

FUELS AND MINERALS

1. The development of modern industry, agriculture, transport and construction, such as has been taking place in this country, requires a rapid increase in supplies of fuels and mineral raw materials. At the time of independence nearly all the known sources of high grade coal and iron ore, bauxite and most other metallic minerals in the sub-continent were left in India. Known resources of fuels and minerals in Pakistan were negligible. Since then, there has been a considerable increase in the production of fuels and minerals within the country. There also has been some intensification of efforts to find additional deposits in large areas of the country which have never been thoroughly explored. The increase in domestic mining and production of certain fuels and minerals is shown in Table 1.

TABLE 1
Output of selected fuels and minerals in Pakistan, 1948—1956

Item	Unit	1948	1949	1950	1951	1952	1953	1954	1955	1956
1. Crude petroleum	Million imperial gallons.	17	33	45	47	55	62	68	72	74
2. Petroleum products :										
(a) Diesel oil	"	1·34	1·33	2·30	2·82	5·85	9·06	12·28	13·96	15·2
(b) Motor spirit	"	2·21*	6·11	10·42	11·16	15·10	16·95	19·08	19·41	19·8
(c) Kerosene oil	"	0·30*	0·99	2·06	1·83	2·32	2·39	2·83	2·80	4·6
(d) Furnace oil	"	6·52	15·19	24·50	25·19	23·75	27·67	25·85	25·48	25·1
3. Coal	Thousand tons.	241	332	437	506	599	584	554	533	646
4. Chromite	"	18	17	18	18	17	23	22	29	23
5. Limestone	"	347	279	303	344	672	879	822	887	756
6. Gypsum	"	—	14	17	23	28	27	31	27	35

*Data relates to 9 months (April 1948 to December 1948).

Source : (1) Ministry of Finance : Economic Survey and Statistic
(2) Central Statistical Office.

2. Domestic production of fuels and minerals has not been enough to satisfy the demand. Many important minerals, including iron ore, have not been produced at all. Only about 33 per cent. of coal consumption and 20 per cent. of consumption of petroleum products in 1954 came from indigenous sources, the balance of the country's requirements being imported on the scale shown in Table 2. On the other hand, the country has been nearly self-sufficient in salt, ceramic clay, limestone and gypsum. Chromite has been exported, but very few other minerals, and no fuels at all. Consequently very heavy net expenditures of foreign exchange have been made to import coal, petroleum products, metals, chemicals and many other needed materials not mined or produced in the country.

TABLE 2

Imports of fuels into Pakistan 1950—1956

Item	Unit	1950*	1951	1952	1953	1954	1955	1956
1. Petroleum products	... Million imperial gallons.							
(a) Diesel oil	... ..	6.45	19.80	30.27	33.64	40.90	59.1	41.5
(b) Motor spirit	... ..	5.34	14.55	22.85	13.89	24.11	14.1	7.6
(c) Kerosene oil	... ..	18.31	37.92	30.53	54.83	41.87	46.7	34.2
(d) Furnace oil	... ..	33.03	79.42	129.27	123.08	115.05	117.3	39.5
2. Coal	... '000' tons	1,009	1,366	1,667	1,192	1,101	1,061	1348

*Figures are for six months, *i.e.*, July—December, except for coal which are for full year.

Source : (1) Central Statistical Office.

(2) Coal Commissioner Office.

Imports of fuels and raw materials cost us roughly Rs. 319 million in 1954, of which Rs. 75 million were spent for petroleum products and Rs. 34 million for coal. This is a sizable part of the import bill. It is clearly of great importance to find and develop larger domestic sources of these materials.

3. It is necessary to plan on the basis of a continued steady rise in fuel and mineral requirements as the development of the country proceeds. The discovery of the very large pools of natural gas at Sui and Sylhet will replace sizable quantities of fuel which otherwise would have had to be imported. By 1960, the country should be obtaining from natural gas the heat equivalent of more than 200 million gallons of imported fuel oil. Despite this, the demand for petroleum products is expected to rise so rapidly as to require larger imports in 1960 than in 1954.

4. The major objectives of a development programme for fuels and minerals are very clear: first, to push ahead rapidly with the exploration of subsoil resources, in order to find out exactly what exists and how it can be exploited; second, to assure the rapid development of all economically useful reserves, in order to supply as much as possible from indigenous resources and to increase foreign exchange earnings through exports.

EXPLORATION, PROSPECTING AND DEVELOPMENT

5. Not much is known about the mineral deposits in this country. Only about 28 per cent of West Pakistan and a small part of East Pakistan had been covered satisfactorily by geological mapping before 1955. The first essential for a sound fuels and minerals programme is to expand greatly the work of exploration. This requires an immediate and large increase in the work of the Pakistan Geological Survey.

6. The Geological Survey has a sound tradition of professional work, and a well-trained staff. Its current operations, however, need to be greatly expanded. The Survey should be required to prepare and execute well-defined programmes of work, intended to explore rapidly the most promising areas and to prospect for the most important minerals. For example, the Survey should concentrate for the next few years on (a) the unexplored mountainous portions of West Pakistan; (b) important minerals needed for the development programme, such as ores of non-ferrous metals; coal and lignite, oil and gas, potassium salts and phosphates, and high grade clays; (c) ores of metals which have promising export markets, such as tungsten, titanium, antimony, cobalt, columbium, beryllium and monazite.

7. To carry out such programmes, the Survey will need a considerably larger staff and a good deal of additional equipment for both laboratory and field work. The Government should be prepared to give the Survey much stronger financial support than in the past, in view of the great significance of geological exploration to the country's development. A very substantial contribution to geological knowledge has been made by the Canadian Government, which has financed an aerial survey of most of West Pakistan (south of the high mountains), a ground geological reconnaissance of the former Baluchistan and Baluchistan States Union, and reconnaissance soil surveys of considerable portions of the Indus plain. It will take many years to complete the work of finding out what quantities and qualities of mineral resources lie within the country.

Prospecting and development

8. Geological mapping yields information on the geological structure of different areas and on the general types and quantities of mineral resources. The next steps are detailed prospecting to map much more precisely the shape and size of the deposits, estimating the cost of recovery, and, where good results can be expected, commercial exploitation. In this country, as in most other countries, it is generally considered desirable that private companies should be encouraged, to provide the capital and take the risks of prospecting and developing sources of fuels and minerals, under standards and safeguards laid down by the Government to protect the public interest. Where special circumstances exist, such as the needs of national defence, or where private companies perform poorly, public enterprise may be preferred.

9. To obtain good results from private enterprise in fuel and mining operations, the Government needs a clear policy, offering strong incentives for rapid and thorough prospecting, and providing for prompt exploitation of valuable deposits under appropriate safeguards so as to prevent waste or monopolistic practices. Current policy needs improvement. The Central Government regulates the granting, renewal and revocation of prospecting licences and mining leases, operating and safety conditions, and other aspects of mining. Some of these regulations are out-of-date, and their administration has not always been prompt and effective.

10. Under present arrangements, information on possible deposits is often not published promptly and fully, with the result that businessmen do not know what opportunities may exist. The system of "certificate of approval" and "prospecting leases" is cumbersome, and frequently results on the one hand in superficial and wasteful exploitation of known deposits, and on the other hand in leaving promising sites untouched. Private concerns are often faced with uncertainty and long delays in obtaining the necessary permits and licences to start work. The standards necessary in the public interest should be clearly laid down. The administration of the mining laws is split among several separate departments and this hampers the development of uniform and consistent policies.

11. There is general agreement among those concerned with mining laws and regulations about the deficiencies of the present situation and how to set them right. Two major steps are needed: first, the establishment of a single agency responsible for the rapid development of fuel and mineral resources, and second, a thorough overhaul of the mining laws and regulations.

12. The Central Government has already decided to take the first step, by establishing a Bureau of Mines to which would be transferred many of the existing controls over mining which are now in separate departments. The Bureau of Mines will be responsible for issuing claims, licences and leases; for collecting and publishing information on all phases of the mining industry; for economic and technical studies and advice; for stimulating and assisting the progress and efficiency of the mining industry; for encouraging the participation of foreign capital in fuel and mineral development; for expediting the import and production of necessary mechanical equipment and spare parts; and for other activities designed to make the best use of the country's fuel and mineral resources for development. We believe that the establishment of a Bureau of Mines is urgently required and should not be delayed.

13. The second step, overhaul of the present mining laws and regulations, is equally urgent. If the Bureau of Mines is established immediately, its first task should be to study and recommend a modern, simple, and effective system for Government licensing for private mining operations. There are excellent models to be found—for example in France, as well as in the States of New York, Utah and California in the U.S.A. Competent technical advice could easily be obtained through one of the foreign aid agencies. If, however, the establishment of a Bureau of Mines is delayed we recommend that a special group should be put to work on this task at once, as it is a necessary preliminary step towards the general improvement of the mining industry.

Mining personnel

14. Until recently there has been no organised training for professional and technical workers in mining industries. In October, 1954, however, the School of Mines, Lahore College of Engineering and Technology started its first class. The first batch of mining engineers will graduate from this school in 1959 or 1960. It is estimated that the country will need upwards of 50 mining engineers to carry out the mineral development programme we have recommended. It is clear that for some time the mining industry will have to depend in large part on foreign experts, on Pakistanis trained abroad, and on geologists or civil engineers trained in mining techniques through a combination of training on the job and short experience in foreign mining schools and installations. As in other fields of engineering, it is especially important that young mining engineers should gain a thorough appreciation of manual labour and be able to live amid the discomforts and hard conditions of field work.

15. Training of professional specialists is not enough. There must also be trained foremen (*sirdars*) and other supervisors for various types of mining operations. In coal mining, there are a number of competent managers and foremen, trained in Indian mines, where the seams are wide in contrast to those prevailing in this country, which are narrow and irregular. A considerably larger number will be needed as coal production expands. It would be desirable to send a number of selected managers and foremen abroad for training in North Africa or other areas with narrow coal seams. On their return, some of these men should be selected as instructors for a school designed to improve the number and quality of supervisors in the mines. This school, which might be attached to the School of Mines at Lahore, should be designed to train supervisors and junior technical staff for other types of mining operations as well as coal.

16. Except for the workers in rock salt mines and oil and gas wells, full time semi-skilled and unskilled mining labour does not exist in this country. Instead, the typical miner is a part-time worker—a farmer, a herdsman, or a nomad—recruited under a contract labour system giving him no relationship with the mine owner or manager except through the labour contractor. This is a very unsatisfactory system from the standpoint of both the miner and the manager. It leads to much exploitation of workers and an irregular, inefficient labour force. Some improvement is noticeable wherever quarters (no matter how primitive and crowded) are available at the mine site or transport to the mine is provided; in such cases something resembling a regular labour force begins to emerge, even though there are no organised training programmes, and the productivity per man is very low.

17. Training is one of the several steps needed to improve the mining labour force. It is primarily the responsibility of the management, whether public or private, to see that the workers are better trained and better paid, to employ them directly rather than through contractors, and to improve their conditions of housing, health and safety. The Government agencies concerned with labour, health and housing should all play their part in improving conditions for mine workers. The main responsibility of the Government should be through the Bureau of Mines. The Bureau should study the whole problem of assuring a sufficient number of well-trained persons for the mining industry—managers, engineers, skilled and unskilled workers—and should plan and promote the necessary action, by both Government and private agencies, to meet these requirements. For this, the Bureau will need to have one or two specially trained persons who can devote their full time to the problems of mining personnel.

DEVELOPMENT PROGRAMMES FOR SPECIFIC COMMODITIES

Oil and gas

18. A good deal of the territory in both the Wings is of geological formations which show some prospects of containing oil and gas deposits. Exploratory work and drilling had gone on for many years, with positive results only on the relatively small fields near Rawalpindi, until large deposits of natural gas were found at Sui in 1952. Since then there has been considerable interest in oil and gas prospecting in the country, and several of the large international oil companies have invested considerable sums.

In the spring of 1955, gas was struck in an exploratory well being drilled near Sylhet in East Pakistan. Unfortunately a fire started, burnt the equipment and ruined the well. Later in 1955 gas was struck at a second well near the earlier site and further exploratory drilling is under way.

19. The Government has entered into agreements with several companies under which Government shares part of the prospecting costs, and will receive a share of the profits in addition to a royalty on any oil or gas produced. It is not possible to foretell exactly how much will be invested in oil and gas prospecting, but our estimate, for the plan period is Rs. 417.5 million, of which 80.8 million might be public and Rs. 336.7 million private.

20. The Punjab oil fields were developed some years ago, and a refinery was constructed at Rawalpindi. At present a pipe line has been laid from the fields to the refinery in order to collect and use natural gas, which was being wasted. No other sizeable new investment is expected in connection with the present producing wells. A small but steady increase in output during the Plan period may be assured.

21. The natural gas reserves at Sui and Sylhet are a very large addition to the country's fuel resources. The latest estimates of proven reserves at Sui (October 1955) are some 4,000,000 million cubic feet, roughly equivalent in heating value to 143 million tons of coal. Estimates of proven reserves at Sylhet are not yet available. By the end of 1955, gas was being delivered through a transmission line from Sui to Karachi, and by the end of 1956 total daily output of the Sui gas field was averaging about 25 million cu. ft. per day. The Plan provides (in the industries sector) Rs. 141 million for the construction of another 16 inch pipe line from Sui to Lahore via Multan. On the assumption that proven reserves of gas will be sufficient the Plan also provides Rs. 54 million for the construction of a ten inch pipe line 145 miles from Sylhet to Dacca, together with distribution facilities in Dacca.

22. The use of Sui and Sylhet gas should have a very large impact on the country's heat and energy supply, on industrial costs, and on the balance of international payments. The policies relating to the gas should be designed to reap the maximum benefit for the country. Hitherto, there has been no definite public policy on the rate of exploiting the gas, its proposed uses and the prices at which it should be made available; this is a serious handicap, in view of the importance of gas to the country. Our own conclusions on the allocation and use of natural gas are reflected in the Chapter on Large-Scale Industry; we have not, however, attempted a comprehensive study of these matters. We strongly recommend that the Bureau of Mines (or, if the Bureau's establishment is delayed, a specially assigned group) should be directed as a matter of urgency to study and submit proposals for Government policy on natural gas. The absence of such a policy is already causing uncertainty leading to waste of valuable resources. It may be noted here that the output of Sui gas at present is less than 70% of the output anticipated by the consultants who drew up the scheme for the transmission and utilisation of the gas. This may be due partly to delays and difficulties in converting using equipment to gas, and partly to the high price of the gas. The cost of gas is a little less than the price of alternative fuels, but the difference may not be sufficient to encourage maximum expansion in the use of the gas.

Coal and lignite

23. Coal is found in several places in West Pakistan, and lignite in East Pakistan. It is not possible to estimate the extent of the resources with any accuracy, because of lack of detailed mapping and prospecting. There are known to be sizeable deposits of coal at Makerwal in the former Punjab, and in the Sharig and Sor Ranges in the former Baluchistan and the former Baluchistan States Union, with further possibilities either at these sites or others, such as Jhimpir in the former Sind. One of the major elements in any development programme for coal is a systematic and persistent survey of deposits. It should be the duty of the Bureau of Mines, aided by the Geological Survey, to plan and execute this survey.

24. The most important consideration here is the very large savings in foreign exchange produced by investing in coal mining. Pakistan is at present importing over one million tons of coal each year valued at over Rs. 75 million. Import prices per ton range from about Rs. 60 for Indian coal up to Rs. 110 for coal shipped from China, (compared to local prices which vary from Rs. 35 to Rs. 70 per ton). We estimate that an investment of approximately 50 rupees is required to produce each additional annual ton of coal (under average conditions). This Rs. 50 is well below the foreign exchange expended on importing one ton of coal, which means that each rupee invested in the coal mining industry will save more than one rupee of foreign exchange each year, or more than 100% of the original investment. This is a much better saving than that obtained from investing in most industries, and coal mining should be given high priority by all concerned.

25. It is admitted that the quality of the coals found in the country is not good. The coals cannot be used for coking because they contain much sulphur and ash. The average heating value is about 10,000 BTU per pound, as compared with 12,000 BTU per pound of imported coal. However experience has shown that indigenous coal is satisfactory for use in boiler plants, if suitable firing arrangements are made. The soda-ash plant at Khewra, started in 1937, has always used it without difficulty. Beginning in late 1954, the North Western Railway too has been using it on the Quetta-Zahidan and Quetta-Chaman runs, and is ready to use much more of it.

26. There seems to be no doubt that a combination of habit, prejudice, and lack of clear-cut national policy has resulted in recent years in large imports of coal, at considerable costs in foreign exchange, to fulfil needs which could have been fulfilled economically by indigenous coal. We recommend that the Government declare their policy as being one of favouring the use of indigenous coal, wherever economic, and of supporting its development and conservation. To this end, the functions of the Coal Commissioner's Office or its successor in the Bureau of Mines, should be defined thus: first, to assist in increasing the output and improving the quality of indigenous coal; second, to encourage its increasing use in place of imports; and third, to authorise the importation of coal only to meet solid fuel requirements which cannot economically be met from indigenous supplies. This programme should be based on careful economic analyses of the relative costs and efficiencies of different types of local and imported coals for different uses, and of different types of coal in comparison with oil and gas as sources of heat for different purposes. This should be one of the first tasks of the proposed economic survey unit of the Bureau of Mines.

27. The mining equipment and methods used in most of the coal mines are extremely poor, even primitive. Steam or other mechanical shovels, drilling, undercutting, and material handling equipment are virtually unknown. Pumps, fans and electricity are rarely found. Explosives are seldom used. Even in relatively good and professionally managed mines, coal is moved and hoisted over steep grades in bags or baskets carried by men, without the aid even of ladders or steps. Donkeys are the standard substitute for conveyor belts or narrow gauge mine tubs. The limited mechanical equipment employed is usually obsolete, worn out, or unsafe. In these circumstances it is remarkable that more than half a million tons of coal have been raised annually in recent years.

28. The reasons for the lack of investment in better machinery and equipment are several. Mining equipment is not manufactured in the country and import licences have been granted only for small amounts and after

much delay, making it extremely difficult for mining companies to obtain essential equipment, supplies, spare parts, and replacements. Many mines are small and their seams are narrow and short, making mechanical equipment expensive and difficult to use. Many of the more highly mechanised types of equipment which have been developed in Europe and North America would not be economical in this country with its different ratio between capital and labour costs.

29. Over and above these reasons, and probably of greater importance, are certain aspects of the history of the coal industry. It has always suffered from a market instability. Since the turn of the century, there have been three or four periods of rising prices and rapid increases in output, followed by periods of low prices when most of the mines were closed down. Mine-owners have often followed the practice of making profits when they could, and re-investing little in the development of new capacity or the improvement of equipment. They have tended to regard the mines not as enterprises to be improved and developed over a long period of years, but rather as sources of occasional profits to be obtained at the lowest possible cost and with the minimum of investment. This is not a sound foundation for the long-term development of the coal industry. With a market larger than can be supplied, stretching far into the future, those who work the coal mines must establish long-term policies for their operation, maintenance and development.

30. This raises the question of the organisation of the industry. The small size and inadequate resources of many of the colliery companies have undoubtedly contributed to the poor condition of the mines. Although opportunities should be preserved for small entrepreneurs in this field, many of the existing units must be consolidated into larger ones which can be developed and operated more economically and efficiently. One such step has already been taken, by giving to the Pakistan Industrial Development Corporation responsibility for developing as a working unit several neighbouring mines at Makerwal, from which coal will be mined for a cement factory and a fertiliser plant. The same objective could be achieved by merging existing mines under private ownership. The Government should encourage private owners of the larger adjoining or related mines to merge them into strong companies, large enough to engage professional management and to support a consistent, long-range programme of investment in machinery and equipment. In such circumstances, it would be appropriate for the Government to make loans for the rehabilitation and development of the mines.

31. In conjunction with the Coal Commissioner and representatives of leading consumers, we have considered what target should be set for expanding the production and use of indigenous coal during the Plan period. We believe that an additional 500,000 tons could be used readily: about 300,000 tons in existing uses, including 100,000 tons on the railways alone in place of imported coal, and about 200,000 tons in new uses, including 150,000 tons in the cement and fertiliser factories at Daudkhel.

32. The Plan provides Rs. 29.3 million rupees for development of coal mining, of which Rs. 10 million is in the private sector. Approximately Rs. 25 million is required for expansion of output by 500,000 tons per year discussed above, and the balance of Rs. 4.3 million is to prepare for additional demands at the end of the plan period, such as for the iron and steel plant. At present PIDC have drawn up schemes totalling Rs. 17.7 million for developing Makerwal and Gullakhel Mullakhel mines in the former Punjab and former Baluchistan Collieries. Private mineowners have drawn up smaller schemes (these appear to be delayed due to non-issue of licences for import of equipment), and the PIDC is developing further schemes for the former Baluchistan area. High priority should be given to the implementation of these schemes.

33. East Pakistan has no proven coal deposits. There are, however, sizeable deposits of lignite, which have been partially explored and tested in recent years, with encouraging results. The lignite is found in easily mined seams only a few feet below the surface, although they could probably not be worked during the rainy

season. The water content is high, but air-drying makes it possible to burn the lignite satisfactorily in combination with coal, and further processing might give a fuel having even better characteristics. Because of the present dependence of East Pakistan on imported coal, it is important that the possibility of mining and using lignite on a sizeable scale should be fully investigated by means of a programme including:

- (a) Intensified prospecting and survey of deposits;
- (b) Determining appropriate mining techniques ;
- (c) Large-scale testing of samples to determine the best uses for the fuel; and
- (d) Preparing and executing a phased programme for the development and use of lignite.

The Bureau of Mines and the East Pakistan Government should both participate in these four steps and jointly work out the detailed schemes required. We have received no scheme covering lignite, but have included in the Plan funds to cover the first three steps listed above. When a scheme for actual development is ready, the additional funds needed should be provided.

Iron ore

34. Until recent years no commercially exploitable deposits of iron ore were known in this country. This situation has now changed greatly. Substantial reserves of medium quality ore—hematite, containing on an average 34 per cent iron—have been found near Kalabagh. Although the size of these reserves is still under investigation, there would probably be enough ore to support a medium sized steel plant. Some much higher quality ore—magnetite, containing about 62 per cent iron—is reported to have been discovered in Chitral. Even though the area is relatively inaccessible, the ore is of such high quality that it should be rapidly surveyed and means of exploiting it investigated. Finally, some relatively low-grade ore has been found near Jhimpir, 74 miles from Karachi near coal deposits. This ore should also be surveyed rapidly, and tests made of the techniques and costs of smelting it.

Chromite

35. About 22,000 tons of chromite are produced annually, all from the Hindubagh area, and all exported, principally to the United States. It may be possible to raise production and exports by 40 per cent during the Plan period. One major difficulty is the variable quality of the ore deposits—ranging from 30 to 57 per cent chromium oxide. To be exported at favourable prices, the ore must average 48 per cent chromium oxide. This calls for the blending of higher with lower grade ores and the present practice of each operator doing this separately is wasteful. What is needed is an export agency which could pool ores from different operators and obtain the largest possible quantities of suitable blends. The Government should sponsor such an export agency, either as a producers' co-operative or, if necessary, as a public or semi-public organisation. Recently, higher grade chromite has been discovered in kharan, this should be surveyed as a matter of high priority. In addition, a detailed scheme should be sponsored for processing some of the ore into sodium dichromate, which sells for a considerably higher price than ore. This scheme would probably show an attractive return on investment and prove a profitable undertaking.

Gypsum

36. There are large deposits of gypsum in West Pakistan. In the preplan period, only about 31,000 tons was used annually in making cement. With the increasing production of cement during the Plan period, this requirement will double and the fertiliser plant at Daudkhel will need another 80,000 tons of gypsum annually. A gypsum industry big enough to meet these larger needs might reach a level of efficiency in quarrying and transport which would enable it to enter the export market. The possibility should be investigated by the Bureau of Mines.

Sulphur

37. Requirements for sulphur in the country are at present fairly modest—about 6,000 tons annually; but they are certain to multiply in the next few years. Sulphur and sulphuric acid will be required for bleaching and chemical reaction—in such fields as rubber, insecticide, fertiliser, rayon and paper production. There are several sources of sulphur. High grade sands (40 to 60 per cent sulphur) exist in Baluchistan, and a small refinery has been established in Quetta to process them. Another source is coal; indigenous coals contain a high percentage of sulphur. Part of the process planned for the fertiliser plant at Daudkhel is to extract 1,500 tons of sulphur annually from the Makerwal coal and to use it for making fertilisers. Another potentially very rich source of sulphur is Sui gas; this sulphur will be extracted from the gas in the purification plant being constructed at the well-head, and it can be recovered for sale if that proves to be economically desirable. Finally, because gypsum can be used as a source of sulphuric acid its technological and economic possibilities should be explored as rapidly as possible.

Antimony

38. Antimony deposits in Chitral were worked some years ago, and then abandoned. Now again systematic prospecting and development work is under way, which should permit some exports during the Plan period.

Barytes

39. Finely-ground barytes are used as a lubricant in oil drilling and in paint manufacture. At present all the barytes used in the country are imported, though good quality deposits are reported in the former Sind and Baluchistan States Union areas. The Bureau of Mines should encourage the production of barytes in the country through private enterprise.

Salt

40. There are deposits of rock salt of excellent quality in West Pakistan, and its sea coast offers particularly favourable conditions for the extraction of salt from sea water by solar evaporation. East Pakistan has no rock salt deposits, and extraction of salt from sea water is carried on under much less favourable conditions. The mining of rock salt and salt extraction from salt lakes are government monopolies. Extraction of salt from sea-water is carried on as a private business under government supervision. The country has considerable natural advantages in salt production, and should become a net exporter of salt. In recent years, however, the country has actually been an importer. Since the devaluation of the rupee, it should be possible to export considerable quantities of salt to countries like Japan and Canada. The government agencies concerned, particularly the Ministries of Finance and Commerce, should urgently review these possibilities.

Limestone and clay in East Pakistan

41. East Pakistan in general is very short of stone. The only cement factory in East Pakistan, at Chattak, uses limestone imported from a quarry in India, just across the border. The Chandraghona paper mills also use limestone imported from India. Limestone, which used to be brought to Chattak for making quicklime in cottage industry operations, has been cut off by the new border. Even ordinary stone for making concrete or roads is extremely scarce. This creates a very special problem for the Geological Survey in East Pakistan and for the Provincial Government. It is important that the Province be surveyed rapidly—particularly the hilly sections—in search of limestone, construction rock and deposits of gravel. Until such deposits are found, the East Pakistan Government should explore the possibilities of developing sources in adjacent areas. A special contract should probably be made, to bring limestone to Chattak for cottage industry use as well as for the cement factory.

42. The most abundant mineral resource in East Pakistan is clay, which exists in many different qualities. Only ordinary loams and brick clays are used at present to any great extent. This represents a substantial unutilised resource, which should be developed. The equipping of the East Pakistan Glass and Ceramic Institute in Dacca should be completed without delay, and the Institute requested to conduct studies on the use of materials found in the Province.

ESTIMATED COSTS

43. The development costs summarised here are for major changes or expansions. We do not include the normal development work which is—or should be—a part of everyday mining operations, such as the exploratory work to identify new workings at a given mine site and prepare them for mining. The cost of natural gas pipelines is included in the Chapter on Industries. Table 3 below summarises the estimated cost of developing fuel and mineral supplies on the scale proposed during the Plan period.

TABLE 3

Estimated cost of development programme for fuels and minerals, 1955—60

(Million rupees)

Purpose	Public Sector	Private Sector	Total
1. Expanding Geological Survey	7.6	...	7.6
2. Establishing Bureau of Mines	0.5	...	0.5
3. Special high-priority investigations :			
Chitral (Magnetite) Antimony, etc.	8.4	2.7	11.1
Jhimpir (Coal and Iron Ore)	0.2	...	0.2
East Pakistan lignite	0.6	...	0.6
4. Prospecting for oil and gas	80.8	336.7	417.5
5. Expansion of coal production	19.3	10.0	29.3
6. Expansion of chromite production		0.6	0.6
7. Expansion of gypsum production (PIDC)	0.4	...	0.4
8. Processing of sulphur ore	0.4	...	0.4
9. Expansion of salt	0.8	...	0.8
10. Establishing Minerals Development Corporation (W. Pakistan)	5.0	...	5.0
	124.0	350.0	474.0

INDUSTRIAL DEVELOPMENT

1. Industrialisation is perhaps the most significant process in economic development. The purpose of economic development, in the circumstances of the country, is to execute and complete as rapidly as possible the transition from feudalism to industrialism. The community has to be lifted from a low to a high level of technique ; the method is predominantly one of industrialisation. The country needs to make the fullest use of its resources ; the processes of production need to be revolutionised to produce better and better goods in ever-increasing volume both for investment and consumption. The occupational structure of the country has to be strengthened and diversified to provide employment at increasingly higher levels of productivity.

2. Industry and agriculture support and complement each other. Special emphasis on agriculture is necessary in the Plan period to prevent the danger of imbalance between agriculture on the one side and an expanding industrial sector on the other ; to provide food for the increasing urban population and industrial labour ; to ensure export earnings, and to increase the income of rural and agricultural workers who constitute the majority of the population and are therefore the largest potential buyers of industrial products. Agriculture needs the drive and enterprise which characterise industry. Agricultural development is vital, but there is no conflict between agriculture and industry ; there need be no slackening of the process of industrialisation. Industry is second, but a very close second, to agriculture in priority. Whatever the shifts in emphasis from time to time, industrialisation must always remain as the main ultimate objective.

3. The progress of industrialisation in recent years has been spectacular. The rate of progress recorded compare favourably with the highest achieved in the history of industrialisation in any country. The economy which was exclusively agricultural at partition is rapidly acquiring a semi-industrial character. The country then was a producer of food and raw materials and an importer of manufactured goods, but is now producing more and more of the manufactured goods needed for consumption and for increasing export earnings. Yet this is no more than a beginning of the process of industrialisation. A country which has a leeway of centuries, to make up cannot think of rest periods. We conceive of our industrial programme in the Plan period as one first, of consolidation which will include improvement, modernisation and balancing of existing plants, and second, of a further advance on a broad front. The main objects of the programme are (a) improvement of the people's welfare, (b) improvement of the foreign exchange position, and (c) supplying the materials needed by the country for implementing the Plan. Consolidation and development must proceed simultaneously ; the very idea of a breathing time to look back, take stock, settle down comfortably, and then to think of the next stage is inconsistent with the speed and tempo of the atomic age, and wholly repugnant to the philosophy of dynamic life which has given birth to Pakistan.

4. The scientific and industrial revolution which has transformed the techniques and levels of production in advanced countries presents large opportunities for promoting the welfare of the people. The country can draw upon the results of scientific and technological advances made by other countries. These opportunities must be seized as rapidly as available knowledge and resources permit. Industrial development is based upon the application of scientific technology. The country must select and apply the scientific discoveries of the past and also keep abreast of current progress. The technology needed is that which will permit easier, cheaper and more abundant production. To obtain such technical knowledge and adapt it for use requires a special kind of research which the country has yet to establish and promote.

5. Industrialisation means a social as well as an economic revolution. The migration of workers from agriculture to industry brings new urban concentrations and gives rise to large scale problems of housing, sanitation, family disruption, and unaccustomed ways of life. The use of factory production inevitably leads to revolutionary changes in the ways in which people live, work, and think. It has caused social misery, squalor, and distress in other countries in the early stages of industrial development. It produces profound changes in social attitudes and relationships, and generates the need of new institutions. Enormous problems of human

adjustment and of social and economic policy fill the path of industrialisation with hazards of all kinds through which the country must chart its course wisely, fully using the experience of others. To accomplish successfully the rapid change which is taking place and will continue to take place for many years to come will call for great forethought, careful planning, and delicate handling by government officials and private citizens, in a spirit of devotion to the country's future.

6. We mention briefly here some of the main problems with which the country has to contend in promoting industrial development. The most prominent among them is that of limited availabilities of foreign exchange. This is frequently a feature of an under-developed country engaged on a dynamic programme of economic development. A backward economy subsisting on an undeveloped base of agriculture and small-scale industries usually has no problems of foreign exchange. Its requirements of consumer goods are small and simple, and can be satisfied from the exchange earned by exports of food and raw materials. This easy position is liable to change to one of acute scarcity of foreign exchange when the country begins to import capital goods for industrialisation, and the people begin to acquire new tastes and develop new requirements, such as those for education, health, and better houses. Pakistan has entered this critical stage. The solution lies in a diversified and ambitious but balanced and realistic programme of industrial development, combined with larger agricultural production. The foreign exchange problem will be solved by increasing production for export, for replacement of imports, and for meeting new requirements of the economy from internal sources. A slackening of industrial development which must inevitably be accomplished by a slow rate of general development is no solution, because it would seriously accentuate social and economic problems. Attempts to maintain a high level of development in other than industrial fields will intensify, not relieve, the foreign exchange situation.

7. As the industrial development of the country proceeds, more and more machinery and equipment will be purchased and installed. This creates the important problem of maintaining the plant in a good condition. In a country using modern machinery on a large scale for the first time, maintenance is likely to be inadequate, partly because of insufficient care on the part of operating agencies, and partly because of the lack of facilities. Usually there is insufficient awareness of the risks from inadequate care, and of the benefits from adequate maintenance. The situation has been aggravated by the short supplies of spare parts resulting from scarcity of foreign exchange. A little preventive care can keep plant and machinery functioning properly and prolong its life.

8. Industrial development requires increasing amounts of fuel and raw materials. There will be substantial increases in domestic supplies but not enough to dispense with imports. A careful and wise management of foreign exchange resources is essential so that enough fuel and raw materials are imported to operate existing industrial units at economic levels, and that new plant can be established to improve the country's ability to obtain the needed supplies.

9. Industrial development requires large numbers of persons with various kinds and degrees of technical skill : production workers, machinists, foremen, engineers and engineering technicians, accountants, salesmen, managers and so on. The country is just beginning to have some people trained in these skills and very extensive training programmes are necessary to increase their supply. It seems inevitable during the Plan period that the supply of trained personnel will lag behind requirements and exercise a constricting influence on the development programme. The most critical shortage will be in the supply of trained managers.

10. Large-scale organised industry is generally conceived in terms of light industry and heavy industry ; the industrial development programme must be so framed as to maintain a balance between them. Broadly speaking, light industry turns out consumer goods, such as cloth, matches, cigarettes, radios, and shoes ; heavy industry produces goods needed by other industries or for construction, such as cement, heavy chemicals, iron and steel, and railway carriages. The distinction is not sharp in all cases, for many goods are needed by other industries as well as for consumption. Similarly what are known as intermediate goods might be the concern of light or heavy industry according to their nature or practical convenience. The distinction is, however, of basic significance in programmes of economic development. It is one of the purposes of planning to strike a balance between the claims of light and heavy industry according to the needs of the economy from time to time.

Emphasis on one or the other in one period would influence the distribution of resources in future periods between consumption and investment. A strong emphasis on heavy industry is some-times advocated to facilitate larger investment programmes and more rapid development in the future, or for developing defence potential. As against this, emphasis on light industry can be justified for bringing a rapid increase in consumption levels in the immediate future. This distinction, and the need for striking a balance, is of special significance in long-range planning. It is necessary to maintain a long-term perspective while preparing plans for five-years or similar relatively short periods.

11. We have drawn attention to some of the major problems of industrial development. The programme we have framed attempts to meet these problems. We cannot claim to have made more than a first attempt, however, and constant thinking and planning will be necessary to ensure that industrial development will promote the welfare of the people. In piloting the country through the stage of transition to industrialism the Government have to play the major role, guiding, assisting, encouraging and leading the people. But the role of private entrepreneurs is equally important. Planned industrial development directed towards defined social goals instead of immediate profits involves a challenge to them. Their answer, expressed in deeds and attitudes, will determine their future in this country. It is in the sphere of industrial development that private enterprise must establish its claim to a permanent place in the social and economic fabric of the country. It will be judged finally and decisively in terms of the service it renders to the people.

Industrial development since Independence

12. Reliable statistical information on the development of industry in recent years is far from complete. Some data are available from the census of manufactures, which is based upon an annual report from the owners of factories employing 20 or more persons and using power. The census of manufactures has been completed for only one recent year, 1953, and very many firms which should have reported did not do so. The Department of Supply and Development has gathered considerable information about basic industries. A number of items of information are available also about the production of certain goods—cloth, cigarettes and cement, for example—which are reasonably reliable and correct, and a large volume of miscellaneous figures for different individual industries, many of which are estimates of varying reliability. These data leave a great deal to be desired. The most important lack is that there is very little reliable information about any aspect of small-scale and cottage industry. The figures that are available have been used to the maximum extent possible. For some of the smaller industries for which data were not available we made our own estimates. The limitations of the underlying data must always be kept in mind.

13. In the economy of undivided India the area that is now Pakistan produced a large share of the agricultural, forest and animal products on which the sub-continent's major industries were based. It was primarily a supplier of food and raw materials. Thus, jute was shipped to Calcutta for processing and cotton was sent to Bombay and other cities for spinning and weaving. They were the centres of industrial and commercial development. On partition Pakistan was cut off from the industrial facilities to process its raw materials. A very large part of the rapid industrial development in recent years has taken the form of establishing facilities to process these raw materials. Although there has been rapid and firm progress in almost the entire realm of industrial development, it is the industries based on raw materials produced in the country which have flourished most—such as cotton and jute textiles, leather, sugar, cement and paper.

14. In the first year of the country's industrial development, private investors, presented with a variety of promising opportunities, selected those which assured the highest profits with the least organisational effort and minimum investment. Although this was wise investment policy from the standpoint of the individuals concerned, it did not lead to balanced industrial development from the standpoint of the country. Several industries in which the country has considerable natural advantage remained largely un-developed for lack of private enterprise. For the purpose of promoting these industries of national importance for which private enterprise was not forth-coming, the Pakistan Industrial Development Corporation was established in January, 1952. By

the beginning of the Plan period the P. I. D. C. had undertaken some 30 schemes involving a total expenditure of about Rs. 560 million, of which the Government's share was about Rs. 380 million, and the private share Rs. 180 million. The P. I. D. C's. major investments have been in paper and paper board, cement, fertilisers, jute mills, shipyards, and the Sui-Karachi gas pipeline. These six industries account for 85 per cent of the total capital outlay in the projects under execution at the beginning of the Plan period.

15. Table 1 presents information about the increase of production of selected major sectors of large scale industry* for which data are available for the years 1948 to 1954, inclusive. Production for the years 1948 and 1954 is evaluated at 1954 prices. In calculating the value columns, *ex-mill* prices were used as best they could be determined from various sources. The value of industrial production in these selected sectors shows a remarkable increase, from Rs. 1302 million in 1948 to Rs. 2813 million in 1954. Quite naturally those industries for which the conditions were most favourable expanded most rapidly. Thus, the production of cotton cloth and yarn increased from Rs. 98 million in 1948 to Rs. 539 million in 1954, and the production of jute goods from nothing at all to Rs. 65 million in the same period.

*Throughout this Chapter the term "Large scale industry" is used in the sense of the definition of section 2 (j) of the Factories Act of 1934 to mean any factory employing 20 or more workers and using power.

†These columns were not taken from the Explanatory Memorandum on the Budget, 1956-57, as were most of the other data.

TABLE 1

Summary of production of selected large-scale industries, 1948-54(1)

Sector	Unit	Quantity of Production										Value of P roduc- tion at 1954 ex-mill prices		Per cent change in value of production 1948-1954	
		1948	1949	1950	1951	1952	1953	1954	1948	1954	(Million rupees)				
1	2	3	4	5	6	7	8	9	10	11	12				
<i>Agricultural Processing :</i>															
Cotton ginning	... Thousand tons (2) ginned cotton	160	195	233	247	281	283	265	360.0	610.0	+69				
Jute baling	... Millions of pucca bales (3)	1.1	1.7	2.5	3.0	3.7	1.8	2.2	121.0	264.0	+103				
Tea manufacturing	... M. lbs. (4)	43.5	47.1	53.2	53.4	53.1	55.7	55.8	87.0	111.6	+28				
<i>Milling :</i>															
Wheat (5)	... Thousand tons milled wheat	390	392	361	346	270	306	340	123.3	107.8	-13				
Rice (6)	... Thousand tons milled rice	1680	1657	1635	1594	1590	1729	1850	317.8	350.0	+10				
<i>Food Products Industries :</i>															
Edible vegetable Oils (7)	... Thousand tons	60	60	75	80	92	100	120	111.5	223.0	+100				
Vegetable ghee	... Thousand tons	0.1	3	4	6	8	11	11	0.3	36.3	+12,000				
Fruit & vegetable processing(7)	... M. lbs.	1.8	1.8	1.9	1.9	2.0	3.5	5.0	1.3	3.8	+192				

(1) Source : " Explanatory Memorandum on the Budget of Govt. of Pakistan for 1956-57 ", except where otherwise indicated.
 (2) Long tons of 2240 lbs.
 (3) Source : Directorate of Jute Prices, East Pakistan.
 (4) M : Million.
 (5) 10% of total crop as given in " Explanatory Memorandum on the Budget, 1956-57 ".
 (6) 20% of total crop as given in " Explanatory Memorandum on the Budget, 1956-57 ".
 (7) Planning Board Estimates.

TABLE 1—*contd.*

Sector	Unit	Quantity of Production											Value of production at 1954 ex-mill prices		Per cent change in value of production 1948—1954
		1948	1949	1950	1951	1952	1953	1954	1948	1954	(Million rupees)				
1	2	3	4	5	6	7	8	9	10	11	12				
<i>Agricultural Processing :</i>														(1)	
Sugar	... Thousand tons	30	39	33	43	64	86	76	N.A.	81.9	N.A.				
Cigarettes	... Millions	Nil	241	1488	2716	3170	3996	4588	Nil	67.8	All new capacity				
<i>Textiles :</i>															
Cotton cloth	... M. yds. (2)	88.06	92.44	106.29	127.16	174.16	251.55	345.25	86.7	347.8	+300				
Surplus cotton yarn	... M. lbs.	6.20	9.26	13.39	19.37	19.98	52.54	99.94	11.7	190.8	+1630				
Woollen and worsted yarn	... M. lbs.	Nil	Nil	Nil	1.14	1.54	8.7	7.5	Nil	34.0	All new capacity				
Silk (art fabric)	... M. yds.	N.A.	N.A.	N.A.	1.0	3.7	10.2	12.6	N.A.	37.8	N.A.				
Jute goods	... Thousand tons	Nil	Nil	Nil	1.4	17.57	50.12	53.14	Nil	64.7	All new capacity				
Paper	... Thousand tons	Nil	Nil	Nil	Nil	Nil	Nil	20.0	Nil	23.3	All new capacity				
<i>Leather :</i>															
Upper	... M. sq. ft.	1.0	1.1	1.5	2.25	7.2	7.2	8.6	1.8	15.6	+766				
Sole	... M. lbs.	1.5	1.8	2.5	3.1	8.3	8.3	9.6	1.5	9.8	+553				
Cycle tyres and tubes	... Thousand	Nil	13	112	621	776	1367	1902	Nil	7.7	All new capacity				

Chemicals :

Sulphuric acid (3) ...	Thousand tons	0.33	0.33	0.4	0.7	0.7	1.0	1.4	0.1	0.6	+500
Soda ash (3) ...	Thousand tons	20	20	20	23	23.5	24	25	7.4	9.3	+26
Caustic soda (4) ...	Thousand tons	Nil	Nil	Nil	Nil	Nil	Nil	1.5	Nil	0.78	All new capacity
Pharmaceuticals ...	Thousand gins	N.A.	N.A.	100	100	125	150	158	N.A.	2.1	N.A.
Paints & varnishes (3) ...	Thousand tons	Nil	Nil	1.0	1.7	2.0	3.5	8.0	Nil	17.4	All new capacity
Matches (6) ...	Thousand gross boxes	650	992	1054	936	546	4969	9528(6)	2.2	33.2	+1550
Soaps (5) ...	Thousand tons	Nil	Nil	Nil	3.2	10.0	12.0	15.0	Nil	25.2	All new capacity
Rosin & turpentine (4) ...	Thousand tons	1.8	2.0	2.0	2.0	2.2	2.3	2.3	0.7	1.0	+43
Petroleum refining : ...	M. gins.	10.6	23.9	39.9	41.3	48.5	56.6	61.1	6.2	36.0	+500

Non-metallic mineral products :

Glass (3) ...	Thousand tons	Nil	Nil	6.0	7.0	7.2	9.0	10.5	Nil	5.2	All new capacity
Cement ...	Thousand tons	324	422	414	499	530	596	673	25.9	54.0	+108

Engineering Industries :

Steel melting ...	Thousand tons	2.0	4.0	3.0	3.0	7.0	10.0	10.0	0.7	3.6	+414
Steel rerolling ...	Thousand tons	3.0	12.0	23.0	24.0	27.0	25.0	69.0	1.2	21.8	+1716

Electrical Industries :

Electric fans (4) ...	Thousands	N.A.	N.A.	N.A.	10.0	20.0	20.0	26.0	N.A.	2.9	N.A.
Other equipment (4) (including radios)	Rs. Million	N.A.	N.A.	1.9	2.2	5.0	6.2	7.1	N.A.	7.1	N.A.

(1) N.A.—Not available.

(2) M.— Millions.

(3) Source : Report of the Economic Appraisal Committee, February, 1953.

(4) Planning Board Estimates.

(5) Source : Explanatory Memorandum on the Budget, 1955-56.

(6) 40—60 sticks converted to 20—30 sticks.

16. There are no estimates of changes in small-scale and cottage industries. It is likely that while growth has been taking place in small industries, it has not been so rapid as in large-scale industry. Although as yet no comprehensive index of industrial production is available, a partial index based on the production of 17 industries, mostly consumer-goods industries, and using 1950 as the base year equal to 100, shows an increase to 350 in 1955.

17. It is clear that at independence there was little industrial development in Pakistan aside from the traditional cottage and handicraft industries. Since then, development has been very rapid—almost spectacular; the output from large-scale plants has much more than doubled. The share of industry in the entire national income has been rising, but still represents only a small part of the total. Its rate of growth has, however, probably been higher than that of any other sector.

18. Since independence, investment in consumer-goods industries has proceeded at a faster pace than in producer-goods industries. Excluding railways, power stations and ordnance shops, which are not included under "industry" for purpose of this chapter, about 60 per cent of present industrial investment is in consumer-goods industries as against 40 per cent in producer-goods industries. It is natural that in the early stages of industrial development light industry, being less capital-intensive and involving simpler technology, should expand more rapidly than heavy industry. This was also necessary to gain self-sufficiency in consumer-goods in order to release foreign exchange resources for the purchase of capital goods. It has also introduced a measure of stability in the economy of the country.

19. The foregoing paragraphs summarise the available information about the growth of industry since independence. It is possible to give a somewhat fuller account of the situation just prior to the Plan period. Table 2 presents information on large-scale industrial production in 1954, and covers a somewhat wider range of industries than Table 1. The striking feature of this table is the heavy concentration of production in three categories: agricultural processing industries, food products industries (including tobacco), and textiles. Together these three groups accounted for production of a value of about 2570 million rupees out of a total large-scale industrial production of about 3410 million rupees, or about 75 per cent of the whole. This is an indication of the dependence of the country's industry on agricultural raw materials. Very rough estimates of production in 1954 in various sectors of small-scale industry show approximately the same degree of dependence on such materials.

20. To a large extent the industrial development of recent years has been guided not by a carefully worked out long range strategy, but by a series of *ad hoc* decisions based on what seemed most necessary and expedient at the time. This does not mean that the development that has taken place was wrong. We have been impressed by the fact that the great majority of plants that were established were soundly conceived, and the resulting industrial structure is effective and solidly based. Nevertheless the situation has changed. Many of the easy and obvious opportunities for investment which offered prospects of large immediate profits have been exploited. There remain many industries in which Pakistan has natural advantages still waiting to be systematically developed. In established lines as more industrial capacity is installed, the days of automatic profits will pass, and competition will begin to force the attention of businessmen towards increasing efficiency and lowering prices. Future investment must be more carefully planned to bring maximum results. In general the Plan period must be a period of consolidation, fuller use of existing capacity, and better balanced development. The country's industrial base must be consolidated, but this is not inconsistent with a well planned expansion of industrial development. Industrialisation must maintain its tempo though on a more carefully planned and balanced basis. This along with improvements in agricultural production holds out the main hope of improving the foreign exchange position of the country in a reasonable period of time to a point, where in addition to meeting maintenance requirements, the country would be able to finance from its own resources a sizeable programme of development from year to year. Industries permit better standards of living and generate larger profits which can be utilised for expanding investment programmes. Industrialisation is also needed to provide employment for the increasing labour force in urban areas.

TABLE 2

Large-scale industrial production, 1954

Sector	Production, 1954		
	Quantity	Value (Million rupees)	Per cent of total production
(1)	(2)	(3)	(4)
<i>Agricultural processing :</i>			
	(1)		
Cotton ginning	1.5 M. bales.	610·0	
Jute baling	2.6 M. pucca bales.	264·0	
Tea manufacturing	55.8 M. lbs.	111·6	
<i>Milling :</i>			
Wheat	0.34 M. tons.	107·8	
Rice	1.85 M. tons.	350·0	
Sub-total		1443·4	42·0
<i>Food products industries :</i>			
Edible vegetable oils	120,000 tons.	223·0	
Vegetable ghee	11,000 tons.	36·3	
Food processing	5.0 M. lbs.	3·8	
Sugar	76,000 tons.	81·9	
Cigarettes	4588 millions.	67·8	
Sub-total		412·8	13·0
<i>Textile and clothing :</i>			
Cotton	Surplus yarn 100 M. lbs. 345 M. yds. cloth	190·8 347·8	
Woollen	7.5 M. lbs. yarn.	34·0	
Jute	53,140 tons.	64·7	
Silk and rayon... ..	12·6 M. yds.	37·8	
Hosiery and knitted goods	N.A. (2)	9·0	
Apparel	N.A.	1·5	
Sub-total		685·6	20·0

(1) M=Million.

(2) N.A.=Not available.

TABLE 2—contd.

Sector	Production, 1954		
	Quantity	Value (Million rupees)	Per cent of total production
(1)	20	(3)	(4)
<i>Wood products and paper :</i>			
Saw milling	1.8 M. cu. ft.	10.4	
Wood-ware (mostly furniture)	N.A.	2.2	
Plywood and tea chests	200,000 sq. ft.	0.1	
Printing, writing and wrapping paper	20,000 tons.	23.3	
Sub-total		36.0	1.1
<i>Leather and products :</i>			
Leather tanning	8.6 M. sq. ft.	25.4	
Leather shoes	9.6 M. lbs.		
	10.4 M. pairs.	104.0	
Sub-total		129.4	4.0
<i>Rubber products :</i>			
Cycle tyres	1.9 M. units (Tyres and tubes com- bined)	7.7	
Cycle tubes			
Rubber soled canvas shoes	5.0 M. pairs	15.0	
Other rubber products	1,000 tons	8.3	
Sub-total		31.0	0.9
<i>Chemicals Industries :</i>			
<i>Heavy chemicals :</i>			
Sulphuric acid	1,400 tons.	0.6	
Soda ash	25,000 tons.	9.3	
Caustic soda	1,500 tons.	0.78	
Pharmaceuticals and fine chemicals	N.A.	5.6	
Paints and varnishes	8,000 tons.	17.4	
Matches	9.5 M gross boxes (1) (20-30 sticks)	33.2	
Soap	15,000 tons.	25.2	
Turpentine and rosin	N.A.	0.6	
Sub-total		92.68	3.0

(1) 40—60 sticks converted to 20—30 sticks.

TABLE 2—contd.

Sector	Production, 1954		
	Quantity	Value Million Rupees)	Per cent of total production
(1)	(2)	(3)	(4)
<i>Liquid fuels :</i>			
Petroleum refining	61.1 M. gallons	36.0	1.0
<i>Non-metallic mineral products :</i>			
Structural clay products	7,000 tons.	1.3	
<i>Glass :</i>			
Hollow-ware	10,500 tons.	5.2	
Cement	650,000 tons.	54.0	
Cement products	N.A.	3.2	
Ceramics and refractories	500 tons Ceramics	0.6	
	6,000 tons Refractories		
Sub-total		64.3	2.0
<i>Engineering Industries :</i>			
Steel-melting	10,000 tons.	3.6	
Steel re-rolling	69,000 tons.	21.8	
Shipyards	N.A.	10.2	
Medium and light engineering (1)	N.A.	70.0	
Non-ferrous products	N.A.	29.0	
Enamelware	N.A.	0.8	
Sub-total		135.4	4.0
<i>Electrical Industries :</i>			
Motors, switch gear and fans	N.A.	7.0	
Cables, batteries and appliances	N.A.	0.5	
Radios and rediffusion	15,000 Radios.	3.0	
Sub-total		10.5	0.3
<i>Other Industries :</i>			
Printing and publishing	N.A.	25.0	
Film industry	15 Films.	6.0	
Miscellaneous industries not listed (2)	N.A.	270.0	
Sub-total		301.0	8.8
Total industries		3378.08	100

(1) Includes iron foundries, but not steel melting, casting or re-rolling.

(2) Includes such industries as bakery goods, dairy products, beverages, breweries, plastic products, sports goods, grinding wheels, surgical instruments, musical instruments, pencils, paper products, bone crushing, oxygen and acetylene, and cosmetics, except where no power is employed, in which case they are included under small-scale industry.

Objectives of industrial development

21. The first purpose of industrial development is to produce, with the resources that can be devoted to it, the largest amount of those products which are wanted most in the country. The objective is to pursue those development opportunities which are most efficient in the sense that they will yield the largest returns to the nation in relation to the investment that must be made in them. Thus an investment in new plant or in improving existing plant which would cost 10 million rupees and would thereafter add 5 million rupees each year to the national product should clearly be preferred to an alternative investment which also would cost 10 million rupees, but would add only 1 million rupees to the national product. Maximum immediate returns are not the only consideration, however. The benefits of each scheme must be judged in its relation to the total programme and its long range prospects. Schemes in oil exploration, iron and steel, and afforestation are examples of investments needing to be planned in the long-term perspective.

22. The second objective of industrial development and in many ways the most important in the present circumstances of the country is to earn or save foreign exchange. The country's foreign exchange situation is very tight, and is likely to remain so for some years. Foreign exchange earnings will grow over the next few years ; but a substantial improvement can come also from increased domestic production of goods now imported. As plants are installed which enable domestic production to be substituted for imports, foreign exchange will be freed which can be used to import more machinery and raw materials for further plants. If the successive investments are large enough, the country can overcome the extreme stringency of foreign exchange which characterises the economy now. The purpose must be to invest in those industries which save the largest amount of foreign exchange in relation to the cost of the investment. An investment which saves an amount of foreign exchange annually equal to 50 per cent of the investment should clearly be given priority over an investment which only saves in foreign exchange 10 per cent of its cost each year. Resources are scarce, and must be employed in those activities where the returns will be highest.

23. The third objective of industrial development is to put people to work ; to employ the labour force usefully and for the benefit of the community. The fundamental characteristic of industrial production is that through organisation and the use of tools and equipment workers are enabled to produce things which they could not produce at all, or could produce only very slowly and at much greater cost, if they worked alone. To employ people in well-conceived industrial enterprises—whether small or large—means to obtain more output per worker, and thus to increase the national product for distribution among the people. In addition, under present circumstances there is a great deal of un-employment and under-employment in the country, and it is a major objective of national economic and social policy to create additional opportunities for productive employment for those who want work. Here again the available resources must be used wisely in order to obtain the maximum amount of employment from the resources invested. And it is vitally important to consider the indirect employment as well as the direct employment which will result from a given investment. For example, a power station will normally employ only a few people directly in its operation, but will provide electricity for the operation of many industrial plants employing perhaps many thousands of workers. Even where the results in terms of indirect employment cannot be seen so clearly, such results do follow from investments and are often substantial. Large profits from new investments will permit the development of social services and create new jobs.

24. There has been much discussion in recent years about the relative value in an under-developed country of investments intended to obtain the maximum increase in national income through using the most modern technical methods and those intended to employ the maximum number of persons through using less modern technological methods. This issue is often described in terms of a distinction between "capital intensive" and "labour-intensive" investments, the latter often being regarded as preferable. In an under-developed economy suffering from scarcity of capital the question of technology is very important; but capital-intensive investments cannot be rejected without duly analysing and weighing all the relevant factors. Full account must be taken of the indirect employment generated by such investments as well as of the profits created by them which

permit expansions of employment and facilitate larger investment programmes. In a number of cases highly capital-intensive industries are thoroughly desirable even under present circumstances in the country. For example, power stations will yield high returns in terms of additional national output and at the same time create large opportunities for additional employment. The jute industry also must employ the latest equipment in order to establish itself in the competitive world market.

25. Many of the assumed conflicts between capital-intensive and labour-intensive processes are stated in terms of extremes, neither of which offers the best solution. It would be possible, for example, to build large construction projects at the one extreme almost entirely by hand labour and at the other extreme almost entirely by machinery. It is frequently claimed that the one is preferable from the standpoint of employment and the other from the standpoint of national income. Both assertions are only partially true. To operate such a project exclusively with hand labour would usually be so costly that other projects would have to be deferred and their employment opportunities lost. To operate it exclusively with machinery would likewise require such a heavy investment that other projects would have to be postponed and their potential contribution to the national income lost. The true solution to such problems will probably be found at some point between the two extremes, based upon the relative cost and efficiency of doing the job with different combinations of labour and capital equipment. In this country it will ordinarily be profitable to use a higher proportion of labour than is customary in advanced countries, because labour is more abundant and cheaper. But it would be easy to go too far and put misdirected emphasis upon creating any kind of jobs, or upon preserving stagnant and out-dated techniques in order to avoid apparent disturbances in employment opportunities. Such actions would slow down the rate of increase in national income and cut down the total opportunities for additional employment. The history of economic development shows that improved techniques, while causing immediate disturbance to employment, have contributed to expanded production, consumption and employment. Progress indeed would be inconceivable without them.

26. Unfortunately there has been little scientific study of the relative costs and benefits of adopting different techniques in specific cases. The necessary engineering and economic research has not been conducted anywhere in the world, so far as we are aware, which would permit an informed decision to be made about the best technology to use in each industry, given the relative scarcity of capital and abundance of labour in this country. In these circumstances we have made the best judgments we could in the specific cases that faced us. Our recommendations give strong emphasis to small-scale and cottage industries, where employment per unit of capital is often high, in those cases where production is relatively efficient or can be made so. It is necessary, however, to guard against the danger of perpetuating out-dated and inefficient techniques at the cost of society. Protective measures once extended, are difficult to withdraw and tend to become permanent.

Industrial management training and research

27. Industrial management as a profession is not widely understood in the country, and many persons who are in fact carrying the responsibility of managers are not trained for the work. There is little recognition of the management profession as such. A very large percentage of industry is family-owned and operated and outsiders are not hired above the rank of foreman. This is true even among some of the largest concerns. As a consequence, the wide variety of skills and experience required to operate a large enterprise successfully is frequently lacking, and factories in many cases do not achieve the efficiency for which they were designed. Similarly, the managers of most small-scale enterprises have had little or no training and frequently do not have even a rudimentary knowledge of business accounting to help them in making decisions. In remedying this situation three lines of action are suggested: (a) training young people in the management profession at the university level, (b) providing in-plant training for the present management, and (c) improving supervisory personnel through special training programmes.

28. We are assuming there is a desire to improve the management and increase the productivity of industry. For the most part this assumption seems warranted. The incentive to improve the productivity of a plant is ordinarily provided by the spur of competition from other producers, which impels each producer to seek to increase his plant's productivity and to lower costs and prices in the interest of larger sales. It is possible of

course for producers to try to join together in cartels for the purpose of avoiding competition. If industry is to be dynamic rather than static, it must be the continuing policy of the Government to prevent such cartel operations. In a few fields of industry there will be only one or two producers until the country's consumption expands further, and in some fields such as certain railway and telephone equipment the Government is the only producer. In these cases the spur of competition is absent, and special measures are necessary to require managers to strive for higher efficiency and productivity. In cases where there are only one or two private producers, one of the most effective means for requiring efficiency is the potential competition of lower-priced imports, and it must be a steady purpose of the Governments' import control and tariff policies to avoid shielding inefficient local producers from the effects of foreign competition. In cases where the Government is a monopoly producer, the standard of increasing efficiency must be applied to management as a matter of public policy.

Management training

29. Assuming that managers have the desire to improve the efficiency of their plants, they must know how to proceed, and to this end several measures are needed. First of all, training for business management must be recognised and established as a professional course of study in the universities. One such course of training has been established so far, in the Institute of Business and Public Administration of the University of Karachi, and other similar professional courses are proposed at other Universities, (as noted in the Chapter on Education and Training). During the Plan period the numbers of graduates from these courses will necessarily be small, but they will nevertheless be significant ; in the long run a very great influence can be exerted by these professional courses to prepare young men for junior executive positions in business and industry.

30. A second important way of bringing knowledge about better management and organisation to managers is through advisory and training services brought to the plant. In more advanced countries consultations on management and training are available from many experienced private firms. No such firms yet exist in Pakistan, though they will undoubtedly be established in the future. It is necessary for Government programmes to fill this gap and a beginning has been made in this direction.

31. In 1955 a productivity mission from the International Labour Office began to function with special reference to the textile industry. The advisers in the mission have conducted a number of management training courses in textile mills in Karachi, Lyallpur and other centres, and have also given advice to a number of firms on management and organisation. The results have been impressive : In one weaving shed, for example, output was raised 40 per cent within a few months, and further increases are expected. During the Plan period it is proposed to establish at least one productivity centre, to put this work on a permanent footing. Such productivity centres have been set up in almost all countries in Western Europe, in Egypt and in India, and have proved to be of considerable value. Among the activities of this productivity centre, the most important would be the organisation and conducting of specialised courses in industrial management for executives and supervisors from private industry and government undertakings. In addition, the staff of the centre would act as advisers in management and organisation to industrial concerns. At a later date, when sufficient trained staff members are available, the centre will begin to conduct research in management techniques. The productivity centre could most appropriately be organised within the Ministry of Industries, although it must of course have close liaison with the Ministry of Labour since the purpose of raising productivity is to benefit workers and consumers as well as the owners of industry. It is proposed to establish this first productivity centre in Karachi, from which teams of consultants would travel to East and West Pakistan. Branch centres should be established, the first one in Dacca, as soon as enough trained persons are available.

32. A second scheme for improving management now in operation is the training-within-industry programme of the Institute of Personnel Training attached to the PIDC. The work of this Institute is primarily directed toward improving the management skills of supervisors from the charge-hand level to junior managers. The Institute has had expert advice and has succeeded since its establishment in 1954 in building a staff sufficiently

well trained to conduct the training courses in private firms and government undertakings. Operations have been carried on in both Wings, and regional offices have been established in Dacca and Lahore. The Institute's work has been useful and should be continued, either independently or in association with the Productivity Centre.

3. It is very important to assist small-scale and cottage industries with their problems of management and organisation, but especially difficult to do so because of the large numbers of units, their dispersion, and the difficulty of communicating with them. The Plan provides for meeting this need through demonstration and training centres, small-scale industry specialists attached to the Village AID organisation, and other means which are discussed in Chapter 22.

Improving the technical skills of the work force

34. It is frequently possible to increase production from existing equipment by raising the level of technical and operative skill of the working force. The general subject of training technicians and industrial workers is discussed in the chapters on Education and on Labour and Employment. It is sufficient to say here that the Plan provides for a rapid increase in the education of persons with skills useful for industrial work, though the total number turned out during the Plan period cannot be large. Young men coming out of school should not be regarded as finished technicians or workmen but rather as persons qualified to receive intensive industrial training. It is not the function of the educational system to turn out skilled workmen. That is the function of industries themselves, and systems of apprenticeship, on-the-job training, and in-service training must be installed widely in industrial establishments for this purpose.

35. Training programmes in industrial establishments should not be limited to new employees. A good industrial training system will be capable of lifting the level of skill of virtually every employee in a plant, old or new, over a period of time. It is essential therefore to think of industrial training as a permanent activity of any industrial firm, which will make possible steadily more production with the same equipment.

36. There is no basic reason why continuous and effective training programmes should not be conducted in small as well as large industrial establishments, but there are special difficulties. Few managers of small business understand the importance and methods of good training, and they cannot afford the special staff and facilities which large firms can devote to training. For this reason it is proposed that one of the major purposes of the small industries demonstration-cum-training centres will be to conduct specialised training courses for persons employed in small-scale industries, and to advise the owners and managers of such businesses how to carry on effective training programmes in their own establishments.

Industrial research

37. Next to training programmes for management and workers, the most important service need of industry is for adequate research. Two main kinds of research are needed: market or consumption research, and research in manufacturing processes and materials. Very little research of either type is taking place at present, though a beginning has been made in research on processes and materials by the laboratories of the Council of Scientific and Industrial Research, and one or two other institutions.

38. Market, or consumption, research is required to find out what industrial products are needed and wanted in the country, how those needs and wants have been met in the past, and how they could best be met in the future. Very little accurate information is available on such matters. It is obvious that a country of 80 million people with a rising population and a rising national income will provide a large and expanding market for industrial products. But this general conclusion does not go far toward answering such specific questions as: how many yards of cloth per person will be wanted in the country each year; how fast will the demand for processed sugar rise in relation to the rise in national income; and how many pumps of different kinds will be required each year to provide pure water in the country's villages. Questions of this type should be answered by detailed consumption surveys, using general statistical information about population, income, prices, and so forth, supplemented by field investigations, sample surveys, and other systematic and detailed enquiries. At present

the general statistical information is very limited and virtually no detailed surveys have been made. In preparing the Plan we have frequently had to rely on nothing firmer than an estimate of past domestic production plus imports as an indication of the size of the market for different products. This situation must be improved as rapidly as possible and we recommend that the Ministry of Industries, through the Industrial Planning and Development Organisation proposed below, should take the leadership in starting systematic market research, using the agency of the National Sample Survey. For export products like jute, surveys should be made also of trends in external markets, and research directed towards the possibility of expanding sales through the development of new uses.

39. Research on industrial materials and processes is urgently needed. Business firms and the Government are both hampered at present by its lack. A large number of questions demand immediate answers. To what extent can domestic substitutes economically replace imported raw materials? To what extent can locally available paper and glass be substituted for imported metal in packaging? Are there by-products of existing industrial processes, now going to waste, which could economically be used in producing other goods? What chemical industries should be established using the country's large reserves of natural gas as a raw material? What is the most economical source for sulphur, coal, gypsum, or some other source? How can the processes used by small-scale industries, to produce bricks, ceramics and many other products be made more efficient? Are there possible new uses for indigenous raw materials, such as jute. These are merely examples; the list could be greatly extended. Some of the questions are relatively simple to answer; others are very complicated and would acquire considerable field investigation, laboratory testing and economic analysis before reliable judgments could be reached.

40. Laboratories are necessary to conduct research on many questions concerning industrial processes and materials, and the Plan provides for the further development of the laboratories of the Council of Scientific and Industrial Research, the Institutes of Glass and Ceramics, Cotton Technology and others. The country's greatest lack at the moment, however, is in the guidance and direction of the work of these laboratories and other means for industrial research. Accordingly, our major recommendation in this field is for the establishment of a department of Industrial Planning and Development in the Ministry of Industries. This organisation would not supplant any present organisation, such as the Council of Scientific and Industrial Research. It would plan and arrange for research and the Council will continue to be one of the main organs for carrying it out. Such an organisation would be in a position to survey the entire field of industrial research; to give direction and guidance to the Government's industrial laboratories and other research facilities; to arrange for research to be conducted by universities and private organisations; and to prepare programmes of industrial research giving due weight to priorities among the different requirements, and allocating the limited resources to their most valuable uses. Industrial research should not be considered, however, as solely the Government's responsibility. Associations of manufacturers and merchants, cooperative societies and individual industrial firms ought to make a beginning in conducting research in matters of their special concern.

41. The great bulk of the industrial research which should be done in the country at present is of the nature of applied rather than basic research. The libraries of research organisations in advanced countries are bulging with the results of investigations which need not be repeated here. For the most part the work should consist of obtaining the results of the latest and best investigations of research centres in other countries and adapting those results to local conditions. It will be extremely important to establish close working relationships with one or more first-class research institutes in the U.S., the U.K., or other countries, through which information can be obtained and repetition of work already done elsewhere avoided. The laboratories engaged on industrial research must be regarded as productive, functional parts of the country's industrial development facilities. Their results must be measured by their direct effect in improving efficiency and increasing industrial output, and while encouragement and opportunities should be extended to people who are inclined towards general research and are well fitted for it, the contribution these laboratories make to the general advance of science for the time being at least must be regarded as secondary. For example, it may be some time before the country has the

equipment and trained scientists to make original contributions to the advance of atomic energy research but it is most important in the meantime to obtain and apply for the country's benefit the results of atomic energy research done elsewhere.

Raising productivity of existing capacity

42. An industrial development programme does not mean only investment in new undertakings. Normally the largest immediate gains in production and employment are to be found by using existing plant and equipment more efficiently. It is necessary in many cases to add new capacity, but the first step in an industrial development programme must be to achieve the greatest production from industrial capacity already in existence. This applies, of course, to small-scale as well as to large-scale industry.

43. In general, it is possible to obtain considerably more production from the industrial facilities now existing in the country, and in the process to save foreign exchange and create additional employment. Sometimes this requires some new investment—additional equipment, for example, or modern machines. Frequently, however, greater efficiency and productivity can be obtained simply through better management and organisation of the work, better training of the work force, operating on double or triple shifts, or a better flow and handling of raw materials and spare parts. These opportunities are of the greatest importance, because they can yield more production without sizeable additions to capital equipment—and capital equipment is extremely scarce. Methods for spreading capital more thinly must therefore be vigorously applied.

44. One important means for obtaining maximum production from the capital equipment we already have is to operate that equipment as many hours in each day as possible. Adding a second shift of workers, or even a third shift, so that the plant operates 16 or 24 hours a day instead of eight, can result in doubling or tripling the output (and the employment) of the plant, with little or no addition to capital equipment. Many plants in the country—in the cotton textile industry for example—have been working regularly on a two or three shift basis, and the practice could be extended. Small businesses are often as capable as large of multiple shift operations. Perhaps the example of such operation that is nearest perfection is that of the rickshaw drivers, where three drivers take turns in operating the full 24 hours each day, thus achieving virtually 100 per cent use of their capital equipment, the rickshaw.

45. Where capital is so scarce as it is in this country, it would obviously be wasteful to establish two plants where one plant working a double shift could produce the same results. In general, government policy should be that before any new capacity is installed in an industry, it must be demonstrated that the additional output could not be obtained as economically by more intensive use of existing capacity.

46. At present the main obstacle to full use of existing capital equipment is the shortage of raw materials and spare parts, a good part of which must be imported. On no subject have businessmen addressed us with more vehemence. It is clear that the absence of sufficient imports, and also the intermittent, stop-and-go character of the flow of imported items, are very costly to the country, since they require plants to operate at low volume and therefore high unit cost, and also necessitate frequent and costly slowdowns or even interruptions of operations. This requires a system of priorities to derive maximum benefit from available foreign exchange resources. High priority has to be given to spare parts and raw materials, but new undertakings are also necessary to enable the country to replace imports by domestic production, and to increase export earnings. The Plan provides for foreign exchange to import raw materials and replacement parts in appreciably larger amounts than in recent years. This question is further discussed below.

New investment in industry

47. As we have emphasised before, the country should allocate the resources available to those industrial investments which will yield the maximum returns, whether measured in growth of national income, in earnings or savings of foreign exchange, or in additional employment. Ideally, in order to draw up the best possible programme for new investment, it would be necessary to have complete technical and economic analyses of a

great many alternative possibilities, which would show the various costs and returns from each. This would permit quantitative comparisons to be made among them and choice of the combination which would give the largest and most rapid gains.

48. Such information is only partially available in the country today. Useful project reports are available concerning many of the large P.I.D.C. projects. The information given by the 1953 census of manufactures shows costs and returns for the industries which were established at that time. We have gathered such other information as we could from government agencies and private businessmen. In many cases it has been possible to make reasonably accurate estimates concerning prospective returns on investment, as in rayon production for example, where the techniques involved are fairly well standardized and the elements of cost are well known. In all cases the effect of new or expanded capacity on national income and on the balance of payments has been taken into account. Because of the urgent need of improving foreign exchange resources we have given special importance to the foreign exchange aspects of industrial schemes. All this information has been used in drawing up the detailed programme of proposed new investment for modernisation, for expansion of existing facilities, and for new plants which is described later in this chapter. In addition, this programme has been discussed with representatives of the industries and government agencies concerned, and their comments and views have been taken into account. Nevertheless, any recommendations made at the present time for new industrial investment must be based in large part upon qualitative judgments rather than upon adequate technical data. A good deal of further study and investigation will be needed as the programme is put into effect, and changes will no doubt be necessary.

49. Several different types of new investment are included in the industrial development programme. The first is modernisation of plant and equipment. This includes the replacement of obsolete and worn-out equipment, bringing in new and cheaper sources of fuel and power, improving the physical layout of the plant to provide for a more efficient flow of work, improving the methods of handling materials, and other actions to raise productivity and lower costs. Conspicuous examples of modernisation needed in the country are found in cotton ginning, where most of the gins are so old and worn-out that much of the ginned cotton is below world standards of cleanliness and quality and sells at a discount in world markets; and in the handloom industry, where faster more efficient looms could double the daily production of the handloom weavers. Some modernisation, however, is needed in virtually every industry, though we recognise that the programme we have included in the Plan would not be easy to carry out, and might spread over more than one Plan period. It would present greater difficulties than the installation of new plants. Apart from the fact that a number of units which are in need of modernisation are evacuee property, and do not, therefore, belong to the beneficiaries, the programme must in nature be a diffused one. In addition, the owners may be able or willing to undertake the technical work or the investment involved. For other reasons also, investment in modernisation will be a necessary part of the industrial development programme in later years. New inventions and processes are flowing continuously from research institutions and practical production experience, and industrialists must acquire the habit of keeping their equipment and methods continuously up-to-date in the interest of large production and lower costs.

50. A second type of new investment in the programme is investment to balance existing facilities. Examples are numerous. Several textile mills need air-conditioning, combing, bleaching and dyeing equipment in order to make the best use of the spinning and weaving equipment which they already have. The country should also undertake the production of some of the equipment for the textile industry, all of which at present must be imported. There is need for small-job machine shops, and foundries to service larger plants, each of which now has to instal its own machine shop requiring a much larger total investment. More packaging materials should be manufactured within the country. All these investments will yield high returns and save considerable foreign exchange.

51. The third type of new investment is the establishment of new, independent plants. At the present stage of the country's development the most promising opportunities are those which depend primarily on raw materials that are available locally in good quality and at competitive prices. The element of local raw materials has clearly been of very great influence in our industrial development in recent years; the largest investments

have been made in those industries in which raw materials were most easily available. It is roughly estimated for example, that about 500 million rupees were invested in cotton textile plants from 1948 to mid-1955 : the investment in jute manufacturing started somewhat later, but had reached a total of perhaps 190 million rupees by the end of 1955.

52. Particularly promising as an opportunity for new investment is production from raw materials that are available but have not been put to use. Pulp for the manufacture of paper and paperboard can be produced from wild grasses. Such products can be made, in larger quantities, from bamboos. Tanning extract can be made from mangrove trees. Tung oil can be produced not only from nuts gathered on tea estates but also from new plantations of tung trees. Glucose can be made from starch produced from maize. In many cases, too, goods can be produced from industrial by-products that now go to waste. Paper can be made from bagasse, and power alcohol from molasses. Residual oil can be recovered from oil cake. Rayon and cellophane can be produced from cotton linters. Gelatine can be produced by tanners, and various chemicals by paper mills. Cosmetics can be made from wool grease, plastics from sawdust, caffeine from tea dust, insecticides from powdered tobacco and starch from broken rice. Utilisation of such materials, where they can be exploited economically, can contribute substantially toward increasing the nation's output and improving its balance of payments.

53. Looking ahead, according to the estimates of costs and returns available to us, among the most promising returns which are in sight for any new investment in the country are those connected with the use as fuel, or as raw material for chemical conversion, of the natural gas found at Sui and Sylhet. The gas pipelines from Sui to Karachi, and from Sui to Multan and then on to Lahore represent very heavy investments. But as soon as the amount of gas transmitted reaches sizeable quantities the pipelines can deliver gas at a low cost and the resulting contribution to national income and savings of foreign exchange will be high indeed. Combining natural gas as fuel with the limestone and gypsum which are found amply in the country can give us very efficient cement plants, thus satisfying a large requirement for many development needs with a relatively small cost in foreign exchange. A third highly promising industry based on natural gas is the manufacture of chemical fertilisers, which can be made from the gas by very efficient processes, to satisfy the country's rapidly growing needs. Other promising industrial fields based on the use of local raw materials are just manufacturing, sugar mills and paper plants. The returns from investment in those areas promise to be attractive, though not as high as from investments based on natural gas. Together, these investments in industries based primarily on local raw materials account for the bulk of the proposed investment in new large-scale plants during the Plan period.

54. It is vitally important to realise, however, that it is not simply the existence of a local raw material which determines the desirability of investment, but also the quality of that raw material, its location, and the efficiency with which it can be manufactured into finished products. Thus it would be technically possible to manufacture motor spirit from potatoes or other agricultural raw materials, but the process would be expensive. The country can gain much more by putting its capital into other uses which will earn or save far more foreign exchange per unit of investment, and continuing to import motor spirit to meet its needs. The question is not, therefore, solely whether raw materials are available locally, but whether products can be manufactured from those raw materials efficiently in relation to other possible investments. This point is sometimes overlooked in the natural desire to produce all the products the country needs within its own borders.

55. There are also promising investment opportunities in industries which use mainly imported materials in raw or semi-finished form, and assemble or fabricate them in the country into finished products. The gains in such cases, in comparison with the alternative of importing the finished products, come largely from savings on transport costs and from using local workers rather than paying for the labour of workers in other countries. There can often be a succession of steps in such cases, starting with the import of all the finished parts and simply assembling the product here, moving on to the manufacture of the simpler components here, and so on until possibly only the raw materials which cannot be found locally are imported, and the rest of the work is all done locally. The assembly and manufacture of radios is an example. Kits of components are now imported and assembled here, which can save considerable foreign exchange. The next step will be to manufacture the simpler

components, such as cabinets ; later it will be possible to make the simpler electrical parts—such as chokes-coils, and condensers—using imported raw material where necessary. Each step can add to the value of product produced in the country, to the savings of foreign exchange, and to the employment opportunities. There are many other examples of the same type of industrial development. In the pharmaceutical industry, for example, it will save very sizeable amounts of foreign exchange simply to produce bottles and labels in the country, rather than having to import them. Successive steps might be the local manufacture of filler materials, then some of the simpler chemical products, and so on. Many other examples could be cited.

56. In these cases, however, the economic efficiency of each step must be weighed. The country could, for example, start out now to manufacture large turbines for electric power stations, importing only the raw metal. This would be an extremely costly operation, however, requiring a very heavy investment and yielding a very low return. There are many alternative investments available at present which will be far more productive, and the manufacture of heavy electrical equipment would not be a good use of our limited resources at the present time.

Location of new capacity

57. In the earlier phase of industrialisation, industries have tended to congregate near a few main towns such as Karachi, Lyallpur, Narayanganj and Chittagong. This has been natural because of the facilities and economies available at such places. Karachi, in particular, has figured prominently, due to the advantages of the port, the special facilities of industrial estates, close proximity to the centres of administration, and the presence of a large business class that settled there on migration from India. On purely economic grounds, new capacity should be installed where the costs of production and transport will be lowest. But location cannot be determined on economic grounds alone. In the interest of balanced regional development and social stability, it is desirable that industries should be more widely dispersed, to spread the benefits of employment and increased income over larger areas. Dispersal will lessen the magnitude and intensity of the social problems created when populations are moved from rural to urban areas, inadequately provided with public facilities.

58. The Government already exercise the power of determining the location of new industrial units. The PIDC has used its opportunities freely to locate new units in areas close to sources of raw materials such as Chandragona, Nowshera and Daud Khel. More can be done, however, to encourage industries to spread out. The development of integrated systems of power supply, and the availability of natural gas in extended areas, could be utilised in support of such a policy. Consideration should be given, also, to the possibility of offering concessions in land, local taxes and freight rates. If undue concentration of industry is to be prevented, the Central and Provincial Governments, local bodies, railways and power authorities will have to follow appropriate policies.

Regulation and control of industrial development

59. Under the Pakistan Constitution Act in force from 23rd March 1956, industries have become a provincial responsibility, except "industries owned wholly or partially by the Federation or by a Corporation set up by the Federation". We assume however that the Development of Industries (Federal Control) Act, 1949, and the Rules issued under it continue to apply under Section 224 of the Constitution Act. Under the former Act all new industrial undertakings or expansions of existing undertakings likely to employ more than 50 persons must have specific authorisation from the Government. The basis on which the power of granting such authorisation will be distributed between Federal and Provincial Governments is not relevant to the general problem of public control. What is relevant is that the provisions of this Act apply only to 27 industries listed in the Schedule to the Act. Applications are required to be submitted to the Director General, Supply and Development, to the Textile Commissioner, or to the Ministry of Agriculture according to the nature of the undertaking.

60 Under the Control of Capital Issues Act all issues of capital above 1,00,000 rupees, whether original or supplementary, require approval by the Central Government. The Government are able also to regulate the development of industries through import controls, which, as far as can be foreseen, will have to be retained indefinitely in order to make the best use of scarce foreign exchange resources.

61. The controls provide the Government with effective instruments for exercising decisive influence on the development and regulation of industries. The Federal and Provincial Governments might well consider whether the authority vested in them for granting permissions to set up new undertakings or to expand existing undertakings is sufficiently complete for aligning the course of industrial development with their plans. The need for obtaining Government permission for new undertakings or expansions of existing undertakings should not be limited to 27 industries only.

62. These three separate types of control—over establishing or extending factories raising capital, and using foreign exchange—need to be co-ordinated to prevent anomalies which would give rise to uncertainties and grievances. It would be improper to grant permissions to establish plant which could not be honoured by the Capital Issue and Import-Control authorities, or to authorise capital issues which could not be backed by the necessary allocations of foreign exchange within a reasonable time. It seems desirable that one authority should be responsible at the Centre and one in each Province for co-ordinating the controls over industrial development. Co-ordination is also necessary between the Federal and Provincial Governments. We emphasise this because it is undesirable that the sanction of one authority should be used for applying pressure against another, or should give rise to justifiable grievances and to lack of confidence in the administration, but even more because without such co-ordination, maximum use of available resources at any given time in the desired directions would not be possible. It would also be an advantage if all entrepreneurs were able to approach a single public body for the necessary permissions and could look to it for support in their work, as part of the development plan.

63. In this connection, the question of the principles and procedures to be observed and the machinery to be used for selecting parties for setting up new units is very important and deserving of careful consideration. With a plan in being and fixed targets to be achieved, it would be necessary for the Government, acting through the proposed Industrial Planning and Development Department, or through some other suitable agency until that department is organised, to take the initiative themselves in selecting the promoters. They should not wait until applications are received, nor should they grant permissions to more parties or for larger capacities than are needed.

64. It is undoubtedly of some importance that new tasks should be assigned to those who can be trusted to accomplish them successfully. But this principle cannot be carried to the extent of allowing economic power to be concentrated in the hands of a few families or a few firms or individuals, whatever their resources and organising capabilities. This would be totally inconsistent with declared national policy of fostering conditions in which equality of opportunity prevails and economic power is widely distributed. In principle the distribution of economic power must be pushed to the farthest limit beyond which it ceases to serve the public good. In practice it is not easy to recognise and observe this limit. At the minimum, deliberate and consistent efforts should be made in relation to new industrial undertakings to discover and encourage new entrepreneurs in the effort to disperse control and ownership. To select those who already have enough on their hands is to judge others as incompetent. The soundness of such a judgment is clearly disproved by the fact that most of the successful industrial entrepreneurs had little industrial experience a few years ago. It is necessary that a procedure should be laid down for the selection of parties for undertaking new ventures. In important cases the selections should be approved finally by the Cabinet or a sub-committee of the Cabinet appointed for this purpose.

New investment in large-scale industries

65. Chapter 21 presents in detail the proposed new investment in individual large-scale industries, and the purposes for which this investment would be intended. These proposed investments are summarised in the following paragraphs.

66. There were, on 30th June 1955, about 3,000 factories employing more than 20 workers and using power, with a total investment in fixed and working capital of about 2,300 million rupees. The expansion targets established under the Plan call for the investment of another 3,000 million rupees of which 2,700 million would be

for new capacity and 300 million rupees for modernisation. Of these amounts about 1,600 million rupees would be private investment and 1,400 million rupees would be public investment, largely through the Pakistan Industrial Development Corporation. The foreign exchange component of the total investment is estimated at 1,900 million rupees. The division of past and proposed investment among major industrial groups is shown in Table 3.

TABLE 3
Investment in large-scale industry

Industry Group	Million rupees	
	Capital investment by mid 1955	Additional investment 1955-60
Agricultural processing	312	117
Food products industries	265	368
Textiles and clothing	796	695
Wood and paper products	91	186
Leather and rubber products	56	32
Chemical and Liquid Fuels	166	547
Brick, glass, cement, ceramics	88	142
Engineering industries	182	363
Electrical industries	27	39
Gas transmission and distribution	84	268
Other industries	193	261
Total	2,260	3,018

67. As shown in Table 3, the total proposed allocation for investment in specific industries is Rs. 3,018 million. In addition, the reserve for additional investments in East Pakistan in such industries as engineering, steel re-rolling, etc., is Rs. 355 million. Against these totals there is certain to be a considerable shortfall owing to such factors as delays in preparing detailed schemes, delays in construction, lack of managerial staff, etc. We have not made any estimate of the likely degree of shortfall in the industrial sphere. If, however, the percentages of shortfall which we have allowed for the Plan as a whole were applied to public and private investment in industry, the actual expenditures for industrial investment during the Plan period would be about 2,500 million. The foreign exchange component of this amount would be about Rs. 1,600 million. These, rather than the total amounts shown in Table 3, are the sums for which resources would have to be found.

68. Of the proposed investment of 3,000 million rupees, about 1,600 million is in producers' goods industries as against 1,400 million in consumers' goods industries. This would raise the share of investment in producers' goods industries from around 40 per cent at the beginning of the Plan period to around 45 per cent at the end. Major investments in producers' goods industries will be in cement, heavy chemicals, fertiliser, newsprint, and shipbuilding. In addition to the industrial investment included in this chapter, the Plan includes investment in capacity for manufacturing railway carriages and wagons and telephonic equipment and investment in the installation of power plants and transmission lines, included in the Chapters on Transport, Communications, and Power. A very large proportion of total investment under the Plan is thus in what is sometimes called "heavy industry", whose output is producer goods for further investment.

Executing the industrial development programme

69. The industrial development programme which has been summarised in this chapter is of very great importance to the country's welfare and progress. To execute this programme will require extensive and co-ordinated action by both Government and private enterprise. In most fields of industrial development it is not necessary for Government to make detailed decisions on how to expand and modernise individual industrial

establishments ; these are decisions which can be made with more precision and fuller awareness of all the factors by the businessmen directly concerned. Nevertheless Government must in present circumstances play a commanding role in assisting, guiding, and controlling industrial development. For the most part this will be done through import and capital issues controls, tax incentives and other devices for guiding private investment into channels which will best serve the country's welfare. In some cases it is necessary for the Government to establish industrial units either temporarily or permanently under its direct control. Furthermore, the Government must provide a wide range of supporting services—education, finance, research, advice—which are of great importance to industry both large and small.

70. The following paragraphs discuss the role of Government in encouraging, controlling, and supporting industrial development. We wish to emphasise, however, that the programme we are proposing cannot succeed without a very high degree of initiative and energy on the part of private businessmen. The targets we have proposed for private industry represent quantities of production which we believe are needed and can be wisely undertaken in the country. These targets will not be achieved, however, unless businessmen undertake the necessary detailed studies and make the necessary investments. Furthermore, while direct Government investment in industry can be assured by Government action, private investment will depend upon the vigour and initiative of entrepreneurs.

71. We are confident that private enterprise will not fail in performing its responsibilities under the Plan. In recent years private businessmen have given a good account of themselves in accomplishing the tasks undertaken by them and displayed considerable energy, initiative, and organising ability under trying and difficult conditions. We believe they can give an equally good account in carrying out the new tasks under the Plan, but they will need the full support of the Government, and the administration. The private sector should be treated as an agency for carrying out specific tasks envisaged under the Plan and thus fulfilling an essential social purpose. The administration should be helpful in its attitude and extend its goodwill and support. This need is even more pronounced in East Pakistan than in West Pakistan. The difficulties in the way of private industrialists are greater in the East and the administration there has to be correspondingly more helpful and also more willing to take direct initiative.

72. From the beginning the Government has actively stimulated industrial growth. The First Industries Conference was called in December 1947 and attended by representatives both of Government and of private business. The result was a basic Statement of Industrial Policy which still stands, virtually unaltered, as the Government's working policy. This policy statement sets forth the intention of the Government to plan the development of certain important industries, and to assist their growth through education, and training research, financial assistance, protective tariffs, tax incentives, encouragement to foreign capital, and other means. It is the avowed national policy to foster the private ownership of industries and to avoid direct Government action except when necessary to promote development, as through the PIDC. This policy has been accompanied by a rapid-rate of growth since independence and should not in our view be changed.

73. The Government have granted liberal tax incentives to industrial investment, in three principal ways :

- (a) High depreciation rates have been allowed for tax purposes under various arrangements, permitting industrialists to recapture their investment in plant and machinery more rapidly than the normal rates would permit ;
- (b) Profits of new undertakings have been free of income and super-taxes to the extent of five per cent of the capital invested for an initial period after the investment is made ;
- (c) Investments made by individuals in new industrial undertakings have been exempted from income and super-taxes up to certain percentages of personal income.

74. No estimates have been made of the effects of these tax incentives on the supply of capital for industrial investment, but they have undoubtedly given strong impetus to such investment by individuals, and have made available to companies large tax-free funds which could be re-invested in expansion. As was to be expected, it has been possible for firms and individuals to plough back the profits of initial investment into successively

larger enterprises. We have discussed this matter in Chapter 9 and suggested that while a continuation of tax incentives is desirable so long as they result in real additions to industrial investment, their application in the future should be made selective in order to stimulate development in the desired direction, and to avoid costly incentives which do not serve any important purpose.

75. As an additional source of capital for industrial investment, the Government established in 1949 the Pakistan Industrial Finance Corporation to grant loans and to underwrite issues of stocks and bonds. Plans have also been made to create an Industrial Investment and Credit Corporation to meet the equity capital as well as the medium and long-term credit requirements of industry. We discuss in Chapters 10 and 11, the problem of providing finance for industrial development during the Plan period.

76. The Protective Duties Act of 1950 established a Tariff Commission to recommend protection to domestic industries for temporary periods to help them become established and reach a competitive level of efficiency. Some degree of protection has been granted in more than 30 cases, ordinarily for periods of two to three years after which further claims are to be reviewed. No thorough study has been attempted of the effects of the protection which has been granted. It has undoubtedly assisted some local manufactures by raising local market prices, but the competition of imports has clearly been affected much more strongly by the strict controls on imports imposed not for protection but for balance of payments reasons.

77. Government controls over imported goods have certainly exercised more influence on industrial development than any other measure of Government policy, particularly since the open general licence was withdrawn in late 1952. These controls have had at least three types of result.

78. First, the Government has sharply limited the import of consumer goods and emphasised, so far as possible within the limits of the available foreign exchange, the import of raw materials and machinery and equipment for local production. The shift in the proportion among private imports has been marked. In 1951-52 about 54.6 per cent of all private account foreign exchange expenditure was for the import of industrial raw materials, capital goods, and spare parts, as compared with 76.2 per cent in 1954-55. This deliberate policy on the part of the Government has of course exercised a powerful effect in favour of industrial development.

79. A second effect of the strict import controls has been to leave many importers with unused capital, owing to the sharp cuts in import of consumer goods, and some of them have turned to industrial investment for the first time. This indirect effect of the import controls has clearly been favourable to industrial development.

80. The third effect of import controls has not been so favourable. Foreign exchange has not been available in sufficient quantities to permit the import of all the raw materials, capital goods, and spare parts that could have been used, and even though Government policy was far more favourable to such items than to consumer goods, the stringency of exchange has been such as to leave many demands unsatisfied. This has meant that many investment plans have had to be postponed or shelved because licences for plant and equipment could not be granted. It has also meant that it has not been possible to import all the raw materials needed to operate existing plants at full capacity. This has resulted in a great deal of inefficiency in production, with plant and machinery less than fully used, extra costs for frequent stopping and starting, and other effects contributing to low volume and high-cost production. This situation has not been favourable to further investment in certain fields.

81. The magnitude and complexity of the problem of licensing the import of industrial equipment and materials cannot be over-emphasised. Since the foreign exchange stringency will undoubtedly continue for some time, it seems that import licensing is a continuing necessity. Considering the pervasive influence of licensing on every aspect of the industrial economy and development—its impact on industrial investment, its grip on established manufacturers who depend on raw material imports, its possible susceptibility to influence—considering these influences for good or bad, the import licensing system must be the best that can possibly be devised. Certainly the present system leaves much to be desired and improving it should be an undertaking of high priority.

82. It is essential that the policy on import licences for capital equipment should correspond to the Government's industrial development programme. This is a field in which the Government can intervene most directly to influence the size and pattern of development ; without such co-ordination there would be grave dangers of waste and frustration.

83. The problem of import policy for raw materials and replacement parts is more involved and difficult. No one knows precisely what the country's industrial requirements are, what part of these requirements are reasonable in view of the need for austerity of production of non-essential goods, or which of these requirements could be supplied from domestic sources. The Ministry of Industries is now attempting a survey of requirements, the results of which should improve the position. A procedure for keeping this information up-to-date is also essential.

84. Because of the scarcity of foreign exchange, the inevitability of its distribution on the basis of a priority system, and the inadequacies of import control administration, industry has suffered in recent years. The imports of industrial raw materials and replacement parts have been insufficient, and often small and fitful. The plants have not worked to their full capacity or on regular production programmes. Their overheads and unit costs of production have consequently been high. The operation of existing industrial units and the efficient maintenance of plants must be regarded as a high-priority claim to the use of foreign exchange resources.

The allocation of foreign exchange for the import of raw materials and replacement parts is governed by the following main principles :

- (a) Repair and replacement parts should be allowed to the full extent of proved need.
- (b) Raw material for producer and essential consumer goods industries should be allowed similarly to the full extent.
- (c) Other consumer goods should be allowed on an austerity basis.

While this system of priorities is sound, it has not been fully applied because of scarcity of foreign exchange, the lack of reliable information about actual needs, and the desire of the administration to avoid accusation of partiality.

85. The position should be alleviated if not completely rectified in the next few years. In projecting the requirements of foreign exchange in the Plan period we have assumed that the present basis for priorities will continue, and that every effort will be made to make them effective. So far as we can determine, an average of about 500 million (post-devaluation) rupees of industrial raw materials, fuels and replacement parts were imported in the trade years 1952—55. This level of imports is undoubtedly inadequate. Our estimates of requirements provide for increasing imports of these items from an annual average of about 500 (post-devaluation) rupees for 1952—55 to close to 800 million rupees for 1959-60. The availability of raw materials will be higher than these figures indicate since many materials which had to be imported in the past will be locally available in 1959-60. This is especially true of cotton and art silk yarns, heavy chemicals and paper. Consistent efforts to substitute local for imported materials by locating new sources or increased production by multiple-shift workings should bring about a substantial improvement within the Plan period. The inquiry in progress in the Ministry of Industries should provide a realistic estimate of the raw material and spare parts requirements of industries and enable allocations of foreign exchange to be made in closer relationship to genuine needs.

86. It is one of the main objectives of the Plan that the foreign exchange position should be improved as rapidly as possible so that the country should be able to finance a sizeable development programme from its own resources. A diversified but balanced programme of industrialisation, including the creation of new capacity on a selective basis, is essential in pursuance of this objective. We understand the view often voiced in business circles that all new industrial capacity should wait till a surplus of foreign exchange is available after meeting in full the requirements of existing industries. The view is based on an inadequate appreciation of the needs and potentialities of development. It is essentially a short view which, if accepted, would prolong indefinitely the period needed to improve the balance of payments position in order that the country should be able as soon as possible to provide from its sources the foreign exchange required for meeting its ordinary as well as development needs. Some degree of austerity in the present is fully justified as the price of future benefit.

87. We expect that the projections we have made of foreign exchange requirements will prove adequate to accommodate imports of raw materials and spare parts to meet all genuine requirements on the basis of the priorities we have mentioned above. They have been made on such information as has been available, and are subject to revision and to amendment as more and better information comes to hand.

88. Partly because of the shortage of foreign exchange, but also because of its inherent advantages, the Government have from the beginning followed policies designed to encourage private foreign investment in Pakistan. Such investment not only provides a means to finance the import of capital goods, but also frequently brings with it valuable experience and access to technical and managerial skills. Government policies to encourage foreign investment have included guarantees of repatriation of profits and capital investment, assurances against loss from nationalisation, and permission for foreign owners to hold a majority of the capital stock in Pakistan companies.

89. These policies seem sound and should be continued, though it would be unrealistic to expect large amounts of foreign private investment to be made during the Plan period. In the past, foreign investment has been devoted primarily to the exploitation of raw materials which are now being developed by local interests. On the other hand, a compensating amount of foreign investment in processing and manufacturing industries cannot be expected because the opportunities in such industries are likely to be more attractive in the investors' home or colonial countries than they are here—a situation not true of Pakistan alone, but of most under-developed countries. Nevertheless, we expect a steady though small flow of foreign investment into the country, and a fairly large increase of investment in exploration for oil. In addition, organised efforts must be made to attract foreign investment. Effective arrangements should be made to bring to the notice of potential investor, groups and individuals in countries with surplus capital the opportunities of investment in Pakistan. Development studies of individual schemes made by specialists would provide useful material for this purpose. Arrangements should exist to promote contacts between Pakistan entrepreneurs entrusted with specific tasks, and, likely investors abroad. The potentialities of new types of arrangements with foreign suppliers of plant and machinery should be fully explored under which the sales of their goods are combined with participation in capital and responsibility for successful installation and operation of the plant for periods which would make such arrangements worthwhile to both parties. This type of arrangement would be particularly suitable for large capital intensive undertakings offering prospects of steady demand for the manufactures of the foreign participants.

90. The general measures discussed in the preceding paragraphs are necessary, but they are not sufficient to ensure that the specific tasks envisaged in the field of industry to fulfil the Plan and achieve the desired targets will be duly taken in hand and completed. The programme we contemplate is large and varied; and its implementation would need the fullest encouragement and utilisation of the potentialities of the public and private sectors. In the public sector an effective agency for executing desired programmes has been built up in the form of the PIDC, which must be improved, expanded and perfected. This Corporation is an instrument for carrying out specific tasks assigned to it, but not for the comprehensive planning and development of industry. Nor has it any responsibility towards the private sector. There is no organised centre for the planning of industry for examining, studying, and regulating its policies; for distributing the programme between the private and public sectors; for extending to the private sector necessary technical aid, and for assisting it in solving its many problems in such matters as finance, land, raw material, spare parts, transport, import licences, and the like, which hamper its operations. In our recommendations on planning organisations we have stressed the need of establishing planning groups in all Ministries and Departments where they are needed, such as Industry and Agriculture. The need of such an organisation is clear and urgent in industry, and has been brought home to us forcibly in the course of our work.

91. We accordingly recommend the creation of an Industrial Planning and Development Department in the Central Ministry of Industries, and as soon as possible, of parallel organisations in the two Provinces. In the Centre the nucleus for this organisation should be formed by splitting off the Development part of the Directorate of Supply and Development, leaving the supply function as a separate operation to be organised as a business-like Government purchasing service for the Centre only or for the Centre as well as the Provinces, as may

be decided. This step is necessary to free the officials concerned with planning and development from the narrower but very heavy load of routine purchasing activity, which pushes planning and development into the back ground.

92. This organisation should be staffed with technically-qualified men : scientists, engineers, technologists and economists, though a few men with general administrative experience and capacity would be needed to deal with issues of general policy, and to ensure the efficient working of the organisation. Essentially, however, it should be viewed as a technical organisation and built up as such. A steady programme of staff development should be started immediately, and once it has been brought to a minimum level of strength and efficiency at the Centre, it should assist in the formation of similar centres in the provinces. They will all be needed to enable the Central and Provincial Governments to discharge their large and growing responsibilities towards industry whether in the public or the private sector.

93. The Industrial Planning and Development Department would be concerned with the following major functions :

- (a) To conduct the necessary industry surveys in order to maintain a continuously up-to-date set of plans and programmes for the development of all important industries in the country, large and small.
- (b) To provide technical advisory services both for the establishment of new plants and for improving the operations of existing plants, either directly with its own staff, supplemented by experts provided by foreign aid agencies, or through encouraging the provision of these services by others, such as the Productivity Centre.
- (c) To advise the Government in selecting private firms or individuals for specific industrial projects needed to give effect to sanctioned industrial plans and targets.
- (d) To extend whatever assistance is needed by private parties selected for specific tasks to fulfil them successfully. In a way the Government should also perform services similar to those rendered, by consulting firms ; either directly with their own staff, supplemented with foreign experts whose services are provided by foreign aid agencies ; or by facilitating agreements between private Pakistani interests and foreign consulting firms ; or by obtaining the services of foreign experts for employment with private parties, while remaining attached to the Government.
- (e) To present the interests of industrial development to other Government organisations concerned with import controls and allocations, the provision of fuel and power, industrial finance, technical education and other matters of importance to industry.
- (f) To stimulate and guide industrial research—on markets and consumption, on processes and methods and on materials.

94. Private groups entrusted with new projects should be selected carefully in accordance with prescribed policies of the Government, but after a selection has been made, the Government must take the utmost care to see that every assistance is afforded to the organisation concerned. The realisation of the sanctioned Plan will present problems of all kinds and the Government should develop a kind of partnership with the selected parties to secure the accomplishment of desired tasks. If the private sector fails in any respect because of shortcomings which could be remedied by administrative action, the Government must be responsible for the failure in the same way as for the failure of an undertaking in the public sector. An attitude of detachment or patronage would be mistaken and risky. The Government must recognise their full responsibility for the fulfilment of the Plan, and face in a spirit of partnership the tasks belonging to them under a well-devised scheme of responsibility distributed between the public and private sectors. With a national plan of development in action, the distinction between a scheme undertaken in the public sector and schemes undertaken by the private sector is one of the agency employed, not one of desirability or essentiality. All of them must be recognised as essential national enterprises ; the distinction now often made in practice in the granting of licences and other facilities is unfair. If at any given time priority considerations have to prevail, distinctions should be made on other essential grounds and not on the basis of agency employed.

95. Our programme includes a provision of nearly 300 million rupees for the improvement and modernisation of a large number of industrial units. Special action would be needed to prepare and carry through the schemes of modernisation appropriate to each case. A considerable amount of technical and administrative work would be involved. The owners have to be convinced that the schemes proposed would be beneficial to them. Facilities would have to be provided to enable them to implement the schemes efficiently and speedily. Their difficulties would have to be studied and ways and means devised to overcome them. The Industrial Planning and Development Department must be assigned the responsibility of facilitating, supervising, and implementing this programme. The part to be played by them would be determined in each case by the status, attitude, and resources of the private owner concerned.

96. We recognise that modernisation will present more serious problems than the establishment of new capacity because in the latter case it is open to the Government to nominate by deliberate selection the party most likely to be able to accomplish the task. We must therefore reckon on the possibility of delays in the achievement of the programme, and its extension into future Plan periods. Schemes for the creation of new capacity should be kept ready to take advantage of any available resources.

97. The Industrial Planning and Development Department will in part be rendering services which in advanced countries are performed by consulting firms. It should be entitled to recover the cost incurred for services rendered on a no-profit and no-loss basis. We contemplate that in due course of time these duties should be transferred to one or more separate organisations as a step towards the creation of consulting organisations in the country, to be fostered as an essential component of the industrial planning structure.

98. The Industrial Planning and Development organisation should be concerned with small as well as large-scale industries, but separate and special organisations are necessary to promote the development of small-scale and cottage industries. At present the Small Industries Corporation is in existence, though its programme is only a small part of what is needed for a full-scale attack on the problems of small business. The Small Industries Corporation and the part it will play in implementing the development Plan are discussed in Chapter 22.

Direct Government investment in industry

99. The Government's direct investment in industry has taken place in recent years primarily through the Pakistan Industrial Development Corporation. In addition, Government manufacturing enterprises exist in the fields of military ordnance (not considered as part of the development programme), railway carriages and wagons (discussed under Transport), and telephone equipment and line stores (included under Communications).

100. The Government has also assisted industry by setting up industrial trading estates in several places. The purpose is to provide entrepreneurs with land already prepared with roads, water supply, power, and rail sidings at reasonable prices. This facilitates establishing new factories and reduces the investment that would otherwise be required if such utilities had to be supplied by each factory separately. Experience with the Sind and Landhi industrial estates at Karachi has demonstrated their effectiveness as an aid to industrial development. Further Government investment in industrial estates both for large-scale and small-scale industries is expected during the Plan period. We think, however, that there will be need in the country for more schemes of industrial estates than we have received and included in the Plan. Additional schemes should be prepared and kept ready for implementation when the need is felt and the necessary resources become available. This matter is further discussed in Chapter 21.

101. We are proposing a very large programme for execution by the P. I. D. C. during the Plan period. The total investment for new capacity in enterprises in which the P. I. D. C. is expected to assume leadership will be about 1,640 million rupees, of which we have assumed that 250 million will be provided by private investors and 1,390 million by the Government. This represents more than three times the total investment and more than four times the Government investment in all the 30 P. I. D. C. projects undertaken before the Plan period began. When considered in addition to the burden of operating completed establishments, this programme assumes proportions that cause some misgivings.

102. The recommended P. I. D. C. programme is composed of about 30 new projects. Details of the programme are presented in Chapter 21, which shows the large-scale industry development programme in detail. Major enterprises proposed for the P. I. D. C. include : additional jute looms, sugar, cement, fertilizers, newsprint, gas transmission and distribution, card and strawboard, hardboard, pharmaceuticals, DDT, caustic soda and shipyards.

103. The PIDC has been markedly successful in supervising the preparation of engineering plans and designs and the construction of plants. A number of very sizeable enterprises have been established rapidly and with reasonable efficiency, and the Corporation has proved its worth in this regard. Its form of organisation has given it a good deal of freedom to hire staff and make operating decisions without the customary detailed procedures and controls that apply to ordinary Government departmental operations. On the whole, this degree of administrative freedom has been well used and its continuation is warranted.

104. As the Corporation's activities have grown, however, it has encountered new problems which have not been adequately solved. Some of these stem from the fact that the Corporation has been given responsibility for more and more fields of activity and for more and more units. The Corporation is necessarily large, it has accomplished its tasks successfully, and has still larger tasks to perform in the future. It must not, however, be allowed to become unwieldy and inefficient.

105. A second type of problem arises because the Corporation has finished the construction of a number of industrial establishments, and is now facing the task of operating them and distributing and marketing their products both domestically and abroad. Operating and marketing problems are of a very different nature from those of engineering design and construction, and require a different range of skill and different organisational arrangements and systems of control.

106. A third type of problem faced by the Corporation relates to policy research and planning. At present the Corporation's plans look ahead ordinarily for only two or three years. It badly needs an economic staff to assist the Board of Directors in analysing current policy issues, the results of past operations, and future plans. The Corporation also should prepare plans for a longer period in advance, in order to give the Board and the Government a better basis for decisions on the future scope of the Corporation's work.

107. In view of the number and magnitude of these problems, we strongly recommend that the Corporation should conduct a thorough review of its activities, organisation, and methods of doing business. It would be well to obtain expert assistance in making such a study of organisation and management—assistance preferably from men with experience in some of the large and diversified undertakings in other countries.

108. The P.I.D.C. performs for the country the function of constructing new industrial units and establishing them as going concerns in certain cases in which private enterprise is not forthcoming. Once the industrial units are established private owners are given the opportunity to purchase the Government's share in the ownership. Eventually therefore the units established by the P.I.D.C. should all be privately owned ; it could be said that one measure of the success of the Corporation is how rapidly and how completely it is able to divest itself of its holdings. Frequently this is not an easy task, as the Corporation by its nature embarks on some projects which might not for some years reach a condition of profitability by the usual commercial standards, and which might not therefore attract private buyers. Furthermore there are cases in which sale to private owners might, unless very careful safeguards are established, result in monopoly conditions to the detriment of consumers. Nevertheless temporary Corporation ownership of industrial plants should remain the cornerstone of Government policy on direct investment in industry. Not only is this in keeping with the basic attitude of the country towards private enterprise, but it is necessary also to prevent the Corporation from becoming an excessively large holding company for a large part of the country's industry.

Results of the industrial programme

109. Table 4 shows the effect of the development programme on investment and capacity in major industries. It includes all those that are expected to have an investment, by 1960, of more than 50 million rupees. The programme will leave the cotton textile industry at the head of the group, in terms of capital invested, but will increase the relative importance of fertiliser production, sugar refining, gas transmission, cement manufacturing, and shipbuilding. It will increase the capacity of the jute goods industry by three quarters. It will double the capacity in sugar, cigarettes, and cement, and quadruple capacity in shipbuilding. It will provide capacity where none existed before the production of fertiliser, card and strawboard, newsprint, and rayon and cellophane.

TABLE 4

Investment and capacity increase, 1955—60 for industries in which capital investment will exceed 50 million rupees by 1960.

Industry	Investment				Capacity			
	Capital invested (3) 1955 (Rs. Million)	Capital invested 1960 (Rs. Million)	Rank in Group (1) 1955	Rank in Group (1) 1960	Units	Capacity 1955 (3) (In units shown)	Capacity 1960 (In units shown)	Per cent Increase in Capacity 1955—60
Cotton textiles ...	530	912	1	1	Million spindles	1.60	2.20	38
Jute goods ...	186	286	2	3	Looms ...	7,000 ⁽²⁾	12,000	71
Cotton ginning ...	134	151	3	6	Million bales ...	2.0	2.25	13
Edible vegetable oils ...	105	116	4	10	Tons ...	220,000	227,500	3
Medium and light engineering.	104	151	5	7	Rs. million ...	130	176	35
Jute baling ...	88	90	6	12	Million bales ...	7.0	7.2	3
Sugar ...	87	369	7	4	Tons ...	115,000	235,000	104
Gas transmission ...	84	298	8	5	... ..	...	...	...
Cement ...	66	145	9	8	Million tons ...	0.67	1.28	91
Printing, writing and wrapping paper.	60	604	10	18	Tons ...	30,000	42,000	40
Fertiliser ...	56	388	11	2	Tons ...	Nil	3,86,200 ⁽⁵⁾	All new capacity.
Woollen textiles ...	50	64	12	15	Spindles ...	30,790	47,040	53
Tea manufacturing ...	50	56	12	17	Million lbs. ...	55.0	60.0	9
Cigarettes ...	49	80	13	13	Million cig. ...	4,500	10,000	120

(1) In order of total productive capital invested.

(2) These were looms on hand. Many were not installed, and some of those installed were not operating in 1955.

(3) Taken from table 1, Chapter 22.

(4) Investment for increased capacity is included in cost of newsprint plant.

(5) Only 62,000 tons capacity during the Plan Period and the balance afterwards.

TABLE 4—contd.

Industry	Investment				Capacity			
	Capital invested (3) 1955	Capital invested 1960	Rank in group (1) 1955	Rank in group (1) 1960	Units	Capacity 1955(3) (In units shown)	Capacity 1960 (In units shown)	Per cent increase in Capacity 1955—60
	(Rs. Million)	(Rs. Million)						
Shipyards	35	145	14	9	Rs. million	30.0	127.2	324
Card and Straw Board	26	76	15	14	Tons	Nil	35,000	All new capacity.
Soda ash and Caustic soda	16	55	16	21	Tons	25,000	97,000	288
Newsprint	Nil	115	...	11	Tons	Nil	23,000	All new capacity.
Rayon and cellophane	Nil	70	...	16	Tons	Nil	5,400	All new capacity.
Gas distribution	Nil	54	...	20	...	...	...	...

110. We can now give some general estimates of the aggregate results to be achieved by the large-scale industrial development programme during the Plan period. The most important of these are the effects on production, national income, employment, and the balance of payments. We estimate that the programme we propose, when allowance is made for the expected shortfall in investment, will increase the value of output of large-scale industry from Rs. 3,400 million in 1954 to Rs. 6,400 million in 1960. Of this increase of Rs. 3,000 million, about Rs. 800 million will be due to increased utilization of existing capacity and Rs. 2,200 million to investment in increased capacity. The gross value added by manufactures will rise from about Rs. 1,190 million in 1954 to roughly Rs. 2,140 million in 1960, a gain of about Rs. 950 million. This is also a gross measure of the increase in national income resulting from the large-scale industry investment programme. We wish to emphasise that these figures are rough estimates, meant only to give an idea of the order of magnitude of the value of production that can be expected from large-scale industry. As a result of the proposed development programme and the fuller use of existing capacity, production in large-scale industry in 1960 should increase by about 80 per cent over the level of 1954. Much of this increase will come in the major sectors of P.I.D.C. activity. Organised factory production should contribute a substantially larger share to the national income of Pakistan.

111. Direct employment in large-scale industry is expected to increase by about 2,35,000 persons as a result of the development programme, raising the total from 3,90,000 in 1954 to 6,25,000 in 1960. Of the additional jobs, 2,500 will be in the category of professional workers, 1,600 will be technical personnel, 1,31,000 will be skilled and semi-skilled workers, and 1,00,000 unskilled and clerical. The programme will have considerable effect in the form of indirect employment although this is not measurable. Thus, although the new cement plants will employ only a few hundred people, the new construction work undertaken with the readily available cement will employ thousands.

112. To calculate the net effect of the large-scale industry investment programme on the balance of payments, we note that the annual increase in value of product resulting from the new investment will be about 2,200 million rupees, of which the import component will be about 1,200 millions, leaving a potential favourable effect on the balance of payments of 1000 millions rupees. This effect will, however, not be realised,

because some of the goods produced do not replace imports, and in the case of some consumer goods, there will be increased consumption due to increased availability. This is true especially of cotton, cloth, sugar and cigarettes. We estimate that the true net effect on the balance of payments would be about 500 million rupees. This Rs. 500 million is the potential foreign exchange earnings and saving resulting from the increased capacity provided in the industry programme. It is not equivalent to the forecast of the foreign exchange balance made in Chapter 11, since that balance involves earnings and uses of foreign exchange other than those resulting from industrial development.

113. The proposed industrial development programme is expected to complete the process of making the country self-sufficient in cotton and jute textiles, sugar, edible oil, cigarettes, paper, newsprint, strawboard and hardboard, leather goods, sulphuric acid, soda ash, caustic soda, penicillin and many other chemicals and drugs, cement, a variety of electrical goods, and a large number of other items. It will be possible to meet the bulk of the country's requirements of fertilisers, woollen textiles, canned fruits and vegetables, rayon and cellophane, and hollow glassware. Natural gas will replace a large quantity of fuel that would otherwise have to be imported. Local manufacture of capital goods will be increased, and this will reduce somewhat the imports required for economic development in the future. Exports of jute manufactures will be increased greatly. Substantial quantities of cotton yarn and cloth will become available for export. In short, the country's dependence on imported goods should be considerably reduced, and export earnings increased.

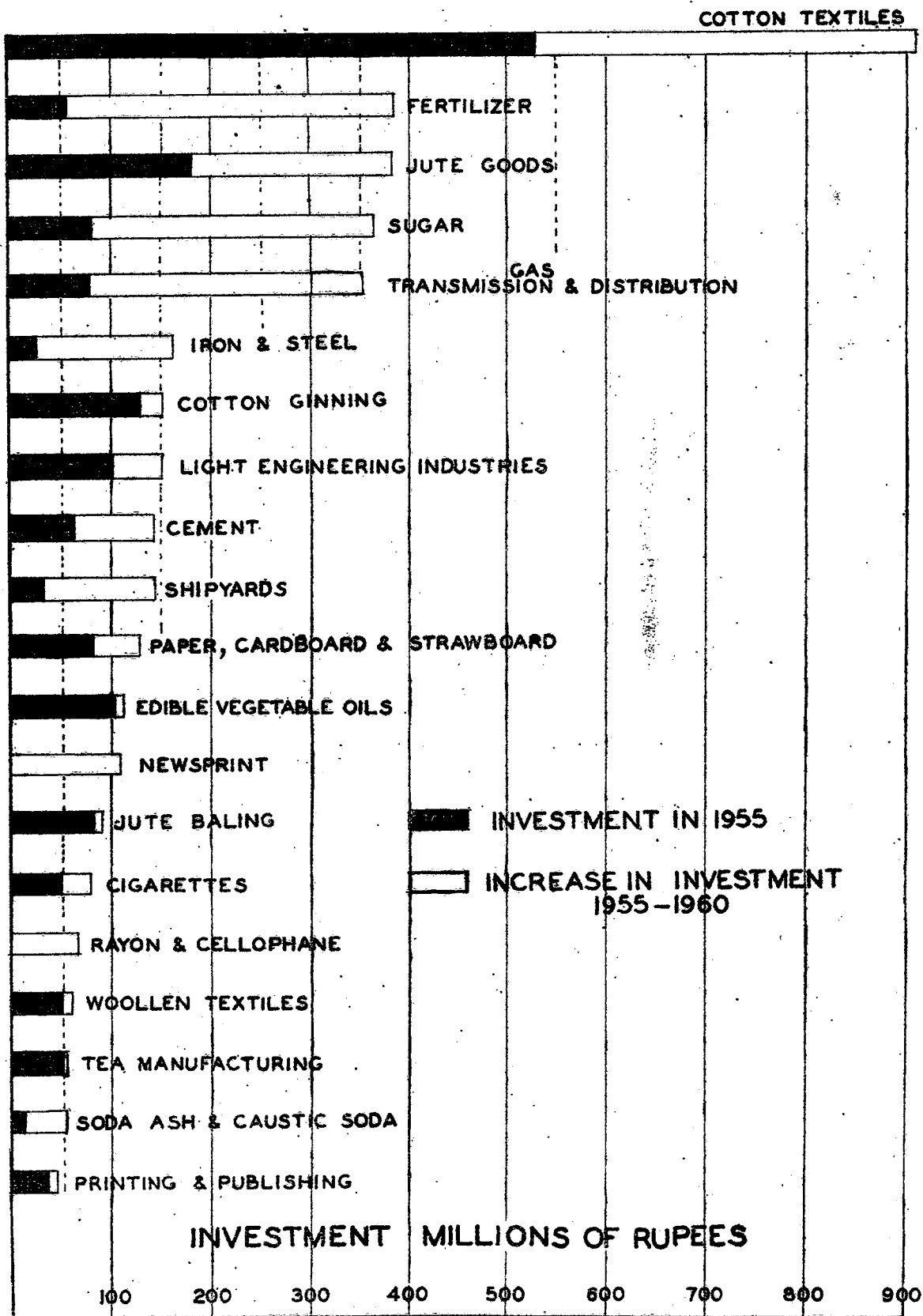
114. The results of the small-scale industry investment programme are not as easily measurable as those of the large-scale programme. Physical results will be more difficult to see, because they will be spread over thousands of small units, and in most cases will represent modernisation and improved methods and larger working stocks rather than new plant. The Plan provides for improving the efficiency and output of many small scale and cottage industries, such as *gur*, vegetable oil, salt, *bidi* making, hand-loom weaving, ready-made garments, knitted goods, sports goods, bamboo ware, furniture, footwear, brick and tile, pottery, soap, surgical instruments, cutlery, household utensils, umbrellas, textile dyeing and printing. The programme for developing small-scale and cottage industries includes the establishment of centres for training, management advice, and research ; the provision of credit and special assistance with materials and marketing ; increasing the efficiency of tools and equipment by such means as improved handlooms ; and the provision of small-industry extension services particularly in connection with the Village Aid programme.

115. Table 2 of the Chapter on small scale and cottage Industry shows a total production from small-scale and cottage industries in the year 1954 of about 4,100 million rupees. An increase in the value of production of about 1,000 million rupees may be expected by 1960 through the improved flow of raw materials and better utilisation of existing facilities. If the same ratio of production to investment prevails in 1960 as in 1955, perhaps another 1,500 million rupees increase in production can be expected as a direct result of the investment programme, bringing the total value of annual production from small-scale and cottage industries to about 6,600 million rupees by the year 1960. These are very rough estimates, but they serve to give an idea of the magnitude of potential production from small-scale industry.

116. Although the effect on employment levels in the small-scale sector will be greater perhaps than the direct result in the large-scale sector, there is no way in which it can be measured. In many cases increased production will come through fuller employment of the present work-force by working more hours per week rather than by bringing new people into employment.

117. In summary, the total development programme for both large and small-scale industry may be expected to increase the output of all industry from about 7,500 million rupees in 1954 to about 13,000 millions in 1960. The programme for large-scale industry alone should increase direct employment by about 2,35,000 jobs. It should result in a saving, by 1960, of more than 500 million rupees a year in foreign exchange,

PLANNED EXPANSION OF INVESTMENT IN MAJOR INDUSTRIES, 1955-1960



STATEMENT OF INVESTMENT

DATE	DESCRIPTION	AMOUNT	CURRENT BALANCE
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STATEMENT OF INVESTMENT

Chapter 22

LARGE-SCALE INDUSTRY

INTRODUCTORY

1. The term "Large-scale industry" ⁽¹⁾ refers only to factories and plants required to register under Section 2 (j) of the Factories Act, 1934, by virtue of having twenty or more employees and using power. Industrial investment in factories or plants which do not qualify for registration under this section of the Factories Act is discussed in Chapter 23 dealing with "Small-scale and cottage industries".
2. Table 1 presents the large-scale industry investment programme, 1955—60. The 60 major industries listed account for all large-scale industries in which public funds are invested and over 90 per cent of purely private industries.
3. There were on June 30, 1955, about 3035 factories ⁽²⁾ qualified to register under section 2 (j) of the Factories Act, together employing a total fixed and working capital of about Rs. 2,260 million. The expansion programme calls for the investment of an additional Rs. 2700 million for new capacity and Rs. 300 million for modernisation, a total of Rs. 3,000 million. Of this, it is expected that Rs. 1,400 million will be invested by the P.I.D.C. The foreign exchange component of the total investment is expected to be the equivalent of Rs. 1,900 million. Upon the completion of this investment programme the annual increase in value of product will be about Rs. 3,000 million, of which the import component will be Rs. 1,130 million.
4. This and the following several paragraphs are in explanation of Table 1. Column (1) lists the 60 major industries for which capacity goals are set. They were chosen because of their importance to the national economy, either by virtue of the amount of capital invested in them, or because sizeable investment is recommended during the Plan period. The industries listed represent, in addition to those scheduled to the P.I.D.C., over 90 per cent of private industrial investment.
5. Column (2) states the number of factories existing in working order as of June 30, 1955, for each of the industry sectors listed. This is the number which qualify as factories under the Factories Act, whether or not they are registered.
6. Column (3) is the effective annual capacity existing in the factories listed under column (2) at June 30, 1955. This is not merely "rated" capacity, but is a measure of the actual production obtainable from these factories, given sufficient raw materials and facilities. This is the production expected from these factories during the Plan period.
7. Column (4) presents in millions of rupees the total productive capital invested in the factories listed under column (2) at June 30, 1955. It includes both working capital (stocks, payroll, funds, etc.) and fixed capital (land, plant, equipment, etc.).
8. Column (5) is the expansion in effective capacity to be brought about by the end of the Plan period.

(1) "Industry" here is to be interpreted in the same sense as throughout the industry chapters of the report. It does not include mining, quarrying, or fuel extraction, transport companies or the manufacture of railway equipment, ordnance factories, municipal services, generation or transmission of electricity, construction, commercial and financial institutions service companies, tea gardens and forestry operations, fisheries and merchant shipping.

(2) This includes an estimated 450 powered cotton gins, employing less than 20 persons and, therefore, not strictly registerable under section 2 (j).

9. Column (6) is the expected total actual capacity by the end of the Plan period. This is also the expected production, since it is assumed that raw materials and facilities will be made available for practically full operation of this capacity.

10. Column (7) states in millions of rupees the investment required to bring about the expansion of column (5). This includes both fixed and working capital.

11. Column (8) presents the estimated investment in millions of rupees required to modernise, where necessary, the existing capacity of column (3). It has nothing to do with increased capacity but, by definition, merely replaces old capacity. It is assumed that for each unit of capacity added through modernisation, and equivalent unit of obsolete capacity will be retired. Column (9) is the total of Columns (7) and (8).

12. Column (10) gives that portion of the total investment which it is estimated will be provided by private sources. Except for those industries in which the P.I.D.C. is engaged, it is equivalent to the total investment. For industries in which the Government is investing through the P.I.D.C., the amount shown under column (10) is either the estimated private subscription in P.I.D.C. projects, the sale of P.I.D.C. projects to private interests upon completion, or else strictly private projects in that industry. The fact that the P.I.D.C. invests in an industry is not taken to remove it from the sphere of private development. In such industries as sugar, jute, cement, fine chemicals and drugs, where considerable expansion is expected in the Plan period, private industrialists are urged to start purely private projects.

13. Column (11) presents an estimate of the portion of the total investment which will be made through the P.I.D.C. and other public agencies.

14. Column (12) is the rupee equivalent of the foreign exchange component of the total investment shown in column (9).

The Public investment programme

15. The investment programme recommended for the Pakistan Industrial Development Corporation and other public bodies is contained in Table 1. This programme is shown alone in Table 2. The total investment for increasing capacity in these industries is set at 1,640 million rupees, of which it is expected that about 250 million rupees will come from private sources and about 1,400 million rupees from the P.I.D.C. and other public sources. A discussion of the P.I.D.C. projects and schemes which are summarized in these tables is contained in the detailed sector studies which follow.

16. Of the public investment shown in Table 2, it will be noted that 910 million rupees is assigned to East Pakistan, 390 million rupees to West Pakistan, and 92 million rupees to Karachi, giving 65 per cent of new public investment in large-scale industry to East Pakistan, 28 per cent to West Pakistan, and 7 per cent to Karachi. In addition to the foregoing, further provision has been made for industrial development in East Pakistan by setting certain sums aside from the reserve for that province, pending the preparation of specific schemes. These set-asides include 47 million rupees for additional sugar mills, 15 million rupees for an antibiotics plant, 8 million rupees for capacity to manufacture dyestuffs, and 100 million rupees for engineering industries, making a total of 170 million rupees.

Industry studies

17. The following studies present in summary form an analysis of the present position, need for expansion and improvement, and recommended investment programme for each industry included in Table 1. For convenience, a list of these industries is given on page 436 in the order in which they are discussed in this section.

TABLE 1

Large-Scale Industry Investment Programme, 1955-60.

Sector	No. of factories	Effective annual capacity	Productive capital invested (Rs. M)	Increase in effective capacity	Total effective capacity (1960)	Investment in increased capacity	Investment in modernization	Planned Capacity Increase (1955-60)				Foreign Exchange component of total investment (Rs. M)
								Total investment (Rs. M)	Private investment (Rs. M)	Public investment (Rs. M)	12	
1	2	3	4	5	6	7	8	9	10	11	12	
AGRICULTURAL PROCESSING												
Cotton ginning ...	(1) 807	(2) 2.0 M bales	134.4	0.25 M bales	2.25 M bales	16.2	68.0	84.2	84.2	Nil	46.4	
Jute baling ...	78 presses	7.0 M pucca bales.	87.6	0.16 M pucca bales.	7.16 M pucca bales.	2.0	2.0	4.0	4.0	Nil	2.0	
Tea manufacturing ...	119	55.0 M lbs.	50.0	5.0 M lbs.	60.0 M lbs.	6.0	4.7	10.7	10.7	Nil	4.4	
Milling :												
(a) Wheat ...	40	(3) 0.921 M tons milled wheat.	24.0	0.101 M tons	1.022 M tons	6.2	3.6	9.8	9.8	Nil	5.3	
(b) Rice ...	219	2.0 M tons milled rice.	15.7	0.15 M tons	2.15 M tons	6.0	2.4	8.4	8.4	Nil	5.0	
Sub-total ...	1,263		311.7			36.4	80.7	117.1	117.1	Nil	63.1	

(1) This includes all ginning factories employing power regardless of the number of employees.

(2) M—Million.

(3) Long tons of 2,240 lbs.

PAPER

Printing, writing and wrapping paper.	1	30,000 tons	60.0	12,000 tons	42,000 tons	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Newsprint ...	...	Nil	Nil	23,000 tons	23,000 tons	115.0	Nil	115.0	Nil	115.0	Nil	81.7
Card and straw board	...	Nil	26.2	35,000 tons	35,000 tons	49.8	Nil	49.8	Nil	49.8	Nil	31.0
Hard board	...	Nil	Nil	12,000 tons	12,000 tons	19.2	Nil	19.2	Nil	19.2	Nil	10.5
Sub-total	1	...	86.2	...	...	184.0	Nil	184.0	Nil	184.0	Nil	123.2

LEATHER & PRODUCTS

Leather tanning ...	54	Upper 17 M. sq. ft. Sole 16 M. lbs.	24.2	8.7 M. Sq. ft. (upper).	25.7 M. sq. ft.	18.0	6.5	24.5	24.5	Nil	13.0
Leather shoes	...	12	15 M. pairs	1.25 M. pairs	16.25 M. pairs	1.5	2.0	3.5	3.5	Nil	1.9
Sub-Total	56	...	44.2	(5)	...	19.5	8.5	28.0	28.0	Nil	14.9

RUBBER PRODUCTS

Cycle tyres and cycle tubes	(6) (12)	1.0 M. units 2.0 M. units	4.7	Nil	Nil	Nil	1.2	1.2	1.2	Nil	0.6
Motor tyres and motor tubes	(7) (2)	7,000 tyres	2.2	0.10 M. units 0.12 M. units	0.10 M. units 0.12 M. units	2.2	Nil	2.2	2.2	Nil	1.5
Rubber soled canvas shoes	(6) (6)	9.0 M. pairs	3.5	Nil	9.0 M. pairs	Nil	1.0	1.0	1.0	Nil	0.4
Other rubber products	23	1,275 tons	1.5	Nil	1,275 tons	Nil	Nil	Nil	Nil	Nil	Nil
Sub-Total	23	...	11.9	...	...	2.2	2.2	4.4	4.4	Nil	2.5

(1) This is for the production of copra, and also for the addition of refining equipment to the existing units.

(2) Includes Rs. 4.9 M for the utilization of sugar Beet when sugar-cane is not available.

(3) These are the looms on hand in the country. Many are not yet installed.

(4) Although Rs. 26.2 M. have been invested, the two Plants involved were not yet operative by June 30, 1955, hence the capacity is shown as Nil. This is true also of motor tyres and tubes, Fertilizers, Iron and Steel.

(5) This includes investment in rubber shoe manufacturing capacity in those factories which produce both leather and rubber shoes (e.g. Bata Shoe Co. Ltd., Lahore).

(6) Included in the 23 factories listed under other rubber products. That is, those factories which produce cycle tubes and rubber shoes also produce other rubber products.

(7) These factories are presently retreading but not producing new tyres. They are included in the 23 factories listed under other rubber products.

(8) These are retread tyres, not new tyres. The investment of col. (4) includes Rs. 0.2 Million in West Pakistan and Rs. 0.5 Million in East Pakistan increasing retreading capacity of motor tyres. These are not included in the units of Col. (5), which are new tyres and tubes.

TABLE I.—contd.

Industrial Capacity June 30, 1955

Planned Capacity Increase (1955-60)

Sector	No. of Factories	Effective annual capacity	Productive capital invested	Increase in effective capacity	Total effective capacity (1960)	Investment in increased capacity	Investment in modernization	Total investment	Private investment	Public investment	Foreign exchange component of total investment
1	2	3	4	5	6	7	8	9	10	11	12
CHEMICAL INDUSTRIES											
<i>Heavy Chemicals</i>											
(a) Sulphuric acid	5	12,330 tons	(1) 1.2	6,000 tons	(2) 18,330 tons	2.5	0.2	2.7	NH	NH	1.5
(b) Soda ash & caustic Soda	1	25,000 tons	16.2	72,000 tons	97,000 tons	38.5	NH	38.5	38.5	NH	30.0
(c) Caustic soda (Elect.)	2	6,000 tons	(4) 2.6	3,000 tons	9,000 tons	3.5	NH	3.5	NH	3.5	2.5
Fertilizers	NH	NH	55.5	386,200 tons	386,200 tons	332.0	NH	332.0	NH	332.0	245.0
Pharmaceuticals and fine chemicals	56	Rs. 8.0 M	9.5	Rs. 21.0 M	Rs. 29.0 M	20.4	2.0	22.4	12.0	10.4	13.3
Anti-biotics (Penicillin & Streptomycin & others)	NH	NH	NH	8.0 M Meg. U(P) 6.0 M Meg. U(S)	8.0 M Meg. U(P) 6.0 M Meg. U(S)	24.1	NH	24.1	NH	24.1	15.7
Dyes	NH	NH	NH	1,310 tons	1,310 tons	11.9	NH	11.9	1.6	9.6	7.7
Paints and varnishes	18	36,000 tons	10.0	16,000 tons	52,000 tons	5.0	1.9	6.9	6.9	NH	4.7
Matches	19	12.2 M Gross	17.0	NH	12.2 M Gross	NH	1.8	1.8	1.8	NH	1.0
Soap	6	25,000 tons	21.0	1,500 tons	26,500 tons	1.5	2.9	4.4	4.4	NH	2.3
Rayon and cellophane	NH	NH	NH	5,400 tons	5,400 tons	70.2	NH	70.2	70.2	NH	45.0
Turpentine & resins	1	Rs. 0.9 M	0.6	Rs. 1.8 M	Rs. 2.7 M	1.6	NH	1.6	0.6	1.0	0.4
D. D. T.	1	700 tons	3.5	700 tons	1,400 tons	4.3	NH	4.3	NH	4.3	2.5
Sub-total	109		137.1			504.7	8.8	523.5	138.6	384.9	371.6
LIQUID FUELS											
Petroleum refining	1	65 M Gal.	28.6	NH	65 M Gal.	13.5	3.6	17.1	17.1	NH	10.9
Power alcohol	NH	NH	NH	1.5 M Gal.	1.5 M Gal.	6.0	NH	6.0	4.0	2.0	4.5
Sub-Total	1		28.6			19.5	3.6	23.1	21.1	2.0	15.4

NON-METALLIC MINERAL PRODUCTS :

Structural clay products ...	4	2,80,000 tons	8.0	30,000 tons	3,10,000 tons	8.5	1.2	9.7	9.7	Nil	5.0
Glass :											
(a) Hollow-ware ...	11	20,000 tons	4.9	18,000 tons	38,000 tons	10.0	3.8	13.8	13.8	Nil	8.0
(b) Sheet ...	Nil	Nil	Nil	28 M Sq. Ft.	28 M Sq. Ft.	10.0	Nil	10.0	10.0	Nil	5.3
(c) Scientific ...	Nil	Nil	Nil	2,000 tons	2,000 tons	Nil	Nil	Nil	Nil	Nil	Nil
Cement ...	5	0.67 M tons	65.7	0.61 M tons	1.28 M tons	79.4	12.5	91.9	37.5	54.4	53.5
Cement products ...	13	Rs. 5.0 M	5.0	Rs. 6.2 M	Rs. 11.2 M	8.5	1.2	9.7	9.1	0.6	4.7
Ceramics and refractories ...	6	2,000 tons ceramics ; 22,000 tons Refractories	6.8	1,600 tons ceramics	3,600 tons ceramics ; 22,000 tons Refractories	4.5	1.6	6.1	6.1	Nil	3.0
Sub-total ..	39	90.4	120.9	20.3	141.2	86.8	55.0	79.5			

ENGINEERING INDUSTRIES :

Iron and steel ...	Nil	Nil	5.0	69,000 tons Billets.	Under construction.	30.0	Nil	30.0	Nil	30.0	20.0
Steel melting ...	2	19,000 tons	2.6	25,000 tons	44,000 tons	3.0	Nil	3.0	3.0	Nil	1.5
Steel re-rolling ...	34	125,000 tons	17.9	62,500 tons	187,500 tons	109.5	4.3	113.8	13.8	100	74.3
Shipyards ...	12	Rs. 30 M	35.3	Rs.97.2 M	Rs. 127.2 M	109.5	6.1	115.6	6.1	109.5	76.0
Medium and light engineering	352	Rs. 130 M	104.0	Rs.46.0 M	Rs. 167.0 M	46.8	19.7	66.5	66.5	Nil	40.0
Non-ferrous products including foundries.	109	Rs. 40 M	14.0	Rs.29.0 M	Rs. 69.0 M	11.9	6.1	18.0	18.0	Nil	9.0
Enamel-ware ...	8	1,400 tons	3.0	Nil	1,400 tons	Nil	Nil	Nil	Nil	Nil	Nil
Sub-Total ...	517	181.8	310.7	36.2	346.9	107.4	239.5	220.8			

ELECTRICAL INDUSTRIES :

Motors, switch gear, and fans.	19	Rs. 9.4 M	12.0	Rs. 18.0 M	Rs. 27.4 M	14.5	1.5	16.0	16.0	Nil	10.6
Cables, batteries, and appliances.	6	Rs.17.0 M	11.5	Rs. 29.8 M	Rs. 46.8 M	17.0	0.4	17.4	17.4	Nil	10.4
Radios and rediffusion ...	7	30,000 radios	4.0	35,000 radios ; 30,000 relay speakers	75,000 radios ; 30,000 relay speakers	4.8	0.3	5.1	5.1	Nil	3.1
Sub-Total ...	32	27.5	36.3	2.2	38.5	38.5	Nil	24.1			

- (1) This does not include the investment in the Sulphuric Acid Plants at the Karnaphuli Paper Mill or Lyallpur Superphosphate Plant, since these are already included in the investment in the respective parent Plants. The capacity of these Plants, is, however, included under Column (3).
- (2) This is free Sulphuric Acid for the market and does not include the Sulphuric Acid to be produced at the Rayon Plant for its own use.
- (3) Soda Ash investment also includes the production of 17,000 tons of Caustic. Soda from Soda Ash and therefore, no investment or capacity is shown under (c).
- (4) This is the investment in the Nowshera Plant only. Investment in Karnaphuli is included with the Paper Plant, investment of Rs. 3.5 million is in East Pakistan by Electrolytic Process.
- (5) This Rs. 1.0 million consists of Rs. 0.5 million from P.I.D.C. and Rs. 0.5 million from the Government of West Pakistan.
- (6) This is the investment required to convert the present distillery to power alcohol and also for new Plants in West Pakistan.
- (7) Scientific glass will be produced in the same Plant that produces hollow-ware.
- (8) Includes iron foundries, but not steel melting, casting, or re-rolling.

TABLE 1.—*contd.*

Planned Capacity Increase (1955-60)

Industrial Capacity June 30, 1955

Sector	2	3	4	5	6	7	8	9	10	11	12	Planned Capacity Increase (1955-60)	
												(Rs. M)	(Rs. M)
	No. of Factories	Effective annual capacity	Productive capital invested	Increase in effective capacity	Total effective capacity (1960)	Investment in increased capacity	Investment in modernization	Total investment	Private investment	Public investment	Foreign exchange component of total investment	(Rs. M)	(Rs. M)
NATURAL GAS													
Transmission	84.0	...	...	214.0	Nil	214.0	54.0	160.0	144.0		
Distribution	Nil	...	...	54.0	Nil	54.0	36.0	18.0	31.7		
Sub-total	84.0	...	...	268.0	Nil	268.0	90.0	178.0	175.7		
OTHER INDUSTRIES													
Printing & publishing	...	133 Rs. 27 M	38.9	Rs. 5.4 M	Rs. 32.4 M	8.4	11.0	19.4	18.3	1.1	10.0		
Film industry	...	6	15 Films	4.0	17 Films	8.6	3.0	11.6	11.6	Nil	6.4		
Misc. industries not listed(1)	...	315	150.0	...	...	130.0	25.0	155.0	155.0	Nil	93.0		
Unforceable Private Investment in new industries.	75.0	Nil	75.0	75.0	Nil	35.0		
Sub-total	...	454	192.9	...	...	222.0	39.0	261.0	259.9	1.1	144.4		
Total Industries	...	3035	2261.8	...	...	2696.3	304.4	3000.7	1616.5	1384.2	1873.0		
Industrial trading estates and facilities.	7.4	...	7.4	Nil	7.4	1.5		
NATIONAL PRODUCTIVITY CENTRE	1.6	...	1.6	Nil	1.6	Nil		
Grand Total Large Scale Industry Investment	...	3035	2261.8	...	...	2705.3	304.4	3009.7	1616.5	1393.2	1874.5		

(1) Includes such industries as bakery goods, dairy products, beverages, breweries, plastic products, sports goods, surgical instruments, musical instruments, pencils, paper products, bone crushing, oxygen and acetylene, cosmetics, etc., except where no power is employed, in which case they are included under Small-Scale Industry.

TABLE 2

Public Investment in Large-Scale Industry, April 1955—March 1960 Through P.I.D.C. Unless otherwise Noted

(Million rupees)

Industry	Total Investment	Private Investment	Public Investment	East Pakistan	West Pakistan	Karachi
Sugar ...	283·3	100·9	182·4	176·4	6·0	...
Woollen textiles ...	2·3	...	2·3	...	2·3	...
Jute goods ...	200·0	50·0	150·0	150·0	...	...
Newsprint ...	115·0	...	115·0	115·0	...	...
Card & strawboard ...	49·8	...	49·8	46·0	3·8	...
Hardboard ...	19·2	...	19·2	19·2	...	...
Caustic Soda ...	3·5	...	3·5	3·5	...	...
Fertilisers ...	332·0	...	332·0	180·0	152·0	...
Animal feed ...	5·0	...	5·0	...	5·0	...
Pharmaceuticals & fine chemicals ...	10·4	...	10·4	10·0	0·4	...
Penicillin & streptomycin ...	24·1	...	24·1	15·0	9·1	...
Dyes ...	11·1	1·5	9·6	5·2	4·4	...
Rosin & turpentine ...	1·6	0·6	1·0	...	1·0	...
D.D.T. ...	4·3	...	4·3	4·3	...	...
Power alcohol ...	6·0	4·0	2·0	...	2·0	...
Cement ...	54·4	...	54·4	...	54·4	...
Asbestos cement sheets ...	2·0	1·4	0·6	...	0·6	...
Iron & steel & re-rolling ...	130·0	...	130·0	100·0	30·0	...
Shipyards ...	109·5	...	109·5	27·4	...	82·1
Gas transmission ...	214·0	54·0	160·0	54·0	106·0	...
Gas distribution ...	54·0	36·0	18·0	...	8·0	10·0
Productivity Centre ...	1·6	...	1·6	0·8	0·8	...
Industrial Trading Estates ...	7·4	...	7·4	4·0	3·4	...
	1,639·5	248·4	1,392·1	910·8 ⁽⁴⁾	389·2	92·1

(1) Of Public Investment, Rs. 0·5 million is by P.I.D.C. and Rs. 0·5 million by Provincial Government.

(2) Scheme under jurisdiction of Ministry of Industries.

(3) Schemes to be financed by Provincial Governments.

(4) Includes partial allocations from reserve of 1,000 million for East Pakistan.

LARGE-SCALE INDUSTRY CLASSIFICATION

1. **Agricultural Processing :**
 - Cotton ginning
 - Jute baling
 - Tea manufacturing
2. **Milling :**
 - Wheat
 - Rice
3. **Food Products Industries :**
 - Edible vegetable oils
 - Vegetable ghee
 - Food processing
 - Sugar
 - Cigarettes
 - Animal Feed
4. **Textile and Clothing :**
 - Cotton
 - Woollen
 - Jute
 - Silk and art silk
 - Hosiery and knitted goods
 - Apparel
5. **Wood Products :**
 - Saw milling
 - Woodware (mostly furniture)
 - Plywood and tea chests
6. **Paper :**
 - Printing, writing and wrapping paper
 - Newsprint
 - Card and strawboard
 - Hardboard
7. **Leather and Products :**
 - Leather tanning
 - Leather shoes
8. **Rubber Products :**
 - Cycle tyres and tubes
 - Motor tyres and tubes
 - Rubber-sole canvas shoes
 - Other rubber products
9. **Chemical Industries :**
 - Sulphuric acid
 - Soda ash
 - Caustic soda
 - Fertilisers
 - Pharmaceuticals and fine chemicals
 - Anti-biotics
 - (Penicillin, streptomycin etc. etc.)
 - Dyes
 - Paints and varnishes
 - Matches
 - Soap
 - Rayon and cellophane
 - Turpentine and rosin
 - D.D.T.
10. **Liquid Fuels :**
 - Petroleum refining
 - Power alcohol
11. **Non-Metallic Mineral Products :**
 - Structural clay products
 - Glass
 - Hollow-ware
 - Sheet
 - Scientific
 - Cement
 - Cement products
 - Ceramics and refractories
12. **Engineering Industries :**
 - Iron and steel
 - Steel melting
 - Steel re-rolling
 - Shipyards
 - Medium and light engineering
 - Non-ferrous products
 - Enamelware
13. **Electrical Industries :**
 - Motors, switch gear and fans
 - Cables, batteries, and appliances
 - Radios and rediffusion
14. **Natural Gas :**
 - Transmission
 - Distribution
15. **Other Industries :**
 - Printing and publishing
 - Film industry
 - Industrial trading estates..

AGRICULTURAL PROCESSING

Cotton ginning

18. The value of the cotton crop depends, in addition to the grade and type of cotton, to a considerable extent on the quality of the ginning. Careless ginning, mixing, and dirtying of the cotton, can reduce the export value appreciably. At present the quality of ginning is not good for three main reasons : carelessness, poor equipment, and intentional adulteration. Insufficient attention seems to be given to the quality of work done. Seeds are chipped and pressed into the cotton, dirt is allowed to remain in, and the fibres are cut and torn recklessly. Although the equipment in use leaves much to be desired, it is possible to do a much better job with this equipment than is now being done.

19. Most of the cotton gins are antiquated roller gins of a type discarded by other cotton-producing countries. There is nothing inherently inferior in the roller gin ; its rate of output is considerably lower than that of the saw gin, but it has the redeeming feature of treating the fibres more gently. The decision as to whether new ginning equipment should be roller gins or saw gins should perhaps await the outcome of the experiments being conducted by the PIDC on its new model saw gins, but it should be made in time to install the new equipment during the Plan period.

20. Very useful surveys of the industry have recently been carried out by different experts. All agree that one of the chief obstacles to the improvement of ginning establishments has been the evacuee property regulations by which evacuee-owned gins (of which there are a large number) are taken over by the Government and leased annually to operations. This destroys all incentive for improvement of the equipment. Some way must be found quickly for disposing of these gins to private owners, or also leases should be granted for a minimum period of five years.

21. Intentional mixing of desi cotton with longer fibre types is still going on in the gins to an alarming extent in spite of all Government regulations to the contrary. Evidently additional enforcement is necessary and it is recommended that Government should employ and train enough inspectors to cover the industry adequately. These inspectors could instruct ginning factory operators in better methods and help to introduce improvements resulting from experiments at the model ginning factories now being set up. Under no circumstances should Government regulations be altered to allow the blending of cotton in the gins. This would inevitably lead to even further adulteration.

22. There were a total of 807 factories in operation during the 1954-55 season. Some 450 of these are small establishments having only one or two roller gins. As a matter of convenience, however, all are classified under large-scale industry and included in Table 1. An estimated Rs. 134.4 million is invested in these factories and their capacity is known to exceed 2.0 million bales per annum.

23. Only a small ginning capacity increase is deemed necessary in the Plan period. Rather what is needed is a complete overhaul of the present capacity with the introduction of pre-cleaning equipment conveying and bulk handling equipment, complete new gins, new rollers and saws and miscellaneous machine parts. No less than Rs. 68.0 million is required for this modernisation programme by 1960.

24. There is need for some new gins to service land being newly brought under cotton cultivation, primarily near the barrages in Sind and the Thal. Also, a few new gins are required for some isolated areas where they are not now located within a reasonable distance of the cotton fields. An estimated Rs. 16.2 million will be required to establish about 20 new mills, bringing the total investment in the Plan period to Rs. 84.2 million. Of this the equivalent of Rs. 46.4 million will be in foreign currencies.

Jute baling

25. Since partition the number of jute presses in the country has increased from 32 in 1947, with a baling capacity of about 2.7 million bales per year, to 78 in mid-1955 with a capacity of about 7 million bales. The total fixed and working capital now invested in this industry is estimated at Rs. 87.6 million. Four new presses are proposed for installation in the border area of East Pakistan at a cost of Rs. 4.0 million. Some modernization, estimated to cost Rs. 2.0 million, will also be necessary.

Tea manufacturing

26. Tea, which is cultivated in the hilly districts of Sylhet, Chittagong and Tipperah in East Pakistan, is one of the important cash crops of the country. Over the past six seasons, from 1950 to 1955, the tea crop has averaged about 53.7 million pounds per season. The production for individual seasons has varied from 55.8 million pounds in 1954 to 51 million pounds in 1955. The country's capacity to process tea is estimated at 55 million pounds per season.

27. Export of tea averaged 24 million pounds per year during the trade years 1953-54 and 1954-55 and was sold for an estimated 45 million rupees. The remaining 28 million pounds was consumed locally. Domestic consumption is increasing, a fact which threatens to deprive the country of some foreign exchange earnings. International tea prices are gradually rising, and the market is expanding. It, therefore, seems reasonable for Pakistani attempt to increase its exports of tea.

28. Production in the 1955 season of 51 million pounds was poor, reportedly due to a shortage of fertilisers insecticides, and spare parts necessary to keep the tea manufacturing machinery in working order. The basic capacity of 55 million pounds can, however, be considered as the point of departure for planning purposes. There are about 75,000 acres now planted in tea compared with the limit of 85,000 acres established by the International Tea Agreement. This agreement limits Pakistan's export to 47 million pounds per year, almost twice the amount now being exported.

29. Increasing tea production is a slow process, since it takes a new tea bush 5 to 6 years to become productive. Nevertheless, a start should be made and new bushes laid out now so that substantial increase can be realised eventually. It is not unreasonable to assume, however, that the production of tea can increase to 60 million pounds by 1960 with little or no increased acreage, but merely by more liberal use of fertiliser and better cultural practices in general.

30. We estimate that 6.0 million rupees of new equipment and 4.7 million rupees for modernisation will be required over the Plan period to provide a production capacity of 60 million pounds by 1960. The 5 million pounds increased capacity will have a corresponding value of production of about 12.3 million rupees.

MILLING

Wheat

31. A large part of the wheat crop is milled in stone mills in the villages. The remainder is milled in power-operated iron-roller mills. There were by mid 1955 about 40 such roller mills included in the large-scale sector of industry with a capacity of .921 million tons a year. The area under wheat cultivation has varied from 9.8 to 11.2 million acres between 1948-49 and 1955-56. The average yield for the year 1948-49 to 1955-56 was 3.3 million tons. It is proposed to increase this yield by 0.504 million tons over the Plan period. Of this increase, we estimate that .101 million tons will be milled in large-scale establishments. To handle this extra crop an estimated investment in increased capacity of 6.2 million rupees will be required. An additional 3.6 million rupees will probably be spent in modernising existing mills. The value of the increased production of 0.101 million tons is estimated at 26 million rupees.

Rice

32. As in the case of wheat, a large part of the rice crop is village-milled (husked). This is done either by hand-pounding or by animal-driven mills. In the organised, or large-scale sector of industry, there are about 219 power mills which both de-husk and polish the rice, with a capacity of about 2 million tons per year.

33. There are now about 24 million acres under rice in both East and West Pakistan, with an average yearly yield of about 8.4 million tons. The increase in production during the Plan period is expected to total 594 million tons, partly from new acreage and partly from higher yields. We estimate that about 150 million tons of this additional crops will be milled in large scale establishments. This will require 12 additional mills with a capacity of 12,500 tons each per season. At a cost of 0.5 million rupees each, the new investment would total 6.0 million rupees. Another 2.4 million rupees is recommended for modernisation. The value of the increased production from large-scale mills is estimated at 37.5 million rupees. The Ministry of Food has submitted a scheme for the construction of 10 new rice mills (against the requirement of 12 noted above) at a total cost of 5 million rupees, to be located at strategic places throughout East and West Pakistan. We recommend that the private sector be encouraged to undertake the investment in new rice mills.

FOOD PRODUCTS INDUSTRIES

Edible vegetable oils

34. Table 3 shows the acreage under oil seed crops, the available oilseeds and the potential yield of oil, in recent years.

TABLE 3

Acreage under oil seed crops and production of oilseeds, average 1948-49—1954-55

	Acreage (Thousand acres)	Available (1) oil seeds (Thousand tons)	Oil equivalent (Thousand tons)
Rape & Mustard	1,624	272	95
Sesamum	200	33	12
Coconut	44	55 (2)	9
Cotton	3,205	537	70
Total		897	186

Notes.—(1) After allowing for seed and other uses.

(2) Weight of husked ripe coconuts.

The capacity in 1955 to produce vegetable oil was in excess of available oil seeds and is expected to continue to be so throughout the Plan period, in spite of increases in the cotton crop and expected higher yields of rape and mustard.

35. Much of the vegetable oil is produced in village oil crushers, called kohlus, of which there may be as many as 100,000 in the country. In the organised sector there are 130 mills which are reported to have a total expelling capacity of close to 220,000 tons per year. These crush all of the cotton seeds, and some of most other varieties of seeds. Those which operate on cotton seed only are mostly located in the former Punjab and Karachi.

36. The productive capital invested in these oil mills is estimated at Rs. 105 million, including working stocks. An investment of Rs. 11.0 million in new capacity is expected in the Plan period, but considerable expenditure in modernisation is required to improve the efficiency of the expellers now in use, to add delinting machines, and to provide modern storage facilities for seeds. We estimate that 14 million rupees is required for this purpose. It is especially recommended that mills which do not delint cotton seeds before crushing them should do so, since the linters are quite valuable as a source of cellulose and also increase the absorptive capacity of the cake and decrease oil yields. Provision is also made for the installation of solvent extraction plants in West Pakistan to remove the oil left in cotton seed cakes by conventional expellers.

37. The coconut oil industry of East Pakistan requires special attention. A large part of the coconut crop is now going to waste for lack of an organised gathering and drying industry, while at the same time coconut oil is being imported. The Plan provides 3.5 million rupees for the installation of five copra-drying plants, each with a capacity of 3,000 tons per annum and Rs. 2.5 million to provide refining equipment to some of the existing oil mills. The present crop is thought to be sufficient to supply these plants, if an organised gathering system is devised.

Vegetable ghee

38. In June 1955 the capacity for production of vegetable ghee (also called vanaspati), or hydrogenated vegetable oil, was estimated at 23,000 tons per annum. This is divided among six factories. An estimated 20 million rupees has been invested in these plants. In contrast to a capacity of 23,000 tons, actual production in 1955 was 14,000 tons, and average consumption before partition was estimated at 15,000 tons. With adequate supply and reasonable prices consumption could be expected to increase by 1960 to about the level of present production capacity. What the industry requires during the Plan period is an increased supply of cottonseed oil and tin plate rather than investment in new capacity. About 1960, however, installation of new capacity will probably have to be commenced. Modernisation of existing plant at a cost of about 2.0 million rupees is recommended during the Plan period.

Food processing

39. A large variety of fruits and vegetables are cultivated in Pakistan, but because of inadequate handling facilities and insufficient preserving capacity a considerable part of the crop is wasted. By June 1955 there were 10 processing plants in West Pakistan with a capacity of about 11 million pounds per year (on a two-shift basis during the harvest season). An estimated capital of about Rs. 4.0 million is thought to be invested in these industries. Most of these plants are technologically obsolete. Only two or three have equipment less than ten years old, and in the others the equipment averages over twenty years old.

40. The Government fruit canning factory at Nasarpur has been renovated and some new equipment has been added; it is now being worked by a foreign firm. If the plant is further remodelled and reorganised, production can be expected to increase to 10,000 cans each of fruits, vegetables and meat per day, that is, 30,000 number 2-1/2 tins per day. At this plant in particular, careful consideration should be given to the size of tins used. For army use number 10 tins are said to be superior to number 2-1/2 tins and they save about 15 per cent on tin plate. In addition they have a re-use value. There is no organised processing industry at all in East Pakistan, and consequently large quantities of fruits and vegetables spoil each harvest season.

41. The Plan provides an investment of Rs. 9.7 million, entirely in the private sector. Of this, Rs. 2.7 million is for a pine-apple canning plant in East Pakistan to produce slices, pieces and juice at the rate of about 40,000 tins per day, on a two-shift basis, during the canning season (about four months). Additional fruits or vegetables with different harvest seasons should be sought to make fuller use of this plant. Rs. 1.0 million is recommended for a model preserving plant to can fruit, vegetables and meats somewhere in north-west West Pakistan. This should be a modern continuous process plant with a capacity of 30,000 tins per day for two shifts during the canning season. The increased capacity in these plants would be 47 million pounds per year, bringing the total processing capacity to 58 million pounds. Another Rs. 1.5 million is required for the modernisation of existing plants. In several cases it may be necessary practically to scrap the old plants and start anew.

Sugar

42. Prior to partition there were five sugar factories functioning in East Pakistan and three in West Pakistan, with a total daily crushing capacity of 5,650 tons. Production of sugar from these mills was estimated at 30-35,000 tons per year. Since partition the crushing capacity of Frontier Sugar Mills and the Premier Sugar Mills has been considerably increased and two more sugar factories at Jauharabad and Leia have been added, the former by the PIDC. In mid 1955 the annual production capacity of those 10 mills stood at about 115,000 tons of sugar.

43. Because the country still imports considerable quantities of sugar, the Plan provides for increasing the existing capacity to 235,000 tons per annum. It is expected that the PIDC and the private sector together will undertake to increase sugar-producing capacity by about 120,000 tons per year. This may be accomplished partially by expanding some of the present plants, and partially by adding new plants ; or it may prove, upon further study, to be best to provide all new capacity. This would require the establishment of 8 additional sugar mills. Of these, six are in the public sector, to be constructed by the PIDC. In West Pakistan, the mill at Charsada is now completed. In East Pakistan, a mill is nearing completion at Rangpur, work is being started on two others at Thakurgaon and Diwanganj, and the Plan provides for two more, a total of five. Tentative provision has also been made for the creation of still further capacity in East Pakistan when definite schemes have been prepared. It should be noted that the wisdom of these sugar targets has been questioned ; they are, therefore, being restudied at present time to find out whether targets need to be revised.

44. In the private sector, the Plan provides Rs. 100·9 million to cover the cost of additional capacity in West Pakistan, including facilities for the production of sugar from beet roots during the off season in the mills located in the former North West Frontier Province. It provides another Rs. 12 million for the modernization of existing capacity. In the public sector, the Plan provides Rs. 20·3 million for the completion of the mills at Charsada and Rangpur, for the construction of four additional mills, and for the creation of a number of cane farms, for the propagation of seed and the assurance of cane supply, most of them in conjunction with the new mills. The foreign exchange component of the total investment is estimated at Rs. 144·7 million.

45. We recommend that sugar by-products should be more fully and economically utilised. Molasses which is now being wasted, could be used as a mix in cattle feed, or yeast and power alcohol could be made from it. An investment of Rs. 4 million, and Rs. 2 million in the private and public sectors respectively, have been provided for the production of power alcohol during the Plan period. Bagasse can be used for feed and as a raw material for paper and plastics, and perhaps for rayon and cellophane. Bagasse charcoal and fuel briquettes can provide an additional source of fuel. We wish to emphasise that, although the sugar industry is being developed by the PIDC, this does not mean that private industrialists should be discouraged from going into this line. On the contrary, we hope that the private sector will undertake purely private projects in this field and thereby free the PIDC for other development work.

Cigarettes

46. At partition there were no large-scale cigarette factories in the country. By mid-1955 there were 6 factories in operation, with a total annual capacity of 4,500 million cigarettes. In spite of the prevailing foreign exchange scarcity, cigarettes are still being imported and the pressure of consumer demand keeps the price abnormally high. The use of cigarettes is increasing, and can be expected to continue to increase as the standard of living improves and the population grows. Additional capacity of 5,500 million cigarettes is therefore recommended for the Plan period, bringing the total capacity by 1960 to 10,000 million cigarettes out of which more than 2,000 million will be produced in East Pakistan. Much of the tobacco for making cigarettes is being grown in the country. The tobacco crop in the 1953-54 season was over 200 million pounds but most of this was not of cigarette making quality and was used for making bidis. Schemes are in hand for increasing tobacco acreage, especially Virginia tobacco, during the plan period. The cost of new capacity is estimated at 31 million rupees and the value of the resulting production will be 60 million rupees per year.

Animal feed

47. An allowance of Rs. 5 million has been made in the Plan for the construction of a plant to manufacture animal and poultry feeds from indigenous materials. It is assumed that Rs. 3·5 million of this amount will be required in foreign exchange. The allowance is shown in the public sector. It should be moved to the private sector, however, if private investors can be interested in the project.

TEXTILE AND CLOTHING

Cotton textile industry

48. For no sector of industry can progress since independence compare with that of cotton textiles. In seven years, the country turned about from a position of almost complete dependence upon imported cotton cloth and yarn to a point close to self-sufficiency. At the beginning of Plan period except for the finer qualities of yarn and cloth, there was sufficient capacity to satisfy the effective home demand. This was brought about by the Government's policy of restricting import and simultaneously granting foreign exchange for the purchase of textile machinery. The result was a rush to set up spindles and looms. Prices were high and quality poor. Fortunes were made in spite of indifferent management, low productivity, and inadequate technical personnel. In 1955 the situation approached a turning point. With increased production, competition began to set in. Prices began to fall to more reasonable levels and profit margins to shrink. The time had come for a less headlong rate of expansion, for paying more attention to considerations of costs and efficiency, for improving existing plant, and for making longer range plans for the future.

49. Whatever the difficulties Pakistan might experience in establishing itself in the cotton cloth export market, there is no doubt that large volume exporting should be set as the goal of the textile industry, rather than aiming at more self-sufficiency. There are many reasons why the country should participate in the world trade in cotton textiles and establish solid export markets. Among them are :

- (a) In the long run foreign exchange earnings would be considerably increased.
- (b) It would diversify the source of foreign exchange earnings, making the country less dependent upon the raw materials markets. Also, buyers of raw cotton are usually not buyers of cotton cloth. Thus, the number of countries upon which Pakistan depends as customers would be increased.
- (c) It would provide incentives for efficiency, contribute to general industrial development, and assure economic production of cloth for home consumption.
- (d) It would provide increased employment.

A strenuous, concerted effort should be commenced at once to find export markets for yarn and cloth.

50. Table 4 shows the development of spindle and loom capacity since independence. As home production of yarn and cloth has increased, imports have correspondingly decreased. By the end of 1954 imports consisted almost entirely of finer yarn and cloth. The country was close to being self-sufficient in coarse and medium cloth.

TABLE 4

Progress in the installation of spindles and looms

Year	Capacity at end of year		Production		Imports		Cloth consumption		
	Spindles	Looms	Cloth bales (1500 yards)	Surplus yarn bales (400 lbs.)	Cloth bales (1500 yards)	Yarn bales (400 lbs.)	Total (million yards)	Per capita (yards)	
1947	177,418	4,824	74,000	<i>Nil</i>	N.A.	N.A.	N.A.
1948	177,418	4,824	58,705	15,506	97,044	74,650	377.9
1949	235,618	5,330	61,632	23,150	179,153	178,865	684.4
1950	290,280	5,330	70,443	37,192	254,953	185,098	843.8
1951	333,126	5,904	85,112	48,037	245,169	201,400	894.4
1952	630,368	9,318	118,209	56,040	233,831	155,000	865.7
1953	792,898	11,911	167,751	133,674	10,144	66,200	586.7
1954	1,316,312	18,421	231,906	251,125	66,073	62,500	937.2
1955	1,683,000	26,000	302,158	384,170	19,955	8,711	1095.3

Source : Office of the Textile Commissioner ; Central Statistical Office ; Textile Industry Year book, 1955.

51. The most important assumption in establishing the desirable expansion of the cotton textile mill industry is the probable local consumption of cloth in 1960. We have taken this figure at 14 yards per head of total population. In deriving this figure, consideration was given not only to the consumption pattern of recent years, but also to the relationship between future cloth prices and purchasing power. The per capita consumption of cloth in 1955 was about 13·4 yards. Consumption during the period of the open general licence was about 11·5 yards. These figures include imported, mill-made, and hand-woven cloth. Considering the slight increase in living standards projected for the next few years, we consider this forecast to be realistic. India's per capita consumption of cotton cloth was only slightly higher in 1952 than in 1943 and, in fact, averaged 13·5 yards over the last thirteen years for which data are available. Considering the ready availability of cloth in India during this period, we are not inclined to predict a higher consumption in Pakistan than 14 yards by 1960. In 1960 the population anticipated should be 88·2 million, so that estimated total cloth consumption (at 14 yards per head) should be 1,235 million yards.

52. The next important fact is the anticipated output of the handloom industry ; this is difficult to estimate. In the past two years there has been a marked decrease in the price of cloth due to the rapid increase in the supply available. This means that handloom weavers are now facing much more serious competition from the mills and many are reported to have been forced out of business. However, at the recent conference on industries at Dacca (December, 1956) it was decided to give handloom weavers more protection (including restriction on types of cloth woven in the mills) as from March, 1957, and various authorities consulted seem to feel there may not be any large change in the output of handloom cloth. This output was estimated at 466 million yards in 1955, and is anticipated at between 500 and 525 million yards in 1956. We have, therefore, assumed that handloom output in 1960 will be approximately 500 million yards. This leaves 1,235 minus 500, or 735 million yards to be woven on mill looms.

53. The next factor is the anticipated export of cloth (and yarn). Since devaluation, exports of both cloth and yarn have been increasing rapidly. Exports over the latter part of 1956 were running at the annual rate of approximately 35 million yards of cloth, and 45 million lbs. of yarn. Quality in the past from many mills (particularly of cloth) has left much to be desired, but this is rapidly being improved (as competition becomes keener). Cloth exports are increasing much faster than yarn exports, and it seems reasonable to expect that mill-made cloth exports should be at least 130 million yards in 1960. This will require a total mill production of 735 plus 130, or 865 million yards.

54. The next factor is productivity, or yards per loom year. This is based on 2-1/2 shift working at an average productivity of 30 yards per loom shift. With 750 shifts worked during the year, this gives an average yield of 22,500 yards per loom year. There have been some objections to our anticipation of 2-1/2 shift working, but we wish to emphasise its advantages. We know many mills which successfully work three shifts with no undue difficulties. Working an average of 2-1/2 shifts instead of 2 should reduce manufacturing costs by approximately 10 per cent ; this reduction is most desirable and may well be a critical factor in breaking into export markets.

55. A production of 865 million yards at 22,500 yards per loom would require 38,444 looms. This is close to the 38,695 looms already sanctioned by Government, and we have accepted the latter figure. 38,695 looms should yield 870 million yards of cloth, and allow exports of 135 million yards.

56. We can now calculate the quantity of yarn required as follows :—

	Million lbs.
Yarn for handlooms (500 million yards at 4·5 yards per lb.) ...	110
Yarn for mill looms (870 million yards at 4 yards per lb.) ...	218
Yarn for other uses (e.g., hosiery, ropes)	36
Yarn for export	45
Total ...	409

Yarn for other uses appears to have averaged about 10 per cent. of the total domestic consumption in the past and we have assumed 10 per cent for 1960. The volume of exports will depend upon improvement in quality and reduction in local manufacturing cost, and could easily be more than 45 million lbs. However, there is a special factor here in that local manufacture enjoys the indirect protection of a heavy export duty on raw cotton (at present Rs. 115 per bale). This has the effect of depressing local prices of cotton, and puts the local mills into a strong competitive position in the export market. However, as internal consumption increases Government is losing more revenue on cotton which is not exported (at present this loss is over 10 crores per year) and it is doubtful whether this indirect subsidy can be continued at its present level.

57. We anticipate a productivity in spinning of approximately 4 oz. per spindle shift, and this means over 750 shifts (2-1/2 shift working) 188 lbs. per spindle year. To produce 409 million lbs. of yarn per year at 188 lb. per spindle shift would require 2,176,000 spindles. A working party which considered this question in October and November, 1956 recommended that the target should be set at the original 2,182,000 spindles already allocated, plus an additional 150,000 spindles for East Pakistan (for spinning fine and superfine yarn.) This would make the total target 2,332,000 spindles. However, in view of the difficulties some mills are at present experiencing in selling all their yarn, it was recommended that expansion worth Rs. 50 million should be deferred until after the Plan period. This would correspond to approximately 130,000 spindles, and would reduce the target in 1960 to approximately 2,200,000 spindles. This is close to the 2,176,000 spindles estimated above, and we accept 2,200,000 spindles as the Plan target.

58. In arriving at the above capacity estimates, we have tried to consider all the important factors involved. Two of these factors should be mentioned here. These are the efficiency of the industry, and the fineness of cloth and yarn. The efficiency of some mills compares very favourably with mills anywhere, but on average efficiency could be increased considerably. The I.L.O. Productivity Mission (which has been working in the textile industry here since April 1955) has demonstrated increases in productivity ranging from 10 per cent to 50 per cent over complete mills. These increases have been achieved in short periods of little over a month by introducing modern management techniques, by training management (particularly supervisors), by demonstrating the value of establishing (by elementary work study) and using standards of performance, and by setting up controls to focus attention on waste of resources (men, machine, and material). The Government has now agreed to set up an Industrial Productivity Centre to extend its work to all industries, but in the meantime, mill owners should do much more to extend the application of these management techniques. In particular we feel that an immediate start should be made in all mills on the formal training of supervisors and apprentices and we hope that both millowners and Government will expedite the setting up of textile institutes in various parts of the country.

59. The fineness of cloth and yarn has a marked effect on productivity. An increase in the fineness from 20 count to 21 count will decrease spinning productivity in ozs. per spindle shift by approximately 8 per cent. Hitherto, all the yarn spun in the country has been of coarse and medium counts (defined as below 36's). Fine and superfine yarns, and cloth woven from them, continue to be imported. It is estimated that the market for fine cloth is about 15 per cent of the total cotton cloth market, and there is no reason why the country should not be self-sufficient in finer yarns as well as in coarse and medium yarn. We strongly urge that all spindles to be imported in the Plan period should be capable of spinning yarn of counts finer than 36's. Allied with the spinning of finer yarn is the installation of combing equipment. We estimate that it will be necessary to use combers in preparation for spinning yarn finer than 40's from indigenous cotton, and finer than 50's from imported cotton. On this basis, the installation of combing and additional preparatory equipment to service 250,000 spindles is recommended, and Rs. 15 million have been provided in the Plan for this equipment.

60. To spin yarn finer than 50's count, long-fibre imported cotton must be used. It seems to be economically sound to import cotton to spin finer yarns rather than to import the yarn. Another factor to be considered is that experiments in growing Egyptian cotton in Sind are being conducted, and it may be that Pakistan will eventually have its own long-fibre cotton. We anticipate that the average fineness of cloth and yarn will

						Quantity (Thousand lbs.)
<i>Worsted</i>						
Military (socks, shirts, etc.)	...	...	...	...	...	2,150
Civilian	...	...	...	...	...	1,250
Total						3,400

Not more than 24,000 woollen spindles, working two shifts, can provide the 10·3 million lbs. of wool yarn required, and 23,000 worsted spindles, also working two shifts, can produce the 3·4 million lbs. of worsted yarn required. Thus, the Government's sanction seems to be in excess of needs to the extent of 3,040 woollen spindles and 3,250 worsted spindles. The recommended programme of expansion is for an additional 11,000 woollen spindles and 5,250 worsted spindles.

65. As opportunities arise to reduce the sanctions given, we suggest that the Government should take advantage of the chance to do so. There seems to be no particular reason why this industry, especially the worsted section, should be allowed to produce in excess of the country's immediate needs. We estimate that about Rs. 20 million annually worth of imported wool tops would be required to employ, on a two-shift basis, the 26,250 worsted spindles sanctioned. This is a foreign exchange drain that should be avoided to the maximum extent possible.

66. The P.I.D.C. has built two woollen mills, at Harnai and Bannu, each having 2,340 woollen spindles. These cost Rs. 10 million in total and are now in operation. Another woollen mill, at Quaidabad in the Thal area, with capacity of 1,000 woollen spindles, has just been completed. This mill was built jointly by the P.I.D.C. and the Thal Development Authority. It costs an estimated Rs. 2·5 million. The additional 16,250 spindles included in the Plan will cost about Rs. 14·0 million, including the cost of completing Quaidabad. Another Rs. 6·4 million is included for modernizing existing mills, bringing the total investment to Rs. 20·4 million, of which the equivalent of Rs. 13·3 million, will be in foreign exchange.

Jute goods

67. At independence there were no jute looms in the territory that became Pakistan and very few baling presses, far less than was required to bale the normal jute crop. The PIDC was given responsibility for developing the jute manufacturing industry and, with the aid of private industrialists, had purchased 7,000 looms, by March, 1955, which have been installed and are operating, mostly on a two-shift basis. More looms are to be ordered to achieve the target.

68. Following currency revaluation, the situation improved rapidly. Stocks melted, installation of looms was speeded up and the industry operated with renewed enthusiasm. The world market for jute goods is generally considered to be stagnant, although some authorities have recently predicted a slow and gradual increase. On the one hand, bulk handling methods and substitutes for jute are shrinking the market. On the other hand, increasing living standards and new uses tend to expand the market. The popularity of jute depends entirely on its cheapness. Substitutes are available and will displace jute the moment it becomes economical to do so. Economic development in India is increasing the consumption of jute. A similar tendency may be found in other developing countries. All things considered, we are inclined to take a cautiously optimistic view.

69. Pakistan has natural advantages in the jute goods industry which ought to be fully exploited. We therefore recommend a bold programme of expansion with the goal of purchasing and installing 5,000 additional looms by 1960, bringing the total of looms installed to 12,000. The recommended expansion programme is shown by years in Table 7. This programme, given the present volume of international trade, would provide

enough capacity for Pakistan to supply over 34 per cent. of the jute goods in international trade by 1960. But this proportion would decrease as the total world trade increases. Larger markets will have to be found and better channels of distribution worked out, so these goods can be sold. Although this may seem a difficult undertaking, the country must exploit all opportunities of earning foreign exchange.

TABLE 7

Jute loom expansion target and export projections, 1955—60

Fiscal year	Looms on hand at end of Fiscal year	Looms operating at end of Fiscal year	Production capacity of operating looms (1) (two shifts) (Thousand tons)	Domestic requirements of Jute Goods (Thousand tons)	Surplus Jute Goods for export (Thousand tons)	Surplus Jute Goods as percentage of international trade (2)	
1	2	3	4	5	6	7	
						%	
1954-55	6,750	3,300	106	43	63	7
1955-56	8,000	5,000	160	46	114	12.6
1956-57	9,000	7,500	240	50	190	21.1
1957-58	10,000	9,500	304	53	251	27.9
1958-59	11,000	10,500	336	57	279	31.0
1959-60	12,000	11,500	368	60	308	34.2

(1) At the rate of 16 tons/looms/shift/yr.

(2) Based on total international trade of 900,000 tons.

70. The planned expansion programme will involve an investment of 200 million rupees. An additional 12 million rupees should perhaps be spent in modernisation, bringing the total investment to 212 million rupees during the Plan period, of which about 145 million will be in foreign currencies. We hope that at least 62 million of this investment, that is, the cost of one-fourth of the additional looms and all the modernising expense, will come from private sources, leaving about 150 million rupees to be invested through the PIDC.

Silk and art silk textiles

71. An average of about 7.0 million pounds of art silk (rayon) yarn, and just a trickle of real silk yarn, have been imported annually since 1951; the figures are given in Table 8 below. The silk weaving industry has depended to date entirely on imported yarn. In 1952 there were about 740 power looms producing an estimated 5.5 million yards of art silk cloth, the remainder of the yarn being woven by handlooms. By June 1955, there were about 4,000 power looms installed and the production of art silk cloth in 1956 was 17.5 million yards. For the past two years imports have not been sufficient fully to employ the power looms installed.

ing the jute manufacturing industry and, with the aid of private industrialists, had purchased 7,000 looms, by March, 1955, which have been installed and are operating, mostly on a two-shift basis. More looms are to be ordered to achieve the target.

68. Following currency revaluation, the situation improved rapidly. Stocks melted, installation of looms was speeded up and the industry operated with renewed enthusiasm. The world market for jute goods is considered to be

	1951		1952		1953		1954		1955		1956	
	Vol.	Value Rs. M.	Vol.	Value Rs. M.	Vol.	Value Rs. M.	Vol.	Value Rs. M.	Vol.	Value Rs. M.	Vol.	Value Rs. M.
Art silk yarn (M. lbs.)	6.84	24.06	10.55	28.35	6.61	13.32	7.10	14.53	8.50	14.93	8.86	21.65
Mixed yarn (M. lbs.)	0.17	0.70	1.28	2.95	0.03	0.06	Nil	Nil	0.08	0.16	0.07	0.17
Silk yarn (M. lbs.) ...	0.02	0.42	0.01	0.14	0.07	0.30	0.01	0.13	0.02	0.09	0.02	0.09
Total ...	7.03	25.18	11.84	31.44	6.71	13.68	7.11	14.66	8.60	15.18	8.95	21.91

Source : Central Statistical Office.

72. Of the estimated 4,000 power looms installed in mid-1955, only 40 to 50 were located in East Pakistan, all in a single factory at Chittagong. We recommend the installation of 600 additional art silk power looms in East Pakistan to meet local requirements for art silk cloth. We have accepted the 400 additional looms for backward areas of West Pakistan, but there has been a doubt about the number of looms already in existence and the matter is under study. The cost of the additional looms is estimated at 6.6 million rupees. Another 1.2 million rupees will perhaps be spent in modernising existing plants, bringing the total expenditure during the Plan period to 7.8 million rupees.

73. The Plan provides for a viscose rayon plant with a capacity of 7.2 million pounds of yarn per year. This plant is discussed later under rayon and cellophane. Although it will not satisfy the entire requirements of the power loom industry, it will go a long way towards alleviating the shortage of art silk yarn.

74. Very little natural silk yarn is being produced in the country ; the total estimated is 50,000 pounds per year, almost all of which is produced in East Pakistan. Imports have also been small, averaging only 16,500 pounds per year over the past three years. This total availability of about 66,500 pounds must be shared with the handlooms.

Hosiery and knitted goods

75. In June 1955 there were 75 knitting factories in the country producing a variety of underwear, stockings and socks, scarves and sweaters, and similar goods from art silk, cotton and woollen yarn. The rayon and some of the finer quality wool and cotton yarns are imported. The industry has operated below capacity for the past two years, because of a shortage of imported materials and replacement parts. The plan provides 13.0 million rupees for expanding some of the existing factories and another 6.7 million for modernisation.

Apparel

76. The apparel, or ready-made garment industry, although started only recently in organised factories, has had a rapid growth. By mid 1955 there were 13 units qualified to register under section 2 (j) of the Factories Act. There are many more apparel factories than this, but most of them do not employ power, and hence are not registerable under section 2 (j). We are of the opinion that there is considerable scope for expansion in this industry, and have therefore provided 6.6 million rupees for 20 new factories. It is essential that these factories should be dispersed throughout the country, and not concentrated in large cities. Another 1.1 million rupees is recommended for modernisation of existing factories.

WOOD PRODUCTS

Saw milling

77. Wood production for the whole of Pakistan was estimated at about 8,50,000 tons in 1954. Of this, about 67 per cent is firewood and 33 per cent timber. A rough estimate of the forest area of Pakistan from which timber is extracted is about 6.6 million acres (3.4 in West Pakistan, and 3.2 in East Pakistan). After deducting the treeless pockets, the actual forests may be estimated at 5 million acres. Saw milling consists of the process of cutting the logs into planks and scantlings of different sizes before the timber becomes of commercial use. Saw mills in Pakistan use power-driven circular saws or endless saw blades. Equipment is simple and the process is easy. It has a quick turn-over and does not require a large investment. In West Pakistan much of the saw milling is done at Jhelum where timber logs are transported down the river from Azad Kashmir. Jhelum is a central timber market, with Mardan as another such town. In East Pakistan, Chittagong and Sylhet are the main places for sawing. By June 1955 there were 14 organised factories employing power, and many smaller units, especially in East Pakistan, where sawing was also done manually. As new saw-milling schemes are included with timber extraction schemes in the chapter on Agriculture no provision is made here for investment in this industry.

Woodware (mostly furniture)

78. Furniture manufacturing has grown rapidly with the growing needs of the people. This trade involves mostly handicraft and manual work, and the artisans in this industry are very skilful. The occupation is largely hereditary and at partition many of the best artisans came to Pakistan. Pakistan produces approximately 14.0 million cubic feet of timber annually, out of which only about 3 million cubic feet is suitable for furniture making. Best quality teak, which is an ideal timber for furniture making, is not found in Pakistan, but a species of inferior quality is found in the Chittagong Hill Tracts, and of that about 18,000 cubic feet is extracted annually. A limited quantity of teak is also imported from Burma and Malaya. In view of the present shortage of teak, other local timbers are now utilised for furniture making, especially shisham, deodar, kail, chapalish, chikrasi, and passur. Furniture making is mostly done on a cottage industry basis. There are, however, about 11 organised factories and workshops fitted with modern wood-working machinery. Because we think this sufficient to meet the needs for the Plan period, no new capacity is recommended before 1960.

79. The Plan provides Rs. 0.6 million for modernisation of the existing industry and none for increasing capacity. The manufacture of shuttles and bobbins and other industrial woodware is covered by the small-scale and cottage industry programme.

Plywood and tea chests

80. The manufacture of plywood has been started in two factories, one in Karachi and the other in Lahore. Another is being set up in Chittagong. Production from the existing factories is inadequate to meet requirements, even for the manufacture of tea chests alone. The tea crop of 55-60 million pounds forecast for the Plan period will require 5,600,000 tea chests, using about 10 million square feet of plywood for construction. Most of these chests are now being imported. The capacity of the two factories operating in June 1955 totaled about 4.5 million square feet, and another 0.5 million square feet was produced in small shops, which brought the total production to about 5.0 million square feet.

81. The Plan provides 1.2 million rupees for completing the establishment of the Chittagong factory on the understanding that its production of about 4.0 million square feet will be used only for making tea chests. Another 0.4 million rupees is provided for modernising the existing factories.

PAPER

82. At the time of partition no paper was made in the country except in a few places like Jhelum and Sialkot, which produced some hand-made paper of indifferent quality.

Printing, writing, and wrapping paper

83. A modern paper mill based on bamboo pulp was recently established by the PIDC on the Karnaphuli River in East Pakistan at a cost of Rs. 60·0 million. It has a capacity of 30,000 tons per annum of writing, printing, and wrapping paper. The country's requirements of writing, printing, and wrapping paper are at present estimated at 20,000 tons per annum, leaving a surplus for increased consumption or export. Additional capacity for 12,000 tons of mechanical printing paper is included in the newsprint plant discussed below.

Newsprint

84. Newsprint is not now produced in the country. The PIDC has completed investigations and has under construction a newsprint factory in East Pakistan, at Khulna, where soft-wood for mechanical pulp is available in abundant supply from the forests of the Sunderbans. The proposal is to produce 23,000 tons of newsprint and 12,000 tons of mechanical process-printing paper. U. N. experts have already submitted a report on the feasibility of this project, and a private firm has prepared a scheme. The proposed mill is to have two paper machines, one to produce newsprint on a continuous basis, and the other to produce printing paper on a batch basis. The mill will be self-contained in wood preparation, pulp manufacture, paper making and finishing, water supply, steam and electric power, and employee housing. The Plan provides 115·0 million rupees for this plant, out of which a total of 81·7 million rupees is expected to be the foreign exchange component. The estimated value of the product is 38·7 million rupees per year. There should be considerable surplus from this plant for export.

Card and straw-board

85. Straw-board and card board are the basic packaging materials of most industries. Pakistan possesses large quantities of fibrous raw materials in the form of wild grasses and wheat and rice straws which are quite suitable for the card and straw-board industry. The country has been until now dependent for its requirements entirely on imports. The PIDC has established a high-grade board factory at Nowshera, which has been designed to manufacture board from grass by the monosulphite process. The installed capacity is 30-32 tons per day, or an average of 7,500 tons per annum. The mill is designed to secure flexibility of production so as to produce both board and paper to suit the market trends. A straw-board mill has been set up at Rahwali in Gujranwala District of the Punjab. It has been designed to produce 30 tons of straw-board and wrapping paper per day, or about 7,500 tons per annum, from rice straw.

86. These mills have together cost Rs. 30·7 million for the production of 15,000 tons of card and straw-board, the value of which is expected to be Rs. 16·9 million. The Plan provides for an additional card and straw-board mill in East Pakistan where raw materials are found in abundance. The plant would cost 46 million rupees, and produce 20,000 tons of card/straw-board per annum, valued at 23·1 million rupees. This scheme should perhaps be commenced late in the Plan period, after the PIDC has had experienced in the operation of the Rahwali and Nowshera mills.

Hard-board

87. Hard-board is a very good substitute for wooden planks or plywood. It is a product made of paper pulp or fibres, and fillers with a suitable binding material. During the last three years the country has been importing considerable quantities of hard-board. The raw materials for this industry are found in abundance in East Pakistan. The Plan provides for establishing one factory there of 12,000 tons capacity at an estimated

cost of Rs. 19.2 million, out of which the foreign exchange component is estimated to be 10.5 million. The annual value of the product will be 9.6 million rupees. The development programme for the paper industry is summarised in Table 9.

TABLE 9

Present and proposed investment in the paper industry, 1955—60

Plant Location	Product	Total investment (Rs. million)	Investment in Plan period (Rs. million)	Annual capacity	
				Quantity (tons)	Value (Rs. million)
Nowshera (N.W.F.P.) ...	Paper board & high-grade writing paper	18.5	2.0	7,500	9.4
Rahwali (Punjab) ...	Straw-board & wrapping paper	12.2	1.8	7,500	7.5
Chandragona (East Pakis- tan).	Writing, printing & wrap- ping paper	60.0	<i>Nil</i>	30,000	49.1
Proposed at Khulna (East Pakistan).	Newsprint & printing paper	115.0	115.0	35,000	38.7
Proposed in East Pakistan	Hard-board ...	19.2	19.2	12,000	9.6
Proposed in East Pakistan	Card & straw-board ...	46.0	46.0	20,000	23.1
Total ...		270.9	184.0	112,000	137.4

LEATHER AND PRODUCTS

Leather tanning

88. The country had some 54 large-scale tanneries in mid 1955 with an annual capacity of 17 million square feet of upper and 16 million pounds of sole leather, which is more than enough to provide tanned leather for domestic uses, but not enough to tan the hides and skins sold abroad. Pakistan ranks among the largest producers and exporters of hides and skins, the total annual production of which comes to about 15 million pieces. Table 10 shows the supply and consumption of hides and skins for the year 1952-53.

TABLE 10

Net available supply and consumption of hides and skins in Pakistan, 1952-53

(Thousand pieces)

Product	Production	Exports	Imports	Net available supply	Consumption in			Utilized for making and repairs of			
					Modern tanneries	Village tanneries	Raw state	Foot-wear	Agri-cultural goods	Industrial goods	
Hides	...	5,400	2,815	(1) 16	2,601	1,700	876	25	2,393	130	78
				(100·0%)	(65%)	(34%)	(1%)	(92%)	(5%)	(3%)	
(2) Skins	...	9,916	(3) 8,948	(1) 131	1,099	600	477	22	769	110	220
				(100·0%)	(55%)	(43%)	(2%)	(70%)	(10%)	(20%)	
Total	...	15,316	11,763	147	3,700	2,300	1,353	47	3,162	240	298
				(100·0%)	(62%)	(37%)	(1%)	(85%)	(7%)	(8%)	

Source : Marketing of Hides and Skins in Pakistan, Report by Secretariat, U. N. Economic and Social Council November, 1954.

Notes :— (1) Dressed pieces only.

(2) Includes fur and fancy skins.

(3) Includes 1,000 dressed pieces.

Annual production is estimated at 5·4 million hides (kips and buffs), 7·7 million skins (sheep and goat) and 2·2 million furs and fancy skins (included under "Skins" in Table 10). Of this availability, about 77 per cent or 12 million pieces, was exported in 1952-53. Since then the percentage of hides and skins utilised internally has increased somewhat. Also, the ratio of modern to village tanning has increased. But, all things considered the picture has not altered appreciably.

89. Table 10 indicates the potential for expansion of the tanning industry for export. Certain difficulties stand in the way of rapid expansion, however. The quality of Pakistan leather is not good enough to compete easily in the export market, mechanised tanning is new in the country, and much remains to be learned. Also, the quality of hides and skins is frequently poor, a considerable proportion of them being damaged through careless flaying and curing. In addition, the industry must import at present almost all of its chemicals and tanning materials.

90. Nevertheless, a start should be made during the Plan period on the development of this industry for export. The Plan provides for the installation of six modern tanneries, two or more in each Wing, designed for export production of upper leather, and also to serve as model plants for the improvement of quality and the training of management and workers throughout the industry. The cost of these tanneries is estimated at 3 million rupees each. Another 6·5 million rupees is provided for modernising many of the existing plants, bringing the total investment during the Plan period to an estimated 24·5 million rupees.

Leather shoes

91. By mid 1955 there were 12 organised factories which were fully or partially mechanised. One of these factories is quite large, and all but one are in West Pakistan. It is estimated that these factories have an investment of about 20 million rupees in productive capital, and a capacity of 15 million pairs of leather shoes per year. The cottage and small-industry sector turns out about 12 million pairs a year, giving a total capacity of about 27 million pairs. The annual footwear requirements given by various authorities and the representatives of the trade are very conflicting. After reconciling these figures and making an analysis of our own, we estimate the requirement of leather shoes at about 25 million pairs per annum for the Plan period.

92. An investment of Rs. 1.5 million is allowed for a mechanized shoe factory in East Pakistan with a capacity of 1.25 million pairs per year. Another 2 million rupees is allowed for the modernization of existing units.

RUBBER PRODUCTS

93. Unfortunately the rubber products industry now depends entirely on imported rubber. There are reported to be places in East Pakistan where natural rubber can be grown. One report, prepared by a private industrialist, estimated that 40,000 acres of land could produce 6,000 tons of rubber per year within 8 years. Because we understand that large rubber users are predicting a world-wide shortage of natural rubber within the next few years, we recommend that the Government should take action to see that the possibility of cultivating rubber in East Pakistan is thoroughly explored. It may also be practical to produce synthetic rubber from Sui gas, but this possibility should not interfere with the growing of rubber in East Pakistan, since there will probably continue to be a good export market for natural rubber.

The rubber products industry consists mainly of cycle tyres and tubes, rubber-soled canvas and all-rubber shoes, and retreading of automobile tyres. Hose pipes and brake linings, rubber sheets, tubes, matting and sundry other goods are also manufactured.

Cycle tyres and tubes

94. There was practically no rubber industry before partition, and the production of cycle tyres and tubes was non-existent. In June 1955 there were 12 units engaged in the manufacture of cycle tyres and tubes, with a capacity to produce 1 million cycle tyres and 2 million cycle tubes per year. Productive capital of 4.7 million rupees was estimated to have been invested in these units. The Plan provides a sum of 1.2 million rupees for the modernisation of the existing units. Since capacity now exceeds estimated requirements, no investment for increased capacity is provided.

Motor tyres and tubes

95. One Karachi company has already invested Rs. 2.0 million in equipment with capacity to produce 100,000 motor tyres and 120,000 motor tubes per year, and we are providing for additional investment of Rs. 1.4 million. The value of the product of this plant is estimated to be Rs. 12.3 million. By mid 1955 two factories were retreading old tyres, but not producing new ones. They have an estimated capital of 200,000 rupees invested in retreading machinery and the Plan provides another 800,000 rupees for additions to this equipment. The capacity for retreading is expected to increase from 7,000 tyres to 21,000 tyres per year by 1960.

Rubber-soled canvas shoes

96. In June 1955 there were 7 units, 4 in West and 3 in East Pakistan with an annual effective capacity of 9 million pairs, in which a capital of Rs. 3.5 million had been invested. The Plan provides one million rupees for modernisation of the existing units only; no new capacity is considered necessary.

Other rubber products

97. This covers a variety of articles, including household and surgical goods, toys and hose pipes. By mid 1955 there were 23 units, most of which also produce either cycle tyres or rubber shoes. Capital of Rs. 1.5 million had been invested in a capacity to produce 1,275 tons of various articles. As the capacity is surplus to the requirements of the country, and the industry is mainly dependent on imported raw materials, no investment in increased capacity is expected.

CHEMICAL INDUSTRIES

Sulphuric acid

98. Sulphuric acid is an essential raw material in a wide variety of basic industries including fertilisers, chemicals, petroleum refining, paper and rayon. The consumption of sulphuric acid is sometimes used as an index of industrial activity. Its cost is very high in Pakistan today because of the small quantities produced, and limitations on imported sulphur. This may have a constricting effect on the development of using industries. A basic technical-economic study is required to determine the cheapest and best process for making sulphuric acid under local conditions. It is possible that the process of producing sulphuric acid from gypsum in conjunction with cement is economically feasible. These matters should be studied before the increased capacity we recommend is commenced.

99. In June 1955 there were 3 modern units and 2 very old units, with a total annual capacity of 12,330 tons per year. Most of the output of two of the modern units (Lyalpur and Chandragona) is expected to be used on the spot; only 3,000 tons from the one in Karachi, and 330 tons from the old plants at Sukkur and Rawalpindi are available for commercial purposes. The Plan provides for the establishment of two new 3,000-ton plants, one in each Wing, to increase the capacity by another 6,000 tons per annum at an investment cost of 2.5 million rupees. Investment in these plants is expected only towards the end of the Plan period. The total effective capacity will then amount to 18,330 tons per annum. A sum of 200,000 rupees is also provided in the Plan for modernising existing plants.

Soda ash

100. Soda ash is used primarily in the making of glass, and in textile finishing. In June 1955 there was only one soda ash plant in Pakistan. It is located at Khewra in the salt range, and has a rated capacity of 25,000 tons per annum. Its average production is about 24,000 tons. This is not sufficient to meet present requirements because some is being imported, and the market price is very high. Since the investment programme contemplates increased capacity in both glass making and textile finishing, additional quantities of soda ash will have to be made available. The country is well-endowed for the production of soda ash, since the main ingredient is common salt. The Salt Range provides one of the purest deposits of rock salt in the world, and sea salt is produced in abundance in West Pakistan. The continued import of this product is therefore not desirable.

In the following paragraphs on caustic soda, is described the Solvey-process caustic soda plant which it is proposed to commence as soon as possible. This plant will also produce 40,000 tons a year of unconverted soda ash. This, in addition to what is now being produced, is expected to meet requirements for some time.

Caustic soda

101. The principal users of caustic soda in Pakistan today are the soap and paper industries. In June 1955 there were two plants in operation, each of 3,000 tons a year capacity. One is at the Karnaphuli paper mills, which use its entire output, and the other is at Nowshera, where most of its production goes directly to the cardboard plant located there. The country is at present importing 8-9000 tons per year for the soap industry and miscellaneous users.