage of the greater flow of water available. Preliminary borings at the downstream site gives some hope that expectations of good subsurface conditions may be realized. Until, however, more extensive exploration has been carried out it is impossible to state definitely whether or not the site is practical.

(c) Conclusions

62. It is recommended to postpone further consideration of this project as a basis for a loan since it is not yet in a sufficiently advanced stage of technical preparation.

Power Projects For Immediate Consideration By The Bank

63. The following table lists the power projects which, according to preliminary technical and financial analyses, can be considered as a basis for the Bank's participation in the financing of foreign exchange costs.

TABLE III

<u>Project</u>	<u>Estimated Foreign Exchange Cost To Be Financed by the Bank</u> (U.S.\$ Equiv. - 000 - omitted)
Rawal Hydroelectric	4,800
Makerwal Colliery	352
Chittagong Diesel	483
Pishin Diesel	93
	<u>5,728</u>

B. AGRICULTURAL PROJECTS

General

64. Agriculture in Pakistan and its prospects are discussed in Chapter IV of the Economic Report on Pakistan (E140b).

65. In addition to the expansion of agricultural yields through irrigation, drainage, fertilization, etc., the Government is vitally concerned with the mechanical reclamation of new lands for the settlement of refugees and the replacement of animal by mechanical cultivation of land. The two most important colonization projects are the Thal Development and the Lower Sind Barrage Project, and the work on both is already well advanced.

66. Since the main exports of Pakistan are agricultural products, the expansion of productive areas and the improvement of yields will have a direct effect on the balance-of-payments.

Agricultural Projects Submitted for Bank Consideration

67. The following table lists the agricultural projects submitted to the Bank and the estimated total cost and foreign exchange component:

TABLE IV

Government of Pakistan Priority	Project	Total Cost		Foreign Exchange Component		
		Rupees	\$ Equiv.	Rupees	\$ Equiv.	% of Total
(In thousands)						
7	Thal Colonization	211,000	63,300	9,500	2,850	5
8	Lower Sind Barrage	102,000	30,600	32,658	9,797	32
9	Central Agri. Eng. Org.	33,000	9,900	10,000	3,000	30
10	Canal Maintenance Machinery	21,906	6,572	14,608	4,382	67
11	Mechanical Cultiva- tion in East Bengal	29,000	8,700	26,000	7,800	90
13	Power Pump Irrigation in East Bengal	8,563	2,569	4,313	1,294	50
	TOTALS	<u>405,469</u>	<u>121,641</u>	<u>97,079</u>	<u>29,123</u>	<u>24</u>

68. In addition, the following proposals for projects were discussed by the Mission with the Government of Pakistan:

Mechanical Reclamation in East Bengal  
Drainage in East Bengal  
Grain Storage.

Thal Colonization Project

(a) Description of the Project (Pakistan Government Priority -7.)

69. The Thal colonization project aims at settling 250,000 refugees on nearly two million acres of reclaimed land, potential cropland, presently lying idle. Of this acreage approximately 600,000 acres will be purchased from private land owners; 1,000 new villages will be laid out and built, and 38,000 houses constructed.

70. The Provincial Government of West Punjab have enacted legislation and set up a Thal Development Authority to develop and operate the Thal Project. The Authority is empowered to buy, reclaim and sell land, construct villages, roads, houses and other amenities such as schools, dispensaries, etc., for the colonists of the area and to buy and operate machinery and equipment. The Authority has had two years of successful experience in this type of operation and is well qualified to carry out this project. It has a capable and experienced chief engineer, a mobile and a stationary workshop, and a nucleus of trained mechanics and tractor operators.

71. At the close of the 1949-50 fiscal year, 147,000 acres had been put under cultivation and a system of irrigation canals had been built at a cost of about Rs. 155 million. A road program for the reconstruction of 600 miles of blacktop roads in the Thal area at a cost of nearly Rs. 30 million has been prepared and about 15 per cent of the roads have been completed.

72. The project is being financed by advances on a loan and grant basis from the Provincial and Central Governments. The loans are for a 25-year term and bear interest at 4% per year.

(b) Estimated Cost

73. The total cost of the colonization project, including the irrigation and road programs, is estimated to be Rs. 211 million (equivalent to about \$63.3 million). The foreign exchange requirements (tractors and spare parts) are estimated to be Rs. 9.5 million (equivalent to about \$2.8 million), of which Rs. 2.4 million (equivalent to about \$ .7 million) have been spent as of about mid-January 1951. The foreign costs yet to be expended are estimated to be Rs. 7.1 million (equivalent to about \$2.1 million).

(c) Comments

74. Recoverable advances for buying land, buildings, workstocks and implements will be given to settlers in the colony. These advances have been carefully worked out and show that the farmer's expected revenues will cover his expenses and loan obligations with a 26% margin.

75. An analysis of the project's costs and benefits shows that land sales, payments by the settlers, and other income will amortize the costs. It is also estimated that the production of food grains, cotton

and sugar cane in the Thal area will bring in or save between Rs. 80 and 90 million (equivalent to about \$24 and \$27 million respectively) of foreign exchange annually. The tractors purchased with foreign exchange will be operated and maintained by the Authority and used for land reclamation and for cultivation of the settlers' lands. The costs of these operations will be recouped from the settlers.

(d) Conclusion

76. This project appears worthy of consideration for the Bank's participation in the financing of the foreign exchange cost.

Lower Sind Barrage Project

(a) Description of the Project (Pakistan Government Priority -8.)

77. The Lower Sind Barrage is an irrigation project covering 2.75 million acres. It consists of a barrage or movable dam located at Kotri near Hyderabad which will provide water for perennial canals having a reduced flow in winter and non-perennial canals flowing from April to September. The canals will improve the irrigation of existing inundation canals, and will extend irrigation into new areas.

78. There will be in the scheme a settled area called Kaburi, of 1,204,129 acres, and a waste area, now owned by the Sind Government, called Nakabuli, of 1,544,628 acres. The Kaburi is now privately owned, generally in large blocks. The Nakabuli, which will become productive as a result of irrigation, is to be sold to settlers and the revenue applied against the cost of the project.

79. The barrage is now under construction and its completion is estimated for 1955. Construction on the canals is underway with modern American excavating machinery.

(b) Estimated Cost

80. The following table shows the estimated cost and the foreign exchange component:

	<u>Total</u>		<u>Foreign Exchange</u>	
	<u>Rupees</u>	<u>\$ Equiv.</u>	<u>Rupees</u>	<u>\$ Equiv.</u>
	(000 omitted)			
Headworks	52,000	15,600	32,658	9,797
Canals	50,000	15,000		
Total	Rs. 102,000	\$30,600		
Reported Foreign Exchange costs expended by mid-January 1951			6,166	1,850
Estimated Foreign Exchange costs yet to be expended			26,492	7,947

81. Statements made to the Mission by the Pakistan officials raised the question of the amount of foreign exchange cost which the Bank is requested to finance. (During the Mission's visit to the site, excavating equipment and spare parts which were included in the list of goods to be financed were on the site.) The Government of Pakistan has been asked to submit to the Bank an up-to-date estimate of the cost of the equipment still to be imported for this project.

(c) Comments

82. The original financial estimates of the project prepared by the Sind Government were based on the following assumptions:

- (i) a charge of Rs.  $4\frac{1}{2}$  per acre per year would be levied for water used for rice cultivation (in the adjacent irrigation project, known as the Sukkur, the charge is Rs. 15 per acre);
- (ii) the estimated asking price per acre of land will be Rs. 110 (the actual asking price at Sukkur is in the neighborhood of Rs. 200 an acre);
- (iii) no charge would be provided for the increased productivity of the land now privately held (in the Sukkur such charge is imposed);
- (iv) the sale of the newly irrigated land now held by the Sind Government would be over a period of 40 years (it is the consensus that all the land can probably be sold within 25 years).

83. As a result of discussions between the Mission and the officials of the Sind Government, the project is being completely recast with the objective of putting it on a realistic financial basis. The Bank has been informed that this has been done and that the revised project is being forwarded to the Bank.

84. The Sind Assembly passed a law providing for a crop pattern for a 62% rice utilization. A difference of opinion on the crop pattern arose between Pakistan agricultural experts and the Sind land owners. In the opinion of agricultural experts, the legislated pattern will cause water-logging of the irrigated area within about five years.

85. A different crop pattern for the area irrigated from the Lower Sind Barrage was worked out by the Bank Mission and communicated to the Central Government. If adopted, the proposed crop pattern would raise the annual income from the agricultural products by about 40%. This pattern provides for a decrease in the acreage planted to rice and for an increase in the acreage planted to sugar cane and cotton. It has been checked against the water supply and soil conditions and is considered feasible.

86. The project is soundly engineered and is considered important because:

- (i) it would assist in the settlement of evacuees, who would be productively employed;
- (ii) it would increase exports of wheat, rice and cotton, and decrease imports of oilseeds and sugar. The resulting earnings or savings of foreign exchange after the project has been completed can be estimated at approximately Rs. 170 million in soft currencies and Rs. 20 million (sugar) in hard currencies, a total of Rs. 190 million (equivalent to about \$57 million).

(d) Conclusions

87. In view of the importance of this project, it is considered that the Bank should assist the Government in developing a sound system of rates and charges and in devising the most productive land use pattern, and should consider participation in the financing of the foreign exchange cost.

Project for the Establishment of a  
Central Agricultural Engineering Organization

(a) Description of the Project (Government of Pakistan Priority -9.)

88. This project provides for the formation of the above organization by the Central Government for the purpose of land reclamation, mechanical land cultivation and popularization of the use of machinery on farms. The organization would be established gradually over a five-year period. It would own and operate or rent out to the Provincial Governments six batteries of tractors of various sizes for land reclamation and cultivation. It would also own and operate one central and ten subsidiary workshops, of which six would be mobile. Its operations would be confined to West Pakistan.

(b) Estimated Cost

89. The following table shows the estimated cost and foreign exchange component:

	<u>Total</u>		<u>Foreign Exchange</u>	
	<u>Rupees</u>	<u>\$ Equiv.</u>	<u>Rupees</u>	<u>\$ Equiv.</u>
			(000 omitted)	
Land and Buildings	8,475	2,542	10,000	3,000
Equipment	24,525	7,358		
Total	<u>33,000</u>	<u>9,900</u>		

(c) Comments

90. There are five areas in Pakistan where mechanization might be established. The first area is East Bengal, with an annual rainfall ranging from 90 to 200 inches. The other four areas are all located in West Pakistan with an annual range in rainfall of about 5 to 15 inches. These are (1) the area comprising the Thal Development; (2) the badly eroded section around Rawalpindi in West Punjab; (3) the land around Peshawar in the Northwest Frontier Province; and (4) the land already irrigated and to be irrigated, including Karachi, in the Sind. Each of the above areas has its own particular mechanization problem.

91. The Pakistan Government is contemplating the mechanization of agricultural production in the areas which have hitherto lain fallow or have been confined to subsistence farming. It may be economically sound to use tractors and other power equipment for reclamation and development of these areas. However, once the land has been reclaimed and settled by farmers, then the sound economic policy of farming might be the use of improved hand tools and animal drawn implements rather than of mechanical equipment.

92. Even if the development of farm mechanization is found desirable and practical, the extremely limited number of people who have any experience with the simplest of mechanical tools and equipment will require a much more modest start than is envisaged in the project. Thus the project needs careful planning and a more complete preparation of its financial and training aspects. Technical assistance might be of great value in starting this project.

93. This project is closely related to the Project for Mechanical Cultivation in East Bengal (see paragraphs 98 to 102) and the Proposal for Mechanical Reclamation in East Bengal (see paragraphs 107 to 109).

(d) Conclusion

94. This project, as well as the two mentioned in paragraph 93, has not been sufficiently prepared to warrant the Bank's consideration at this time.

95. It would appear advisable to propose to the Pakistan Government to approach technical assistance organizations (F.A.O., U.S. Point Four and Colombo Council for Technical Cooperation) and with their assistance to investigate and develop a scheme that would muster domestic and foreign experience and personnel to organize, train, equip and execute operations proposed in this and the other two related projects. Once the scheme is developed the Bank could consider participation in the financing of a pilot project for land reclamation and cultivation.



Project for Canal Maintenance Machinery

(a) Description of the Project (Government of Pakistan Priority -10)

96. This project provides for the purchase of excavating machinery for the purpose of maintaining the capacities of barrage canals by the removal of silt and maintenance of bunds. The Mission was unable to obtain from the responsible officials in charge either technical information concerning the conditions of silting, or financial data which would permit an analysis of the project.

(b) Conclusion

97. Further consideration of this project should be deferred until adequate information is made available.

Project for Mechanical Cultivation in East Bengal

(a) Description of the Project (Government of Pakistan Priority -11)

98. This project provides for the purchase by the Government of 450 tractors over a period of five years, the establishment of operating and maintenance centers in different places and the rental of the tractors.

99. The objective of the project is to replace draught cattle in East Bengal in cases where (i) draught cattle are scarce and expensive and good land is left idle; (ii) the cultivation season is short and (iii) the contour of the land is such that only mechanical cultivation is possible.

(b) Estimated Cost

100. The following table shows the estimated cost and foreign exchange component:

	<u>Total</u>		<u>Foreign Exchange</u>	
	<u>Rupees</u>	<u>\$ Equiv.</u>	<u>Rupees</u>	<u>\$ Equiv.</u>
	(000 omitted)			
Tractors, buildings and equipment	29,000	8,700	26,000	7,800

(c) Comments

101. The project has been prepared on the assumption that each tractor will work 6 acres per day and 120 days per year. (No allowance has been made for double or triple ploughing or harrowing.) Total annual cost of the operation at Rs. 31 (equivalent to about \$9.30) per acre would amount to about Rs. 10 million (equivalent to about \$3 million). No data, how-

ever, were available to show the acreage of good land lying idle for lack of cattle, and no information was provided to show that the tractors could work 120 days in the short period during which ploughing is possible. The expected increase in the annual production by 116,000 tons was based on the assumption that all of the 324,000 acres to be cultivated are presently lying idle. No trained staff to handle the tractors and the workshops is now available.

(d) Conclusions

102. In view of the above, it is considered that this project should be preceded by experiments with tractors on flooded ricelands of East Bengal, and by a thorough study of the agricultural, economic and social implications of large-scale use of tractors in this densely populated area. (See conclusions in paragraphs 94, 95 and 106.)

Power Pump Irrigation Project

(a) Description of the Project (Government of Pakistan Priority -13)

103. This project provides for the purchase of 500 pumps over a period of five years (100 pumps annually) for use in East Bengal. By lifting the water from rivers and canals the acreage of "double-cropped land" growing wheat or rice would be increased. The pumps would be installed on pontoons and would be moved out of reach of floods during the monsoon period.

(b) Estimated Cost

104. The following table shows the estimated cost and foreign exchange component:

	<u>Rupees</u>	<u>\$ Equiv.</u>
	(000 omitted)	
Estimated Total Cost (including operating costs for 5 years)	8,563	2,569
Estimated Foreign Exchange Cost	4,313	1,294

(c) Comments

105. In 1947-49, an experimental operation with 20 pumps irrigated 90 acres per pump at a cost of Rs. 23 per acre, and the value of the crop yield was estimated at Rs. 100 per acre. On the basis of this experiment only, about 50,000 acres would be irrigated by 500 pumps and only 20-30,000 tons of clean rice would be obtained from this acreage. By comparison, 63 drainage schemes improving 160,000 acres and yielding 77,000 tons of food grains annually have recently been carried out. The capital cost of these schemes was Rs. 3.5 million as compared with Rs. 5 million for the pump irrigation project. Moreover, annual recurring costs of these schemes were insignificant where-

as in the pump irrigation scheme they are estimated at about Rs. 1.2 million annually once the scheme is in full operation. A further difficulty is the lack of people trained in the operation and maintenance of pumps which are located at considerable distances apart.

(d) Conclusion

106. This project is not regarded as worthy of consideration for the Bank's financing. It was virtually withdrawn by East Bengal authorities and the Mission discussed with them a proposal for a substitute project of Mechanical Reclamation in East Bengal (see paragraphs 107-109 below).

Proposals for Agricultural projects discussed between  
the Mission and Government Officials

Mechanical Reclamation in East Bengal

(a) Description of the Proposal

107. The area of unused reclaimable land is reported as 260,000 acres. It consists of high land, covered with thick jungles and swamps where drainage channels or embankments are needed.

108. Three pilot schemes have already been drawn up for immediate execution. An area of 18,000 acres would be reclaimed at a cost of Rs. 4 million (equivalent to about \$1.2 million). The foreign exchange component has not yet been estimated. The productivity of the soil under these schemes has been assumed at no greater than the normal 10 maunds per acre (nearly 1 ton per hectare), which seems conservative. The East Bengal authorities were aware of the relevant recent experiments with jungle clearing in Malaya and North Borneo. That experience should be drawn on for further development of the East Bengal plans.

(b) Conclusions

109. It is considered that further study should be made with the aid provided by technical assistance organizations. (See paragraph 95 above.) Once this proposal is developed the Bank could consider participation in the financing of a pilot project.

Improvement of Drainage and Waterways in East Bengal

(a) Description of the Proposal

110. Only a minor part of the 58,000 villages in East Bengal are accessible by any kind of road and the majority of the rural population depends on transportation on the rivers, whose channels criss-cross the entire country. At present, however, only 2,200 miles of these waterways are navigable throughout the year, an additional 470

miles being navigable during the monsoon season only.

111. Under the proposal, over 4,000 miles of new perennial channels would be constructed. They would serve to (i) increase the production of rice and other foodstuffs by an estimated 300,000 tons or 4-5% of the present production in East Bengal; (ii) reduce the cost of marketing and thereby increase the return to the farmer; (iii) reduce inland prices of imported textiles, wool, sugar, salt, mustard oil and other necessities of life for the rural population; and (iv) greatly enhance the accessibility of the enormous rural population to the large and small urban centers which is a prerequisite to the improvement of education, health and government administration. A calculation has been made that, with a registration tax on different kinds of rivercraft, the expenses for the waterways would be recouped.

(b) Estimated Cost

112. The cost of this proposal is estimated at Rs. 188 million (equivalent to about \$56.4 million) of which the foreign exchange component is estimated at Rs. 21.8 million (equivalent to about \$6.5 million).

(c) Comments

113. Since Partition, the East Bengal Government has completed 63 such projects, which have benefited 160,000 acres and increased their grain production by over 77,000 tons. (See paragraph 105 above.) The province, having acquired considerable experience, has under execution 50 additional drainage projects, and over 100 more are either ready to start or in the process of being prepared. Preliminary investigations indicate that improved drainage would safeguard rice crops and increase yields to the extent that the foreign exchange cost of the project would be more than covered in one year.

114. The East Bengal Government was sympathetic to this proposal, which is reported to have been approved by the Central Government.

(d) Conclusion

115. The proposal appears practical and desirable, and it is considered that, subject to further technical and financial investigations, it could be considered as a basis for Bank participation in the foreign exchange cost.

Grain Storage

(a) Description of the Proposal

116. In the discussions with the Government, the Mission asked what steps the Government proposed to take to reduce the substantial losses of grain resulting from inadequate storage facilities. The Government recognized that the present storage capacity of small scattered units

totalling 100,000 tons is extremely inadequate for the country's annual grain crops and concurred with the views of the Mission that the prices for, and the competitive position of, Pakistan's wheat and other grains are at a disadvantage in world markets because of lack of grading and cleaning.

117. From preliminary investigations and available data it is evident that there is an acute need for a few storage centers with an annual capacity to handle around 2 million tons of grains.

(b) Proposed Basis for a Project

118. According to the Mission's agricultural expert, the project for grain storage should envisage:

- (i) static storage facilities of about 40,000 tons for the city of Karachi to store and process the annual wheat requirements of its growing population of about 1.25 million people;
- (ii) a grain handling plant of 20,000 to 25,000 tons static storage capacity for the Port of Karachi to handle peak exports of up to 35,000 tons of export wheat per month;
- (iii) an expansion of the existing plant in Lyallpur (east of Lahore); and
- (iv) a plant of about 10,000 to 12,000 tons capacity in East Bengal to store and process about 75,000 tons for its annual requirements.

119. A detailed engineering survey of the grain storage project will be needed along lines which will probably be indicated in the FAO report now being prepared. The project should include cleaning and grading equipment.

120. Participation in this project by farm cooperatives is desirable from the viewpoint of obtaining private funds and assurances that farmers as well as traders recognize the benefits of the facilities.

(c) Estimated Cost

121. The envisaged grain storage facilities would probably cost in the neighborhood of Rs. 15 million (equivalent to about \$4.5 million) including Rs. 7 million (equivalent to about \$2.1 million) in foreign exchange. (These amounts are estimates based on the Turkish grain storage project.)

(d) Conclusions

122. In view of the urgent need of grain storage facilities it is considered that this proposal should be prepared as soon as possible. If the suggested survey were to prove that the proposal is self-

supporting, the Bank could consider the financing of the foreign exchange cost.

Agricultural Projects for Immediate Consideration by the Bank

123. The following table lists the agricultural projects which, according to preliminary technical and financial analysis, can be considered as a basis for the Bank's participation in the financing of the foreign exchange costs.

TABLE V

<u>Project</u>	Estimated Foreign Exchange Costs to be Financed by the Bank <hr/> (U.S.\$ Equivalent) (000 omitted)
1. Thal Colonization	2,100
2. Lower Sind Barrage	7,947
3. Drainage in East Bengal	6,500
4. Grain Storage	<u>2,100</u>
Total	<u>18,647</u>

C. RAILWAY REHABILITATION

Railway Project

(a) Description of the Project (Government of Pakistan priority - 3)

124. Pakistan's rail transport facilities, comprising the East Bengal Railway in East Pakistan and the Northwestern Railway in West Pakistan, are badly run-down, and the equipment largely over-age. The situation is serious and is particularly acute in East Bengal. It is the result of:

- (i) insufficient renewal and repair of motive power, rolling stock, ties and track during and since the war;
- (ii) the loss, because of Partition, of vital repair facilities such as carriage and wagon shops and locomotive sheds;
- (iii) the dislocation, also because of Partition, of traffic patterns, which forced the line feeding Chittagong to carry goods formerly moved through Calcutta; and
- (iv) the exceptional wear and tear on equipment and track from the military traffic during the war, and refugee traffic after Partition.

125. The impact of these factors has been intensified by shortages of skilled personnel arising out of the interchange of population between India and Pakistan.

126. The deterioration of Pakistan's railroads is reacting on her immediate productive efficiency and threatens, unless promptly corrected, to hold back her economic growth. About three-fourths of the goods shipped through Chittagong and almost all those through Karachi are rail-hauled. Along the congested line out of Chittagong, in particular, roughly 1.3 million tons of traffic comprised of jute, food grains, coal and general merchandise is currently moving with prolonged and costly delays. Even if the workload builds up by only 15 to 25% over the next few years, it is essential to improve present facilities and rehabilitate both equipment and track in order to haul this amount of traffic efficiently and economically. In West Pakistan, existing facilities are somewhat more adequate for the current traffic, but rehabilitation is needed, particularly if the expected expansion of agricultural and industrial production is to be properly served.

(b) Estimated Cost

127. According to the Colombo Plan, the Pakistan Government plans to spend Rs. 200 million for railway betterments during the next six years. It has requested Rs. 163.7 million (equivalent to about \$49.1 million) from the Bank for equipment imports during the next three years and has recently sanctioned the expenditure of Rs. 50 million from the railway depreciation reserves.

128. The proceeds of the requested loan from the Bank would be allocated as follows:

Diesel-electric locomotives	\$17.3 million
Boilers for steam locomotives	4.6 "
Carriages	12.0 "
Wagons	4.8 "
Workshop equipment	2.5 "
Ties	7.9 "
Total	\$49.1 million

Almost \$27 million worth of these imports would go to the Northwestern Railway, and \$22 million worth to the East Bengal Railway.

(c) Comments

129. It appears that a six-year program for the rehabilitation and improvement of the East Bengal and Northwestern lines would require much larger expenditures than the project before the Bank. It would necessitate additional outlays for rails and other improvements to the permanent way of both lines and the East Bengal line in particular. The Pakistan Government's proposal, as submitted to the Bank, is thus only a part of a bigger problem which will require careful planning in order to assure a well-balanced, coordinated and economically executed program.

130. The Northwestern Railway has already converted nearly two-thirds of its steam engines to oil and has placed orders for 23 new diesel-electric locomotives in the United States. These steps are justified by the relatively high cost of coal, both from India and elsewhere and the economies derivable from diesel locomotives. The East Bengal Railway has also started converting steam engines to oil and has requested bids for diesels.

131. Foreign exchange savings from the import of oil instead of coal and economies in the operation of diesel electric engines instead of oil-burning steam engines, are no doubt obtainable. However, the lack of repair facilities and experience in the operation and maintenance of diesel electric locomotives throughout Pakistan makes it advisable to limit the initial dieselization to 23 engines for West Pakistan. There are in West Pakistan shop facilities and operating conditions which are better adapted to the development of a diesel operation. Eliminating the diesel-electric engines for the East Bengal line will reduce, roughly by one-third, the estimated cost of repair shop facilities as set forth in the loan request.

132. The necessary import of freight cars for the East Bengal line, can also be reduced substantially by bringing back into service several hundred meter-gauge wagons which are presently being used as living quarters for railway personnel.

133. Part of the total request for new passenger coaches might well be deferred pending closer study of the types which would do the most good in the specific circumstances of East Bengal and West Pakistan passenger traffic.

134. New workshop equipment is evidently needed both to rehabilitate and modernize existing equipment. In order, however, to determine amounts and types, a special survey of the shops appears advisable.



135. Considering the world shortage of steel, the amount of steel needed for track renewals and the possibility of substituting wooden for steel ties, it is believed advisable to reduce the loan request from a 3-year supply of ties to a 12-month supply. This should provide time in which to investigate the possibility of obtaining and the feasibility of treating wooden ties locally.

136. In spite of the disruption resulting from Partition, according to the Railway Department's reports, the railways are operating at a considerable profit. According to these same reports, the gross revenues are derived about equally from passengers and freight. The passenger and freight rates appear to be about the same as those in India with passenger rates relatively low and freight rates relatively high. No balance sheet figures have as yet been made available to the Bank.

137. The management of the railways has made great efforts to overcome the defects in the physical and organizational aspects of the railroads resulting from Partition but there is much yet to be done. The task ahead appears to be too great for the relatively few experienced men in positions of responsibility.

(d) Conclusions

138. A preliminary technical review indicates that the program and costs shown in Table VI below appear to provide a reasonable basis for considering the Bank's participation in the financing of the foreign exchange cost of the rehabilitation of Pakistan's railways.

Table VI

<u>Purpose</u>	<u>Amount Requested</u>	<u>Amount Recommended</u>	
	(000 omitted)		
Diesel-electric locomotives	\$ 16,800*	\$ 4,750	(NWR only)
Diesel switching engines	500	500	(EBR only)
Locomotive boilers	4,600	3,000	(EBR only)
Carriages	12,000	3,000	(NWR and EBR)
Wagons	4,800	3,200	(NWR and EBR)
Workshop equipment	2,500	1,700	(EBR only)
Ties	<u>7,900</u>	<u>2,650</u>	(NWR and EBR)
Total	<u>\$ 49,100</u>	<u>\$ 18,800</u>	
Foreign exchange already expended		<u>1,100</u>	
Balance		<u>\$ 17,700</u>	

\* Estimated

139. Any financial assistance from the Bank should be made conditional on appropriate representations by the Government of Pakistan, including undertakings:

- (i) that a thorough program of rail renewals and track rehabilitation will be carried out simultaneously with the modernization of motive power and rolling stock.

- (ii) that a specialized engineering firm, satisfactory to the Bank, will make a survey of the East Bengal Railway shops and provide a list of the equipment needed.

The Bank should also strongly recommend that the Pakistan Government should employ a group of experts, satisfactory to the Bank, to investigate, report on and make recommendations concerning the organization, operation, traffic, and technical and financial aspects of the railways.

D. INDUSTRIAL PROJECTS

General

140. At the time of Partition Pakistan had very few industrial establishments. Since Partition some cotton textile mills and a few miscellaneous plants, including sugar and flour mills and tanneries, have been established in West Pakistan, and several jute baling presses in East Bengal, but industry is still poorly developed.

141. Currently Pakistan exports only agricultural raw materials and imports products manufactured from them, e.g. cotton textiles, paper, jute sacking, etc. There is a large domestic market and it is evident that the need for domestic industry will become more pronounced as the income of the population increases.

142. The industrial projects proposed by the Pakistan Government are either for the processing of fibers (cotton, jute and wool), which are currently the country's major exports, or of other raw products available domestically in abundance but not yet exploited.

143. The total investment for the proposed paper, jute and cotton mills is estimated at Rs. 122 million (equivalent to about \$36.6 million) and the foreign exchange investment is estimated at Rs. 75 million (equivalent to about \$22.5 million), all but an insignificant part of which consists of soft currencies.

144. All of the production of the paper and cotton mills and over 40% of the jute mills' production will be sold domestically. Moreover, the annual foreign exchange earnings and savings on this investment are estimated at roughly Rs. 71 million (equivalent to about \$21.3 million), which nearly equals the original foreign exchange investment. Of these annual foreign exchange earnings and savings, roughly Rs. 30 million (equivalent to about \$9 million) or 42% are expected to be in hard currency.

Industrial Projects Submitted for Bank Consideration

145. The following table lists the industrial projects submitted to the Bank and the estimated total cost and foreign exchange component:

TABLE VII

Government of Pakistan Priority	Projects	Total Cost		Foreign Exchange Component		
		Rupees	\$ equiv.	Rupees	\$ equiv.	% of total
		(In thousands)				
5	Paper Mill	40,000	12,000	25,700	7,710	64
6	Three Jute Mills	67,500	20,250	42,500	12,750	63
12	Cotton Mill in East Bengal	15,000	4,500	7,000	2,100	47
15	Woolen Mill	2,400	720	1,250	375	52
	Fertilizer Factory	-	-	-	-	-
	Mechanization of Makerwal Colliery	-	-	-	-	-
	Total	124,900	37,470	76,450	22,935	61

East Bengal Paper Mill

(a) Description of the Project (Government of Pakistan Priority - 5)

146. The East Bengal Paper Mill is designed to use bamboo in the Chittagong hill districts for the manufacture of fine writing and wrapping papers. The site is located on the Karnaphuli River about 30 miles upstream from Chittagong. At this point the salinity of the Karnaphuli River ceases and the mill can get a supply of fresh water.

147. The mill was originally conceived as producing 100 tons of paper per day but this has been reduced to 90 tons per day or 27,000 tons per year. This output will be provided by three machines, two of 45 tons and one of 15 tons daily capacity, with space for an additional 45-ton machine when required.

148. This project has been very thoroughly and carefully investigated by a Canadian and a Swedish firm who wrote reports on it. On the basis of the design as revised by the Ministry of Industries, bids have been received on all the machinery, and most of the major items have been contracted for. It is expected to be completed by early 1953.

149. The construction of the mill will be under the direction, at the moment, of a special department in the Ministry of Industries which will be headed by Mr. Khursheed Ali, who will manage the project when completed. While the financing is now being provided directly by the Government, the final disposition and operation of the mill has yet to be determined. It is planned, however, to transfer the mill to the Industrial Development Corporation of Pakistan which would own and operate it through a subsidiary corporation.

150. The operating expenses of the mill, including its own steam generating plant, have been estimated by the Swedish group at Rs. 541 per ton, and by the Canadian group at Rs. 580 per ton. The Ministry of Industries estimates these expenses at Rs. 800 per ton compared with the present market price in West Pakistan of Rs. 1,350 to Rs. 1,400 per ton for paper of equal quality.

151. The Ministry proposes to sell the output of the mill at a price of Rs. 1,100 per ton, resulting in a net income of Rs. 8.1 million per year on an investment of Rs. 40 million.

152. The Rs. 800 per ton estimated as the cost of operation allows for 6% depreciation. This would result in the writing off of the investment in a little over 16 years.

(b) Estimated Cost

153. The estimated total cost is Rs. 40 million (equivalent to about \$12 million), of which the foreign exchange requirements are Rs. 25.7 million (equivalent to about \$7.7 million). Foreign exchange reported to have been spent as of about mid-January 1951 amounts to Rs. 12.25 million (equivalent

to about \$3.7 million). The foreign exchange costs yet to be expended are estimated to be Rs. 13.45 million (equivalent to about \$4.0 million).

(c) Comments

154. Paper of the quality to be manufactured by the mill is now being imported in the approximate quantity which the mill will produce. As the proposed price will be approximately 20% lower than the present market price of imported papers, there should be no question of the disposal of the mill's products. The mill can apparently be built within the limits of the present cost estimates. The operating costs have been estimated on a conservative basis assuming a reasonable amount of efficiency. The only major question remaining is whether a sufficiently experienced organization to construct and operate the mill can be recruited. Mr. Khursheed Ali is undoubtedly an experienced paper mill operator, and there are reported to be available evacuees formerly employed in the paper mills in Hyderabad (India).

(d) Conclusions

155. The project is financially sound and would apparently save about Rs. 27 million (equivalent to about \$8.1 million) in foreign exchange, of which nearly Rs. 3 million (equivalent to about \$.9 million) would be in dollars. The project appears worthy of consideration for the Bank's financing of the foreign exchange cost.

Project for Three Jute Mills in East Bengal

(a) Description of the Project (Government of Pakistan Priority - 6)

156. The objective of this project is to process part of the presently exported raw jute crop into sacking for domestic consumption and into hessian for export. This combined production is justified on the grounds (i) that raw jute is to be purchased in bulk and (ii) that it will not be economical to separate the grades and resell the higher only. The three mills are to include 1,300 looms for sacking and 1,700 looms for hessian with an estimated annual production of 28,000 tons of sacking and 37,000 tons of hessian, which is only about 10% of the subcontinent's exports of hessian.

157. Construction of the factory building for the first mill has been started and it is expected that this mill will come into operation in September 1951.

158. An important aspect of the project is the supply of power, stated as 10,000 kw. Power for the first mill is to be obtained from Dacca and from an existing power plant of a nearby cotton mill. Subsequent jute mills will be supplied from diesel stations to be installed by the East Bengal Government in Narayanganj, where all three mills are to be located.

(b) Estimated Cost

159. The capital cost of the three mills is estimated at Rs. 67.5 million (equivalent to about \$20.2 million), of which Rs. 42.5 million (equivalent to about \$12.75 million) is the foreign exchange requirement. Most, if not all, of this will be in sterling, as the equipment for the three mills was ordered

in the U.K. in the summer of 1950. Nearly Rs. 10 million (equivalent to about \$3 million) of the foreign exchange requirements were reported to have been expended as of about mid-January 1951. The foreign exchange costs yet to be expended are estimated to be approximately Rs. 32.5 million (equivalent to about \$9.75 million).

160. These three mills are being financed 51% by private firms and 49% by the Government of Pakistan which plans to transfer its investment to the Industrial Development Corporation when established.

161. The participating private firms have owned jute mills in Calcutta for many years and are experienced in the marketing of the products. The extent of their operating experience is not known, as their Calcutta mills have been operated by managing agents. An adequate number of skilled laborers can apparently be found among the Muslim immigrants from Calcutta.

(c) Comments

(i) General

162. Jute is the only cash crop of over half of Pakistan's population. Pakistan consumes finished jute products but has no manufacturing facilities.

163. In view of the world market situation, the hessian produced by these three mills could apparently be disposed of without serious effect on world prices of hessian. It is believed, however, that substantial expansion beyond the production level of three mills might unduly depress the world price of hessian and threaten one of the major objectives and the financial success of the project.

(ii) Estimated Earning Power

164. A detailed breakdown of estimated manufacturing costs has been requested and promised, but not yet received. The following rough estimates of overall costs have, however, been computed.

	<u>Sacking</u>	<u>Hessian</u>
Cost of raw jute per ton	*Rs. 500	*Rs. 600
Cost of manufacture per ton	350	550
Total	<u>Rs. 850</u>	<u>Rs. 1,150</u>

\*Reduced from estimated prices of Rs. 600 and Rs. 750 respectively, given in project request submitted by Pakistan, on the same basis as that stated below in regard to prospective selling prices.

165. With reference to selling prices, the project description estimates prices of Rs. 1,500 per ton of sacking and Rs. 2,000 per ton of hessian. These prices are on the level of those prevailing immediately prior to Korea and, therefore, do not reflect the extremely high levels prevailing today (around Rs. 3,500 per ton f.o.b. New York). In order to provide a firm base for the following estimate of the mills' earning power, a more conservative

price level is used here; namely, Rs. 1,200 for sacking and Rs. 1,500 for hessian, both of which correspond to the lowest prices of early 1949.

166. On the above assumptions, the annual earning power of the three mills may be estimated as follows:

<u>Sales</u> , less 3% for commission:	(000 omitted)
Sacking	Rs. 32,800
Hessian	Rs. <u>53,500</u>
Net Sales	Rs. 86,300
 <u>Production Costs:</u>	
Cost of raw jute, including	
5% for loss in process	Rs. 38,000
Manufacturing costs	Rs. <u>30,000</u>
Total production costs	Rs. <u>68,000</u>
Net Profit	Rs. 18,300

This net profit is 21% of net sales and 27% on the total investment of Rs. 67.5 million.

167. If this roughly estimated profit of Rs. 18.3 million (equivalent to about \$5.5 million) were used to repay the principal of a loan equivalent to the project's foreign exchange component, it would do so in less than two and one half years.

168. It is believed that these new mills will enjoy some cost and quality advantages from being closer to the best of the raw product than any of their competitors. They should also benefit competitively from the new efficient equipment, if adequately experienced management and operators are available.

#### (iii) Estimated Foreign Exchange Savings and Earnings

169. There is a tendency among those concerned with the project to plan on selling all the hessian in the dollar market. It is believed this could have a depressing effect on that market and that it would be advisable to sell half the hessian in non-dollar markets. On this basis, out of Rs. 53.6 million (equivalent to about \$16.1 million) of exports, half the hessian sales, or Rs. 27 million (equivalent to about \$8.1 million), are here taken as dollar sales.

170. No deduction in hard currency income need be made on account of the reduced exports of raw jute, as Pakistan could still satisfy that market by reducing raw jute exports to soft currency areas.

171. In the case of soft currencies, savings resulting from the elimination of sacking imports would be Rs. 33.8 million and exports of hessian to soft currency areas would be Rs. 27 million for a total gain in soft currency of Rs. 60.8 million. From this, Rs. 38 million has to be deducted for reductions in raw jute exports, and roughly 20% of the foreign exchange capital cost, or Rs. 8.5 million for interest, depreciation, spare parts, fuel, etc., for a total soft currency loss of Rs. 46.5 million and an estimated net soft currency gain of Rs. 14.3 million.

172. Thus, the foreign exchange net gain from these three jute mills may be estimated as roughly Rs. 14 million (equivalent to about \$4.2 million) in soft currencies and Rs. 27 million (equivalent to about \$8.1 million) in hard currencies for a total of Rs. 41 million (equivalent to about \$12.3 million).

173. These annual net gains in foreign exchange are equivalent to the initial capital cost of imported equipment (Rs. 42.5 million). All of this equipment comes from the sterling area, whereas Rs. 27 million, or 63% of the net foreign exchange savings and earnings, are in hard currencies.

174. No allowance is made here for additional foreign exchange which might well be forthcoming so long as prices are at their current high levels. (India now has an Indian rupee export tax of 1,500 per ton, compared with an internal wholesale price ceiling of about 2,000 Indian rupees per ton).

175. The jute mill project would make it unnecessary for Pakistan to import sacking, would increase her dollar earnings and provide her with some influence over price, production and quality policies affecting the long term competitive position of jute products. The importance of this competition from substitutes has become increasingly acute since the war when uncertainties concerning the prices and availability of jute products have loomed high in the eyes of consumers and stimulated the development and use of substitutes to a threatening degree.

(d) Conclusions

176. The project is worth considering for the Bank's participation in the financing of the foreign exchange cost.

177. Should this project be considered as a basis for a Bank loan, it would be necessary for the Bank to obtain

- (i) more accurate and detailed financial information including the financial and management arrangements made with the private participants, as well as assurances concerning the availability of power, and
- (ii) representations from the government regarding limitations on the future expansion of jute manufacturing.

Project for a Cotton Spinning Mill in East Bengal

(a) Description of the Project (Government of Pakistan Priority - 12)

178. This mill would furnish part of the yarn for the East Bengal weaving industry, which has some 250,000 hand looms with a capacity of 300 million yards of cloth requiring 60 million lbs. of yarn. In addition, there are 500 knitting machines in the hosiery industry, requiring 5 million lbs. of yarn. At present these textile "cottage" industries work at only one-third of their capacity because the supply of yarn from West Bengal has been disrupted as a result of Partition.



179. The capacity of the proposed mill would be 50,000 spindles, producing 9 million lbs. of yarn. It would put 36,000 hand looms into action and provide employment for about 50,000 workers in the over-populated area around Dacca. Furthermore, 2,100 laborers would be employed in the spinning mill.

180. The site originally proposed was at Chittagong, but a site near Dacca appears preferable as it is more nearly available to the cottage industry weaving facilities in the province.

181. It is intended to purchase the machinery and equipment in Japan or the U.K. Local funds would be raised from weavers' cooperatives and the Industrial Development Corporation.

(b) Estimated Cost

182. The estimated total cost (including a diesel power plant) is Rs. 15 million (equivalent to about \$4.5 million). Estimated foreign exchange requirements are Rs. 7 million (equivalent to about \$2.1 million).

(c) Comments

183. The operation of this project would require imports of a small amount of cotton from Egypt and the reduction of cotton exports from West Pakistan. This would reduce foreign exchange earnings in the amount of some Rs. 5 million (equivalent to about \$1.5 million) per year. On the other hand, the sales value of cotton yarn from the mill is estimated at approximately Rs. 11 million (equivalent to about \$3.3 million) at a price little below the present imported price. Thus, the saving in foreign exchange on yarn alone would amount to roughly the equivalent of \$1.8 million. This saving will in fact be slightly smaller because foreign exchange expenditures for imports of fuel and spare parts must be deducted.

184. Insofar as hand looms are put into operation and decrease imports of finished cloth, the saving in foreign exchange may be raised to the equivalent of between \$2.5 and \$3 million.

185. A calculation prepared by the East Bengal Directorate of Industries indicates that at the proposed price level and at the expected volume of sales the proceeds would cover operating expenses, interest, depreciation, and annual repayment of debt (contracted for the purchase of equipment) over a five year period.

(d) Conclusion

186. The project appears to be financially sound, would save foreign exchange and would provide employment for a large number of people. It is worth consideration for the Bank's participation in financing the foreign exchange cost.

Project for the Establishment of Woollen  
Industry in Northwest Frontier Province and Baluchistan

(a) Description of the Project (Government of Pakistan Priority - 15)

187. This project is for the construction of two woollen mills, one in the Northwest Frontier Province and the other in Baluchistan where large quantities of wool are produced. The plants would have 2,000 spindles each, and weaving capacity to process one-third of the yarn produced - the remainder being for cottage industries manufacturing woollen fabrics and rugs.

(b) Comments

188. At present, Pakistan exports 25 million lbs. of carpet wool; the consumption by the proposed mills would leave for export about 19 million lbs. At present the wool is sold at low prices largely because it is uncleaned and ungraded.

189. Instead of reducing their exports of raw wool by 25%, it appears advisable for Pakistan first to invest in the organization of markets and in the cleaning and the grading of the wool so as to improve the competitive position and price of Pakistan wool in the world market. The proposed project would not improve the price of wool to the sheep grower, nor the price of Pakistan wool in the world market, and might even reduce dollar earnings.

(c) Conclusions

190. It appears preferable for the Government of Pakistan to undertake a scheme to improve the quality of exported wool. Officials of the Government of Pakistan agreed with the Mission's conclusions and it is likely that the project will be withdrawn. In these circumstances, further consideration is unnecessary.

Industrial Projects for Immediate Consideration by the Bank

191. The following table lists the industrial projects which, according to preliminary technical and financial analysis, can be considered as a basis for the Bank's participation in the financing of the foreign exchange costs.

TABLE VIII

<u>Project</u>	<u>Estimated Foreign Exchange Cost to be Financed by the Bank</u> (U.S. \$ equivalent - 000 omitted)
1. East Bengal Paper Mill	4,000
2. Three Jute Mills in East Bengal	9,750
3. Cotton Mill in East Bengal	<u>2,100</u>
Total	15,850

E. PORT EXPANSION AND IMPROVEMENT

Port of Chittagong Project

(a) Description of the Project (Government of Pakistan Priority - 2)

192. The Port of Chittagong was originally designed primarily for the exporting of tea from the Chittagong and Sylhet areas. After Partition, with Calcutta remaining in India, Chittagong became the main port for East Pakistan, and has acquired an importance which originally was not expected.

193. The old port consists of berths for six ships and seven transit and storage sheds, together with the attendant railway assembly yards and railway spurs in the main part of the port. There are also a salt berth and two salt golas about 2,000 feet downstream from the main port location.

194. The capacity of the port, including extensions under construction, is estimated by the Pakistan Government at approximately two million tons per year, comprising both exports and imports, which compares with about 600,000 tons three years ago. Despite this rapid growth in capacity, the loading and unloading facilities of the port have been notoriously insufficient to handle the traffic. Until the latter part of 1950, ships were compelled to remain in the roadstead as long as two or three months before they could be berthed.

195. The project for the expansion and improvement of the port is based on a 1949 report of Merz Rendel Vatten to the Pakistan Ministry of Communications. The report provides for two four-year stages of development. The Ministry of Communications has altered this schedule and is attempting to increase the capacity of the port to nearly four million tons per year by 1953, including facilities for unloading nearly one million tons of coal.

196. The project as now planned follows the MRV report and includes 8 new berths (3 for salt and 1 for coal), new roads, bridges, railroad assembly yards and spurs, a substantial amount of land reclamation, several warehouses and transit sheds and a new office building.

197. At the time of the Mission's visit to the port, there were under construction and nearing completion four light jetties, two pontoon jetties, seven warehouses and three moorings (one for tankers and the other two for coal).

198. In an endeavor to keep pace with the increasing port capacity, some improvements have been made in the 125-mile single track line of the East Bengal Railway serving the port. The capacity of the tug and barge flotilla owned by the EBR has also been increased. Currently, there is a railway improvement program in process of execution which will lengthen existing sidings to accommodate up to 50% more trains of greater length, namely from 8 freight trains per day with about 45 wagons each to 12 trains of 60 wagons each. These railway improvements have not yet eliminated inordinate delays in delivery of goods between the port and inland points but they have made it possible to prevent an increase in the amount of goods held in storage at the port over the last year.

(b) Estimated Cost

199. The original report of the Pakistan Government, as submitted to the Bank, contains an estimate for expenditures during the years 1950-53 of Rs. 131 million (equivalent to about \$39.3 million), including a foreign exchange expenditure of Rs. 62 million (equivalent to about \$18.6 million). These estimates compare with MRV's estimate for the first four-year stage of Rs. 57.9 million (equivalent to about \$17.4 million) and Rs. 48.3 million (equivalent to about \$14.5 million) for the second four-year stage, totalling Rs. 106 million (equivalent to about \$31.8 million). The discrepancy between these two estimates is assumed to have been caused by changes in the MRV program and higher prices.

(c) Bank Assessment of Chittagong's required Port Capacity.

200. (i) Bank's Traffic estimates for 1949-51 (April to March)

	(Volume in 1000 long tons)	
	<u>1949-50</u>	<u>1950-51</u>
<u>Imports, general jetties</u>		
Food grains	200	150
Salt	100	100
General Cargo	300	300
Military equipment	<u>n.a.</u>	<u>n.a.</u>
Total	600 plus	550 plus
<u>Exports, general jetties</u>		
Jute	230	300
Tea	25	35
General Cargo	<u>70</u>	<u>85</u>
Total	325	420
<u>Imports, special facilities (moorings)</u>		
Coal	n.a.	600
Petroleum	<u>75</u>	<u>100</u>
Total	75 plus	700
Total imports and exports	1,000 plus	1,670 plus

Note: The first coal shipment arrived January 1950. In case of continued disruption of coal imports from Bihar, coal imports by sea are estimated at 720,000 tons annually.

(ii) Estimate of East Bengal Railway Enquiry Committee on traffic volume at Completion of 10-year plan. (Volume in 1000 long tons)

<u>Imports, general jetties</u>		<u>Exports, general jetties</u>	
Food grains	540	Jute	700
Salt	240	Tea	40
General cargo	<u>470</u>	General cargo	<u>160</u>
Total	1,250	Total	900

Imports, special facilities

Coal	n.a.
Petroleum	n.a.

Total imports and exports 2,150 plus fuel.

(iii) Remarks on Estimates of East Bengal Railway Enquiry Committee

Food grains: Imports of food grains in the amount of 540,000 tons through Chittagong would mean that East Bengal was suffering from an economic disaster of unprecedented proportions as normal grain imports for the Province may be assessed at 100,000 tons (wheat and some rice). However, it appears advisable to have available a reserve port capacity of 250,000 tons for grains.

Salt: It is quite improbable that salt consumption will rise to more than 150,000 tons annually.

Jute: The maximum exports of jute other than to India are assessed at 600,000 tons.

Fuel: A capacity for 300,000 tons of coal is desirable. No capacity for petroleum is needed as the Burma Shell Corporation provides its own facilities down the river from the main port.

The development of the port of Chalna may be expected to relieve Chittagong of 200,000 tons of jute (approximately the same amount as is now being exported in bond through Calcutta) and 300,000 tons of food grains, salt, and general cargo (250,000 tons of imports; 50,000 tons of exports).

(iv) Traffic estimates projected by Bank's technical staff for Chittagong and Chalna in 1960-61. (Volume in 1000 long tons)

<u>Imports</u>	<u>Chittagong</u>	<u>Chalna</u>
Food grains	250	100
Salt	100	50
General cargo	370	100
*Coal	300	-
Total	<u>1,020</u>	<u>250</u>

<u>Exports</u>	<u>Chittagong</u>	<u>Chalna</u>
Jute	400	200
Tea	40	-
General cargo	<u>110</u>	<u>50</u>
Total	550	250
Total imports and exports		<u>1,570</u> <u>500</u>

- \* This estimate is based on the assumption that (1) the Chittagong and Sylhet areas of East Bengal lying east of the Magna River require 300,000 tons of coal which can best be imported through Chittagong regardless of its point of origin; (2) the western part of the Province including Dacca and Narayanganj will obtain their needs of roughly 500,000 tons overland from Bihar; (3) if (2) does not materialize, moorings or pontoon jetties could be added at Chittagong or Chalna.

(c) Port Capacity and Seasonal Fluctuations

201. In order to assess the desirable facilities of a port, seasonal fluctuations must be taken into account and for the ordinary port a 25% allowance for this factor is deemed adequate. A capacity of 2 million tons annually would exceed the estimated annual traffic through Chittagong during the next 10 years by 25% to 35%. Thus, a capacity of 2 million tons for Chittagong and 600,000 tons for Chalna, including 300-400,000 tons of coal unloading facilities, would provide East Bengal with adequate port capacity for the foreseeable future.

(d) Comments

202. The above analysis of East Bengal's past and prospective foreign trade, including trade with West Pakistan, indicates that the province will have about 1.3 million tons of imports and .8 million tons of exports in 1960-61 and that this trade in East Bengal can be handled by the two ports of Chittagong and Chalna.

203. The Port of Chalna, which opened on December 17, 1950, consists essentially of moorings for seagoing ships loaded and unloaded from river barges. It is located on the Pusur River, about 30 miles downstream from Khulna, where the offices of the government and shippers are situated. The port is estimated to have 500,000 tons of capacity and will handle principally jute exports and grain, salt and general cargo imports.

204. Thus an expansion of the Port of Chittagong to a total capacity of 2 million tons and the existence of Chalna with a capacity of half a million tons, or a total port capacity of 2.5 million tons, should be sufficient capacity to handle the annual estimated overseas trade of 2 million tons. It should be noted that with this capacity there will be no need for shipments in bond through the port of Calcutta.

205. The Port of Chittagong is administered under divided authority. While the Port Commissioners are charged with the responsibility of maintaining and operating the facilities in the harbor, the operation of shore facilities is under the administration of the East Bengal Railway. As a result, until a year

ago no separate account classification for the port had been set up on the railway books and port revenues and expenses were charged to railway accounts; consequently, no analysis of the port's finances was possible. A year ago an account classification to segregate the port expenses and revenues from those of the EBR was set up. No capital account classification with respect to the port, however, was in existence last November and capital expenditures were still being charged to railway capital accounts. (According to recent information this has now been changed).

206. Under the original act which initiated and created the Port of Chittagong, the Port Commissioners were given the legal responsibility for the operation of the port. However, over the years, the operation of the port has passed into the hands of the East Bengal Railway, in spite of the fact that this is legally questionable.

(e) Conclusions

207. In these circumstances it is considered that Pakistan would be well advised to modify substantially the project submitted to the Bank and to revise it on the basis of an annual capacity of approximately 2 million tons instead of 4 million tons. Should the Government of Pakistan decide to revise the project in accordance with this recommendation and to establish a sound administrative organization the Bank might then consider the financing of the foreign exchange cost of the revised project.

F. TELECOMMUNICATIONS AND RADIO REHABILITATION AND IMPROVEMENT

Telecommunications and Radio Project

(a) Description of the Project (Government of Pakistan Priorities 16 and 17)

208. The telecommunication system which existed in Pakistan at the time of Partition was primarily designed to furnish telephone service to the British Military, Higher Civil Administrators and a few merchants and land-owners. The general public and lower officials were served by a low grade telegraphic network reaching most of the developed area. Except for the Karachi - Lahore link main axes were oriented on Bombay, Delhi and Calcutta. The small amount of traffic between what are now East and West Pakistan circulated via Delhi and Calcutta. International traffic circulated via the Cable and Wireless (British) cable centers in Karachi, Madras and Bombay and the radio center in Bombay which was the outlet for all of India.

209. Most of the competent technical personnel were British or Hindu who left for England or India after Partition. All fabricating, assembling and maintenance facilities were located in what is now Indian territory.

210. The few officials and engineers who came to Pakistan were relatively inexperienced and have been unable to maintain and operate properly the existing system, due to the almost complete lack of maintenance equipment, parts and skilled workmen. Moreover, the Post and Telegraph Directorate has had to meet greatly expanded local requirements in Karachi and Dacca, both of which have been raised from minor provincial to major administrative centers. The provision of new services between East and West Pakistan and between Pakistan and other countries has also become necessary.

211. The loan requested is to provide equipment for the services offered by the Telecommunication Branch of the Post and Telegraph Directorate of the Ministry of Communications. This organization is charged with the erection and maintenance of all telegraph and telephone lines and wires, including those leased and used by departments of the Central and Provincial government departments.

212. Pakistan is severely handicapped by slow, uncertain and unreliable telecommunications services; (i) her foreign exchange earnings are being reduced directly by annual sterling payments to foreign communications operators and indirectly by the inability of export-import merchants to be in close, immediate contact with world commodity markets; (ii) her agricultural producers have no prompt, certain knowledge of market prices and their fluctuations; (iii) her crops suffer from excessive exposure to serious wastage by floods, storms, and other extreme weather conditions because of the lack of forewarnings; (iv) for want of adequate means to receive and transmit messages quickly, the administrative processes, including law and order, of the Central and Provincial Governments are weakened; (v) the railways are impeded in their control of train movements and traffic routing since they are dependent on Post and Telegraph facilities for



communications by wire; and (vi) the river transport fleet in East Bengal is rendered less efficient and more costly by the lack of communications for traffic and operational messages.

(b) Estimated Cost

213. The following table shows the estimated cost and foreign exchange component:

	<u>Total</u>		<u>Foreign Exchange</u>	
	<u>Rupees</u>	<u>\$ equiv.</u>	<u>Rupees</u>	<u>\$ equiv.</u>
	(000 omitted)			
Telecommunications	80,155	24,047	38,700	11,610
Radio services	8,755	2,626	4,015	1,204
Total Rs.	88,910	\$26,673	Rs.42,715	\$12,814

(c) Comments

214. A major cause of the poor communications services in Pakistan is a lack of experienced personnel in top administrative and technical positions, as well as inefficient use of the talent available due to the dispersion of communications activities among thirteen separate departments of government. Moreover, (i) the operating equipment is in bad order and is continuing to deteriorate due to inadequate maintenance and a lack of maintenance facilities; (ii) operating techniques are obsolete; (iii) there are insufficient circuits where traffic pressure is heaviest; and (iv) there is a serious shortage of skilled manpower.

215. The most urgent steps toward providing Pakistan with better telecommunications are to (i) provide experienced management; (ii) centralize control over telecommunications into one agency; (iii) overtake maintenance arrears; (iv) devise more efficient operating techniques and repair facilities; (v) establish proper maintenance; (vi) train qualified technicians, operators and mechanics. These steps are required to prevent further deterioration, as well as to improve the present condition of the system. Some immediate expansion is also urgently needed.

216. A factor that aggravates the situation is the fact that government departments other than Post and Telegraph are permitted to own, operate and maintain circuits in places where P. & T does not provide reliable wire service. In consequence, eight other agencies of the Central Government, including the military, together with the police and public works departments of the four provinces and Baluchistan, have established approximately 20 international and 338 domestic circuits. These circuits use an estimated total of 644 radio transmitters and serve approximately 150 points not served by P. & T. The remaining 188 circuits serve locations where P. & T. have inadequate facilities. Most of the equipment used by non-P. & T. agencies is war surplus. It is rapidly wearing out and does not meet the band-width and stability of emission standards prescribed in international regulations.

217. If the limited equipment and trained personnel were centralized in a single organization, the governmental agencies and the general public would receive better and cheaper communications services. This organization should take the form of a government-owned corporation responsible to a cabinet board which would determine the general policy and service requirements. The management of the corporation would be charged with operational and technical responsibility.

218. The reorganization will require a strong management group who should be free to make decisions based on long range policy considerations and not on short range economic and political influences. To head this group there is required a technically qualified person with administrative experience and prestige. The Government of Pakistan should be urged to select a management group consisting of, say, eight individuals competent both as engineers and as administrators. This group will have to be recruited outside Pakistan and their services will be required for a period of from two to five years. It is estimated that the foreign exchange cost for their salaries during the five-year period will be approximately the equivalent of \$385,000. In addition to assisting in the establishment of the proposed organization, this group should (i) prepare and submit at the end of two years a long range plan for the development of communications in Pakistan; and (ii) select proper equipment and develop assembly facilities in Pakistan.

219. It is estimated that it should be possible to improve the utilization of the present plant by from 50% to 100% by inaugurating operational, maintenance and technical training programs. For this purpose, it is considered necessary to supply twelve additional non-Pakistani technicians to serve as instructors and supervisors for periods of from one to two years at a cost equivalent to about \$127,500.

220. To put the existing plant in proper condition and to provide for a small expansion of services to meet urgent requirements, it is estimated that expenditures for maintenance, material and equipment needed during the next two or three years will amount to the equivalent of at least \$1,937,000. To pay for experienced management, engineers and instructors, an additional expenditure of approximately \$513,000 would be required over the next five years.

221. It is considered that the only practical course for Pakistan is to purchase simple, inexpensive and non-automatic equipment. This will make it possible to have a shorter training program with more satisfactory results.

222. Table IX below represents the estimated foreign exchange cost of a project which could be considered as a basis for financing by the Bank.

TABLE IX

Estimated Foreign Exchange Cost

(Dollar equiv. - 000 omitted)

By Years	*Requested (Equipment only)	Recommended			% of requested Foreign Exchange Recommended
		Equipment	Management & Training	Total	
1st Year	\$ 1,042	\$ 520	\$ 86	\$ 606	58
2nd Year	1,851	850	166	1,016	55
3rd Year	2,577	567 <u>1/</u>	139	706	27
4th Year	3,303	-	72	72	2
5th Year	<u>4,041</u>	-	<u>50</u>	<u>50</u>	<u>1</u>
Total	\$ 12,814 <u>2/</u>	\$ 1,937	\$ 513	\$ 2,450 <u>3/</u>	19

\*Does not include estimated cost of \$1 million for maintenance and assembly facilities contemplated under 6 year plan and which will be partially met under proposed plan.

- 1/ Represents equipment ordered but not delivered during the first two years.
- 2/ This \$12,814,000 requested is divided \$8,707,000 in pounds sterling and \$4,107,000 in dollars.
- 3/ Of this \$2,450,000, \$1,349,000 will probably be in pounds sterling and \$1,101,000 in dollars.

By Type of Service	% of		% of		Estimated % of Accomplishment <u>1/</u>
	Requested	Total	Recommended	Total	
East-West Link	360	2.6	173	7.0	48
International	425	3.1	269	11.0	63
Maritime	63	.5	181 <u>2/</u>	7.4	287
Domestic Telegraph	1,143	8.3	348	14.2	30
Training and Test Facilities	50	.3	153	6.2	306
Maintenance & Ass- sembly Facilities*	1,000	7.2	330 <u>3/</u>	13.5	33
Intercity Telephone	1,530	11.1	423	17.3	28
Local Telephone	8,163	59.1	573	23.4	7
Staff Quarters	<u>1,080</u>	<u>7.8</u>	<u>0</u>	<u>.0</u>	<u>-</u>
Total	13,814	100.0	2,450	100.0	18

\* Not included in original request for loan.

- 1/ Estimated accomplishment with recommended funds expressed as a percentage of estimated accomplishment with requested funds.
- 2/ This reflects 30% increase in equipment cost which has occurred since Korea and is not included in the requested estimates.
- 3/ This expenditure should reduce the foreign exchange cost of communication equipment from its present value of 47% of the installed cost to at least 35%.

223. The figures for the year ended March 31, 1949, the only full year since Partition for which audits have been made, show that the telecommunications branch of P. & T. had a profit of approximately Rs. 10 million (equivalent to about \$3 million). Profits of this size would be more than ample to finance the local currency portion of the suggested five-year program if they were made available for it.

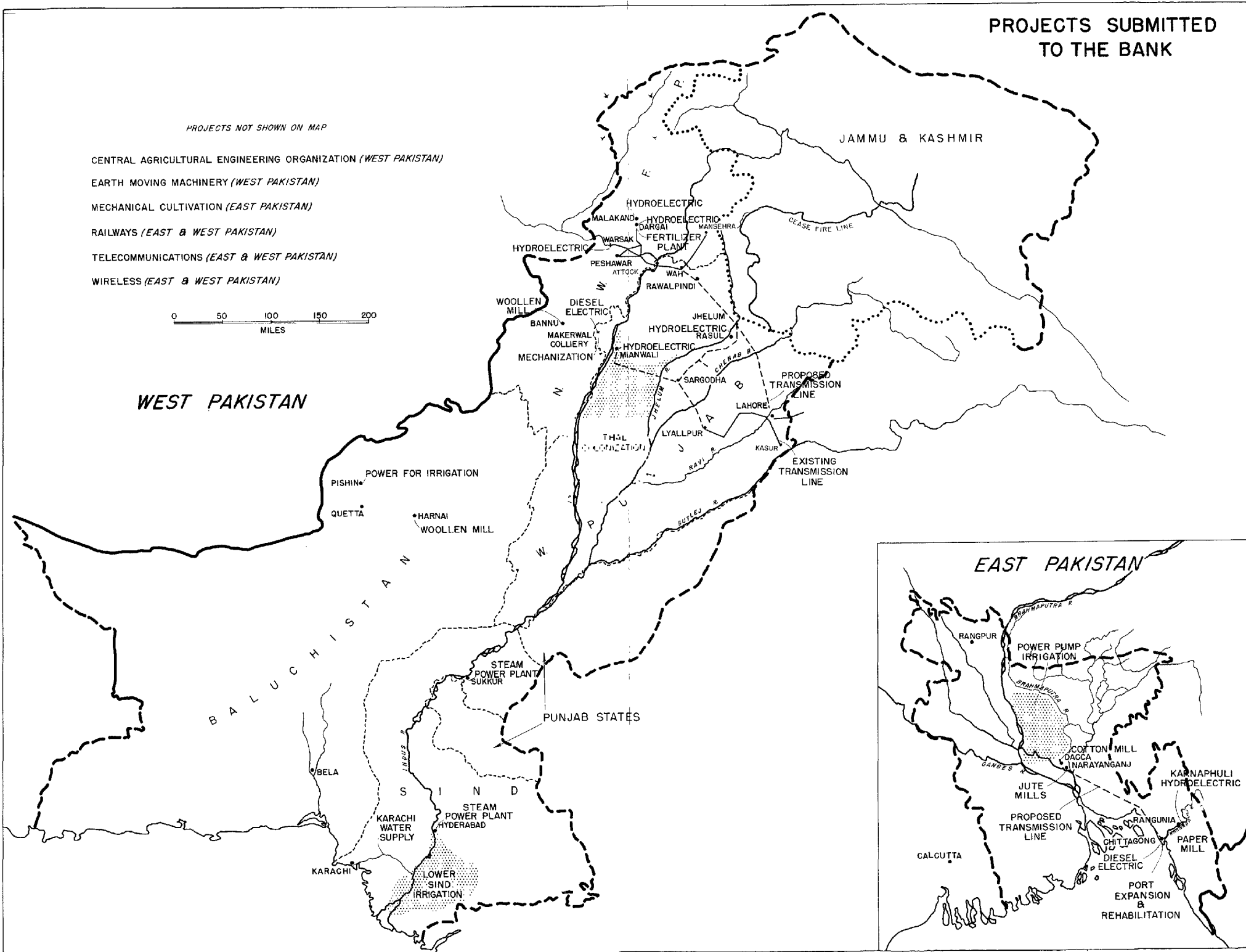
(d) Conclusions

224. The project appears worthy of consideration for the Bank's participation in the financing of the foreign exchange cost. It is believed that the Bank should make its participation conditional upon (i) the appointment of foreign management and technical groups; and (ii) the reorganization and centralization of control over telecommunication operations in a single government-owned corporation.

# PROJECTS SUBMITTED TO THE BANK

PROJECTS NOT SHOWN ON MAP

- CENTRAL AGRICULTURAL ENGINEERING ORGANIZATION (WEST PAKISTAN)
- EARTH MOVING MACHINERY (WEST PAKISTAN)
- MECHANICAL CULTIVATION (EAST PAKISTAN)
- RAILWAYS (EAST & WEST PAKISTAN)
- TELECOMMUNICATIONS (EAST & WEST PAKISTAN)
- WIRELESS (EAST & WEST PAKISTAN)



WEST PAKISTAN

EAST PAKISTAN

Railways and Communications

I. Railways (operating year 1949-50)

<u>Item</u>	<u>Total</u>	<u>West Pakistan</u>	<u>East Pakistan</u>
Route Mileages: Broad guage (5'6")	5,062	4,562	500
Metre guage	1,418	318	1,100
Narrow guage(2'6")	502	482	20
Total	<u>6,982</u>	<u>5,362</u>	<u>1,620</u>
Gross revenue: Passenger (Millions of Rupees)	185.6	127.1	58.5
Freight (Millions of Rupees)	183.8	120.6	63.2
Passengers carried	117,793,000	68,669,000	49,124,000
Passenger miles	5,253,915,000	3,686,115,000	1,567,800,000
Freight ton miles	2,281,049,000	1,767,737,000	513,312,000
Locomotives in service	1,201	771	430
Coaches in service	3,865	2,372	1,493
Freight cars in service	37,041	23,280	13,761

II. Communications (1950)

Cities with telegraph service	791	474	317
Cities with telephone exchanges	110	94	16
Cities with public call telephones only	30	19	11
Number of telephones	18,575	16,202	2,373
Telephone line mileage	24,945	20,111	4,834
Gross revenue (millions of rupees) <sup>1/</sup>	22.3	---	---

III. Roads (1950)

Concrete	5,574	4,890	594
Macadam	2,355	1,327	1,028
Dirt	50,055	<u>29,883</u> <sup>2/</sup>	<u>20,172</u>
Total	<u>57,984</u>	<u>36,180</u>	<u>21,794</u>

<sup>1/</sup> Operating year 1948-49.

<sup>2/</sup> Does not include caravan routes which are numerous in West Pakistan.

# RAILWAYS AND COMMUNICATIONS

## RAILWAYS

- ==== BROAD GAUGE (5'6") DOUBLE TRACK
- BROAD GAUGE (5'6") SINGLE TRACK
- METRE GAUGE - SINGLE TRACK  
NARROW GAUGE (2'6") OMITTED

## COMMUNICATIONS

- TELEGRAPH OFFICE
- TELEPHONE EXCHANGE OR PUBLIC CALL OFFICE

