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THE INDUSTRIAL DEVELOPMENT OF PERU

Summary and conclusions

CONTENTS

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NOTE BY THE SECRETARIAT

In view of the fact that the printed version of The Industrial development of Peru cannot, for technical reasons, be published before the eighth session of the Commission, the secretariat has considered it advisable to distribute the introduction and conclusions of this study separately, in order to give delegations, prior to the session, a general idea of the main problems covered.

PRELIMINARY NOTE

The present study was initiated in response to a request expressly formulated by the Government of Peru and taken up with particular interest by the secretariat of the Economic Commission for Latin America, not only because of the request itself but also because, in carrying it out, the secretariat was complying with several resolutions adopted by ECLA at its various sessions. 1/

At the end of 1956, the Government invited the Executive Secretary of ECLA and other senior officials of the United Nations to investigate, in conjunction with the Peruvian authorities and representatives of private institutions in Peru, the possibilities of obtaining more assistance from the United Nations in analysing the problems of the Peruvian economy, with special reference to industrialization and its prospects. As a result of these conversations, the Government asked ECLA to send a group of specialists in industrial development to Peru. It also applied to the Technical Assistance Administration for the help of several experts in specific aspects of industry to work in close contact with the ECLA Group, and to the United Nations Food and Agriculture Organization for the co-operation of specialists in agricultural problems.

During 1957, several members of the ECLA secretariat staff proceeded to Peru. There they spent as much time as was essential for the fulfilment of their respective assignments. Direct contact was thus established, inter alia, with many leading figures in both the public and private sectors. The group paid visits to a large number of industrial establishments and was thus able to profit from the experience and knowledge of industrialists themselves. The group likewise had access to studies and background information prepared or compiled by various institutions (governmental, para-statal and connected with private enterprises and associations) all these data and opinions were then systematically classified and analysed at the headquarters of the Commission for the

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1/ See in particular resolution 48 (V).

purpose of drafting a provisional draft of the study which was submitted to Peruvian industrialists and other specialists for discussion and comments. Several changes were made in the study on the basis of their opinions and are incorporated in the present version.

From the outset, the secretariat bore in mind two circumstances, by virtue of which the report's possible interest for officials and entrepreneurs in the country immediately concerned could be extended to a wider circle through the inclusion of certain experiences that might be of value to other Latin American countries.

In the first place, the conditions attending Peru's industrial development, at any rate during the last eight years of the period considered, were rather unusual for a Latin American country. As from 1949, Peru's economic policy was characterized by a marked tendency towards the liberalization of foreign trade, accompanied by a highly simplified exchange system, a relatively moderate customs tariff and a very limited use of other forms of import controls and restrictions. It therefore seemed of general interest to analyse the characteristics of industrial growth under these conditions in fuller detail. The second circumstance - admittedly of much more limited interest relates to specific aspects of the methods which the ECLA secretariat has been applying in its studies of the Latin American economies. While most of the earlier country studies 2/ comprised an analysis of the economy as a whole and of each of its main sectors, this time the specific pattern of development of manufacturing industry was to be examined. But the methods so far applied had shown that it was impossible to form a proper impression of the growth and outlook of any given sector in isolation, without reference to over-all problems, and the necessary steps had to be taken to determine what was the minimum additional research that would be required in this particular case, where the main concern was industry.

2/ See the studies on Colombia (E/CN.12/365/Rev.1), Brazil (E/CN.12/364/Rev.1), Bolivia (E/CN.12/430 and Add.1) and Argentina (E/CN.12/429) in the series Analyses and projections of economic development, prepared by the secretariat.

/It was

It was probably this latter aim that gave rise to most of the practical problems encountered in the course of the research. Even when the limitations of the available statistical information on industry - among which special mention must be made of the lack of an industrial census - were successfully overcome by means of indirect methods and estimates, difficulties were created by the serious gaps in the background data to hand on a number of other key aspects of the Peruvian economy. 3/ It is therefore not surprising that much of the time spent on this research had to be devoted to the preparation of purely statistical instruments and data. For the same reason, the present study includes two statistical annexes, detailing the sources and methods utilized for the corresponding estimates, so that these can more easily be revised, corrected and brought up to date by research workers in a position to follow the phenomena concerned more closely.

Many of these difficulties would have been insuperable but for the generous co-operation which the secretariat officials met with in a wide variety of circles in Peru. The Ministry of Finance offered not only material facilities in the shape of offices and secretariat staff, but also the timely assistance and technical advice of its highest-ranking officials. The National Industrial Association (Sociedad Nacional de Industrias) actively collaborated in the whole of the preparatory phase of the study, organized meetings between the secretariat officials and groups of industrialists representing the most important branches of manufacturing activity and facilitated first-hand visits to numerous establishments, in addition to the invaluable direct assistance rendered by its permanent staff. Much of the study is based on the background research on Peru's national income which the Banco Central de Reserva has been systematically carrying out; furthermore, the officials of this

3/ It is sufficient to mention, interalia, the fact that there are no demographic statistics to show urban and rural population trends, nor employment statistics whereby changes in the distribution of the labour course by activities could be traced; the lack of estimates of the evolution of national income in real terms; the want of quantum indices of production in industry and other sectors; the absence of estimates of the stock of capital in the Peruvian economy, etc.

/institution were

institution were always ready to supply additional information, including unpublished material, and generously gave their time to discussing numerous problems with the members of the secretariat group. The preparation of some of the basic statistics utilized in the study was possible thanks to the co-operation of the National Statistical Service (Dirección Nacional de Estadística), especially its Mathematical Statistics and Research Department; the population estimates and quantum indices of industrial production constituting the statistical appendices attached to the present text are the outcome of this collaboration. Aggregate statistics on registered industry are almost exclusively based on the tabulations prepared by the Department of Industry and Electricity of the Ministry of Development, whose officials were always ready to add considerably to such data as are periodically tabulated, in order to provide as complete and detailed a picture as could reasonably be expected from the industrial statistics available for 1955. No less generous was the help afforded by the Banco Industrial del Perú and many other official agencies. The most important part of the study - that dealing strictly with the current situation and prospects of the principal branches of industry - could not have been carried out without the unfailing co-operation of entrepreneurs, who not only arranged for visits to their establishments but whose opinions also contributed to a better planning of the study and a more accurate appraisal of the problems of industry. Lastly, the secretariat officials benefited from the personal contacts - only one facet of the generous co-operation they received - which they were able to establish with a number of Peruvian professionals, University professors and students of the Peruvian economy.

The present study is also largely the result of close collaboration between the ECLA secretariat officials and the experts of the United Nations Technical Assistance Administration and Food and Agriculture Organization stationed in Peru. The initial over-all impressions which the members of the ECLA staff were able to formulate at the outset of their mission facilitated the demarcation of specific fields in which the intervention of technical assistance seemed most urgently necessary and most likely to be beneficial. They also provided a general

background against which the work of experts visiting the country as a result of these recommendations could be better planned; in its turn, the present study embodies many of the findings of the more detailed research subsequently carried out by the experts in question. 4/

It will probably be useful to stress the ultimate aim of this report, which is confined to a preliminary examination of the development and prospects of Peruvian industry. The relatively long sections analysing other over-all aspects were included solely because industry must necessarily be studied in relation to the basic problems of the Peruvian economy, rather than in isolation from other economic activities. Hence, the only purpose of such sections is to provide a general background against which the position of the industrial sector can be more satisfactorily visualized. The analysis is therefore far from complete, and the statistical instruments used are limited and subject to fairly wide margins of error.

In essence, apart from its possible interest from a purely descriptive standpoint and as a survey of past experience, the study aims at assembling the necessary data on which to base the answer to three questions: (a) at what rate would Peruvian industry have to grow in the future for its development to prove compatible with the satisfactory growth of the economy as a whole?; (b) what changes would have to take place in the composition of industrial production, in terms of the greater or lesser development of given branches or specific sectors of manufacturing activity?; and (c) by what means, with what resources, and through what improvements on the nature and method of utilization of the resources at present employed could the industrial growth and changes in composition referred to be achieved?

The first of these questions cannot be answered without fairly accurate knowledge of the lines along which the Peruvian economy has been developing in recent years, of the main factors which have stimulated or retarded its growth and of their probable behaviour.

4/ Particularly so in the case of the sections of the study dealing with chemicals, textiles and forest products.

/On this

On this basis certain alternative hypotheses can be formulated as to the possible rate of growth, in the light of which industrialization requirements can be assessed. In view of the present characteristics of the Peruvian economy, such requirements might derive from the contribution that industry would be called upon to make in order to raise the over-all level of per capita income; from the prospects relating to the capacity to import and the demand for imports, that is, from the greater or lesser degree of intensity which will presumably characterize the import substitution problem; and last, but not least, from the predictable growth of the labour force and the capacity of industry and other sectors to provide the necessary opportunities of productive employment for the steady increase in the active population. These three factors, which are of course closely inter-related, may be considered up to a point as the key elements for estimating the rate of future industrial growth compatible with a reasonably ambitious improvement in the living conditions of the population.

The changes in the composition of industrial production which would have to accompany the growth of industry as a whole are essentially dependent upon the characteristics of demand for the various types of manufactured goods, as well as upon the opportunities offered in the different industrial branches for the economic substitution of domestic production for manufactured goods at present imported.

Consequently, a careful examination must be made of the present composition of Peruvian industry and of the relative shares of domestic production and imports in total supplies of each type of manufactured goods needed to meet the country's current requirements, while future demand for these goods must be projected in terms of the over-all rate of growth and import prospects.

Finally, the third question has a specific bearing on the actual measures that would have to be adopted in order to ensure the growth and qualitative changes deemed necessary for the industrial sector. The study does not aim, however, at giving a conclusive list of measures to be adopted or at defining specific patterns. What it does attempt is to identify some of the existing shortcomings and demarcate possible

fields of action, where it will be the experience of industrialists themselves and of the Peruvian authorities that will best be able to indicate the appropriate measures. Accordingly, an attempt is made to evaluate industry's working capital resources; the extent to which they are efficiently utilized; the factors that may account for deficiencies in this respect; the various techniques applied and their bearing on current production levels; the employment, training and productivity of manpower; and the factors by which such productivity is affected. Finally, consideration is given to the whole set of components making up the environment in which industrial growth takes place. These include, in particular, tax and credit policy, the patterns and purport of protectionist policy, methods of financing the development of manufacturing enterprises, etc.

Even at the risk of presenting an over-simplified picture, it seems desirable, prior to the analysis proper, to make a brief summary of the contents and main conclusions of the study which will be discussed in detail in the subsequent chapters, and at the same time, to include some of the principal observations referring to the preliminary version of the study, which were made when it was submitted to a series of round-table discussions attended by Peruvian industrialists and other specialists, even though many others, which helped to improve certain parts of the analysis or to correct errors, are not mentioned specifically.

SUMMARY AND PRINCIPAL CONCLUSIONS

I. GENERAL PROBLEMS RELATING TO INDUSTRIAL DEVELOPMENT AND THE ECONOMY AS A WHOLE

Main characteristics of the economy in 1955

In 1955, Peru's economy showed the characteristics typical of an undeveloped country. The level of *per capita* income (some 190 dollars annually) probably represented no more than two thirds of the Latin American average. About 60 per cent of the population was living in the rural areas and a similar percentage of the total labour force was engaged in agricultural activities. However, this sector, because of its relatively low productivity, generated only 30 per cent of the national income. By contrast, there was one sector of high productivity - the extractive industry - which nevertheless contributed only 7 per cent towards the national income and employed less than 2 per cent of the active population. The share of manufacturing activities as a whole in total income (17 per cent) was generated partly by industry proper, which is still relatively new, and largely by artisan types of production. In the services sector development was varied. The most important branch was trade, with a share of total income higher even than that of industry proper.

Apart from these aggregate figures, the marked contrasts in the various parts of the economy should be stressed. In fact, two different economies - that of the coastal belt and that of the Sierra - exist side by side. They are linked together only to a very small extent and the differences in their *per capita* income are probably in the ratio of one to three. Similar contrasts may be observed within the productive sectors themselves. For example, a modern export agriculture is counterbalanced by a subsistence agriculture which is very backward technologically, while an efficient and concentrated industry is offset by scattered artisan activities in which four times as many persons are employed.

/The relative

The relative importance of the external sector was rather high: the import coefficient reached the figure of 18 per cent. Exports amounted to some 5 100 million soles, equivalent to about 30 dollars per person, a very unfavourable figure when compared with that registered in other Latin American countries.

On the other hand, Peru enjoyed a rich supply of natural resources, a relatively high investment coefficient and a high rate of economic growth.

Economic growth during the decade 1945-55

Throughout the ten-year period between 1945 and 1955, the gross product expanded at an annual average cumulative rate of 2.9 per cent per capita, which compared very favourably with that registered in most Latin American countries during the same years. Its continuance would not only bring about a gradual rise in the people's level of living, but would also enable Peru to go on improving its relative position in Latin America as regards national income.

The increase in the gross product was also accompanied by certain fairly marked structural changes. The total population grew by 34 per cent, although the rural and urban increments were very different, the former being 23 per cent and the latter 52 per cent. The agricultural sector expanded its output in real terms by 47 per cent, while its relative share in the total national income fell from 33.5 to 30.2 per cent. The manufacturing industry almost doubled its volume of production but its relative share of the national income rose only slightly (from 15 to 17 per cent). The share of the extractive industries remained almost unchanged.

Other advantages allowed a still greater expansion of the goods and services available for consumption and investment. These were the terms of trade, which were positive throughout the decade, and an increase in the net influx of foreign capital which changed a surplus of exports to one of imports. (While in 1945 available goods and services came to 1 000 million soles less the gross product, in 1955 they exceeded it by more than 350 million soles.)

/Another favourable

Another favourable factor - an appreciable improvement in the product-capital ratio - made possible an increase in the gross product without an investment effort of similar intensity. At the same time, there was a substantial contribution from foreign investment, which represented 20 per cent of aggregate investment in 1951-55.

These factors definitely enabled consumption to expand at a swifter rate than the national product: its average rate of increase was 3 per cent annually per capita.

The rise in the import coefficient from 13 per cent in 1945 to 18 per cent in 1955 shows that the external sector played a very dynamic role. However, the marked expansion in imports (120 per cent in real terms throughout the decade) was not accompanied either by a favourable change in their structure or a comparable expansion of exports (only 40 per cent). The trends registered during the period also reveal a very high elasticity of demand for imported consumer goods which amounted to 2.0 over the whole period and 1.57 between 1948 and 1955. Incidentally, while manufacturing output almost doubled in real terms, its expansion was not intensive enough to increase or even maintain the share of domestic industry in the total supply of manufactures. In this sense, it is possible to speak of a relative decline in industrial growth because domestic industry did not seize all the opportunities of expansion offered by the enlargement of domestic demand.

In short, the Peruvian economy expanded very considerably between 1945 and 1955 to judge from the annual rate of increase in the gross product and in per capita consumption (2.9 and 3 per cent respectively). However, this expansion was the result not only of internal efforts, but also of the concurrence of certain favourable factors including a comparatively moderate rise in population, an increase in available goods and services relatively higher than that of the gross product (thus facilitating a more rapid expansion of consumption), an improvement in the terms of trade, a marked rise in the product-capital ratio and a higher import coefficient.

/Development prospects

Development prospects for the economy as a whole

It is now pertinent to express the problem in other terms and consider whether the concurrence of such factors will be equally favourable in the future, or, otherwise, what must be done to maintain a similar rate of economic growth in the years to come.

One of the factors which seems to have changed somewhat as compared with the trends of former years is demographic growth. Between 1940 and 1955, the population increased at the average rate of just below 2 per cent per year. However, towards the end of the period, it was apparent that it was tending to grow vegetatively, mainly as a result of a fall in the death rate. According to the available data, the population should increase by about 2.5 per cent annually between 1955 and 1965. In other words, the total population in these ten years would rise by about 2.5 million and amount to almost 11.5 million in 1965. This increase in the active population would mean the addition of 1 million persons to the existing labour force. Undoubtedly, all these developments will have a marked effect upon the prospects for economic growth and will also make it harder to maintain the rate of increase in the gross product and in per capita consumption.

In recent years, the terms of trade have already fallen below the 1955 level. Any hypothesis which assumes that they will follow a trend similar to that of the previous decade may be considered somewhat optimistic.

Nor does there seem much hope for an eventual improvement in the product-capital ratio although it is difficult to speculate about this factor because its future magnitude depends on many conflicting elements.

Thus, considering the changes which have already taken place or which are likely to occur in the future, it seems unlikely that Peru can maintain a similar tempo and pattern of development as in the previous decade, particularly in the external sector. A significant potential deficit in the balance of payments as well as a heavy demand for foreign capital and imports are therefore to be expected.

Foreign capital needs may be more clearly appreciated with the help of some illustrative figures resulting from a series of calculations in which allowance is made for the limitation already mentioned. It may be concluded

/that in

that in order to increase total consumption from 26 200 million soles in 1955 to 45 400 in 1965 (an annual per capita average rate of 3 per cent), with a simultaneous rise in the gross product from 32 000 to 54 600 million soles (a per capita growth of 2.9 per cent per year), a surplus of available goods and services of 3 780 million soles in excess of the gross product would be required. This sum could only be obtained if there were a net inflow of foreign capital.

Discounting the high import elasticity registered in the decade 1945-55 (2.0) and assuming the more moderate figure of 1.57 corresponding to the period 1948-55, the demand for imports in 1965 would still amount to some 14 000 million soles at 1955 constant prices (as compared with only 5 700 million soles in 1955).

Would it be reasonable to expect that both foreign capital and import requirements can be met? According to the information available, the total foreign capital invested in Peru amounted to some 590 million dollars in 1955. Gross investment in that year totalled about 71 million dollars and remittances abroad under various heads - amortization, profits, interest - were almost 59 million. The net inflow was thus only 12.2 million. If future prospects are assessed on the basis of the estimate made in certain circles that total foreign capital will probably amount to about 1 000 million dollars in 1965, and if the probable changes in the rates of amortization, investment and interest are rather carefully analysed, it may be concluded that a gross influx of new capital amounting to 90 million dollars will be accompanied by a net outflow of foreign capital amounting to about 28 million dollars. Only with a total capital of 1 200 million dollars and a gross investment volume greater than 100 million dollars per year would it be possible to establish a balance between total receipts and the total outflow of foreign capital. However, unless exceptional circumstances arise, it would seem that the attainment of a net inflow of 3 780 million soles is out of the question.

A study of the potential demand for imports leads to an equally negative conclusion according to the detailed projections on agricultural and mining exports presented in the report. As regards the former, it is assumed as

an initial working hypothesis, that the cultivated area could be increased by between 400 000 and 500 000 hectares, a considerable expansion over the present total of 2.5 million hectares. In view of the rise in population and its higher income level, it is estimated that the increase in the production of those goods in which Peru is now self-sufficient might require 360 000 hectares and the replacement of those imports which are at present most important (also allowing for heavier future demand) would require some 195 000 hectares. There would thus remain 140 000 hectares available for the increase in export crops, which would mean in the aggregate an expansion in production of 40 per cent over the present volume of export items. In the case of the extractive industry, the relevant estimates are based on the principal plans of the enterprises concerned. It is assumed, for example, that in 1965 exports of copper will amount to 210 000 tons, of lead 151 000, of zinc 286 000, of iron ore almost 7 million tons, etc. This implies that the present levels of such exports would rise by 148 per cent in real terms.

In short, the volume of total exports might double between 1955 and 1965, reaching in the latter year some 10 000 million soles (at constant purchasing power equal to that of 1955). But this would still be insufficient to meet the potential demand for imports which were estimated at about 14 000 million soles.

In the light of these considerations, it seems highly unlikely that the same rate and pattern of growth as in the previous period can be maintained. Hence, the most probable hypothesis put forward in the study assumed briefly (a) that, as a starting point, the aim is to maintain the rate of expansion of the gross per capita product (2.9 per cent per year); (b) that an increase of the same intensity would be registered in available goods and services since additional favourable factors are not likely to arise; and (c) that, as a result, the increment in consumption will have to be somewhat less than the rise in the gross product (2.2. per cent annually per capita). In their turn, these hypotheses imply at least two requirements: (i) that the investment coefficient can be raised from 19.2 to 23.7 per cent; and (ii) that the income-elasticity of demand for imports can be reduced from 2.0 or 1.57 to only 1.2 while additional changes must be made in their structure.

/Both requirements

Both requirements appear feasible. The investment coefficient had already reached, although in isolated years, figures very close to those indicated. To maintain them consistently at this relatively high level would undoubtedly require a strenuous effort, but it does not appear beyond Peru's possibilities. As regards the reduction in the income-elasticity of demand for imports, even in these circumstances, a somewhat more rapid increase in imports than in the gross product is assumed. In this respect, the problem in Peru is likely to be much less serious than in the other Latin American countries where the anticipated capacity to import remains far below any reasonable rate of increase in per capita income.

The contribution required of industrial development

The general frame of reference provided by the aggregate projections make it possible to examine with some care the possible expansion needs of the manufacturing industry in the light of the hypotheses put forward. At least two factors emerge which are of decisive importance for intensifying the industrialization process: (a) the role of industry in the absorption of manpower and (b) its contribution to import substitution.

The first factor will undoubtedly acquire considerable signficance. The increase in the labour force during the next decade will be extremely large not only in absolute terms - 1 million active persons - but also relatively, since it will represent an increment of 27 per cent over the present level of employment. This factor itself might constitute a serious problem which may well be aggravated by the tendency, already observable in various economic sectors, to economize manpower as far as possible. (For example, expansion plans in the mining industry provide for considerable increases in output, which in many cases will be accompanied by only a very small rise in employment.) This tendency is also to be expected in sectors which must continually strive to improve their competitive position in the world market or in those branches of domestic industry which are facing stiffer competition from imports. But it may well be asked whether, in all these cases, the relative manpower and capital resources available in Peru are ideally distributed.

/The additional

The additional agricultural production necessary to meet the growth of domestic demand, to replace many of the present imports and to increase exports, may well represent an increase of 46.2 per cent over existing levels. In view of the present low level of farm productivity, the pressure of population in certain zones and the inevitable adoption of certain modern techniques, it must be admitted that some improvement in output is bound to occur. Assuming that it represents on the average 20 per cent during the ten years, agriculture would be in a position to absorb 490 000 persons, which would still leave 500 000 persons to find employment in non-agricultural activities. If industry increased its share of such activities to a very moderate extent (merely from 40.5 to 42 per cent), it would have to absorb 230 000 persons. Of these, not less than 100 000 would probably have to be engaged in industry proper, which in 1955 employed a total of just over 120 000 persons.

Its task would be no less arduous as regards import substitution needs. As will be recalled, such needs in the aggregate might amount to some 4 000 million soles by 1965. Assuming that Peru itself can meet all its agricultural requirements, except for a deficit in wheat and a very low level of fruit imports - and bearing present petroleum prospects in mind, it may be concluded that more than three quarters of these total substitution requirements will have to be met by manufacturing production. Considering the secondary needs which would arise from this substitution, it may be estimated that the industrial expansion required for this purpose alone would represent an output value of some 4 400 million soles or about 30 per cent of the total value of manufacturing production in 1955.

In short, remembering the need to increase employment and replace imports while at the same time bearing in mind the pressure of expanding domestic demand and the balance which must be preserved between the growth of industry as well as of other economic periods, the authors of the report concluded that the volume of industrial production would practically have to double between 1955 and 1965. For this purpose, the present stock of capital would

/also have

also have to be twice as large and not less than a quarter of Peru's total gross investment would have to be channelled into industry. Only thus could industry play a positive role in the task of maintaining the tempo of economic development. At the same time, the relative position of industry proper (or registered industry) would be strengthened, the average productivity of this sector would be increased by about 53 per cent, and its share in the national income as a whole would rise to more than 20 per cent.

The pattern of industry and possible changes in it

Of course, industrial development on the scale assumed in this hypothesis cannot be maintained with the same intensity in all branches of manufacturing production. The different demand-elasticities for the various classes of manufactured products and the different import substitution possibilities which appear to exist for each one of them would undoubtedly involve changes in the output pattern and in productive capacity.

A cursory glance at the present structure of Peruvian industry reveals that it is concentrated around three industrial branches: processed foodstuffs, beverages and textiles. These absorb more than half of total industrial employment and represent almost 60 per cent of the value of production, while the joint output of the chemical and metal transforming industries constitutes less than 10 per cent of the total. From another angle, more than two thirds of production is of consumer goods while capital goods represented less than 5 per cent. This is actually a normal stage in the industrialization process at which efforts are made to cover first the lines of production which as a rule are technically less complex and which call for a small capital outlay. However, in the course of very rapid industrial development, such as occurred in former periods, there are no very marked changes aimed at producing increased diversification. For example, between 1948 and 1955 the share of consumer goods in the total dropped merely from 60 to 58.5 per cent and there were no such changes in the structure of productive capacity. In 1955, the three branches mentioned represented some 63 per cent of the book value of available assets and accounted for 60 per cent of the total purchases of machinery and equipment.

/Another important

Another important observation concerns the share of domestic supply covered by the various branches of Peruvian industry. In 1955, imports of manufactured goods (expressed in CIF values, which implies that they were to some extent undervalued) represented a quarter of total requirements for such goods. Although imports were registered for practically all manufacturing branches, two were of particular importance: chemicals and products of the metal transforming and metallurgical industries. They represented 69 per cent of the total imports of manufactured goods. The share of imports was also quite appreciable in the supply of goods from the pulp and paper industries (50 per cent), timber (30 per cent), rubber (25 per cent) and non-metallic minerals (22 per cent). On the other hand, it was relatively small for processed foodstuffs, beverages, textiles, footwear and ready-made clothing, but even these amounted to 804 million soles, i.e. they represented about 15 per cent of Peru's total capacity to import. Generally speaking, no notable improvements were recorded in this respect. On the contrary, between 1948 and 1955, total availabilities of manufactured goods in Peru rose by 71 per cent as a result of an increase of 90 per cent in imports and only 67 per cent in domestic production.

If these two factors are considered jointly in the light of the hypothetical projections presented in the study, the trend and magnitude of the changes which might take place between 1955 and 1965 will become apparent. The relevant estimates show for example, that, although all the branches increased their volume of production in varying proportions, the relative importance of the food industries would decline from 36.4 to 28.2 per cent and that of textiles from 11.0 to 10.6 per cent. By contrast, there would be an increase in that of the chemical industries (from 3.7 to 5.5 per cent), the metal transforming industries (from 4.6 to 7.5 per cent) and the basic metals industries (from 7.2 to 13.1 per cent), etc.

/The problems

The problems of financing, protecting and encouraging industrial development

Increased domestic demand, import substitution requirements and the need to absorb manpower make it essential to achieve a certain tempo of industrial expansion and to effect a series of changes in the production pattern by industrial branched. This involves the enlargement and diversification of productive capacity and the consequent financing and effective channelling of investment. Can Peruvian industry carry through this over-all expansion? This is another of the problems examined in the report, although no attempt has been made to go into detail. Some of the existing facts and certain information that could form the subject of special research are briefly analysed.

Once the expansion needs of production have been established, the investment effort required will depend to a large extent on the manner in which the present stock of capital is used, i.e. on the product-capital ratio achieved in industry. The practical analysis of this specific problem is not at all easy, because there are hardly any reliable statistics on the actual amount of capital invested in the sector. All that is available is partial information about the book value of assets, which is of little real use because it relates to investments accumulated in different periods and depreciated according to book-keeping rather than realistic criteria. However, an attempt at indirect measurement led to the conclusion that total fixed capital - depreciated at replacement cost - employed in industry in 1955 was probably about 13 000 million soles. This would mean a fairly favourable product-capital ratio: 0.41 as compared with only 0.33 in 1945. In other words, the phenomenon noted for the economy as a whole, whereby a prior improvement of the product-capital ratio subsequently relieved the pressure on investment, was repeated in a more marked degree. However, the favourable level of 1955 should not be construed as indicating that capital already invested was being utilized with any great intensity - on the contrary, there was still plenty of room

/for improvement

for improvement in that respect -, but should be attributed rather to the large share of artisan and small-scale industries (with very limited capital resources) and to the predominance of industrial branches of less capital intensity. In the future, the increased relative importance which industry proper will undoubtedly continue to acquire and the more marked growth of industrial branches of higher capital intensity will tend to lower the product-capital ratio. The only remedy would be to ensure a better utilization of the present stock of capital, a task which depends mainly on what can be done within the enterprises themselves.

Even if the product-capital ratio is maintained, the main problem will be the incentives which can be offered for the enlargement and diversification of investments. As a result, two basic questions, (a) methods of financing and (b) industrial protection, will assume greater importance.

Adequate consideration of the first aspect would require a detailed analysis of the possibilities of enlisting resources both within and outside the enterprises. If some of the developments during the period 1947-55 are examined, it may be observed, from a very broad though variable sample of enterprises, that their total assets rose from 1 500 to 9 000 million soles. Almost 40 per cent of this increment was the result of capital gains, a resource which cannot be considered as altogether external to the enterprises because it is derived to a large extent from the issue of bonus shares, i.e. a form of re-investments of profits. A sixth of this expansion was financed with such typical internal resources as increases in reserves. A small proportion was financed with temporary resources and almost 40 per cent with typically external resources. In short, the information available is such that no very firm conclusions may be drawn. In other words, this is one of the further problems which merits more detailed inquiry. In the meantime, the analysis confines itself to a very cursory examination of some of the principal ways of mobilizing resources for industrial investment.

One of the sources which might acquire considerable importance not only for the enlargement but also for the diversification of industrial investment is the capital market. At the moment, most enterprises are legally

/constituted as

constituted as limited companies. Nevertheless, there is no control of such companies, nor are there any bodies with sufficient power to supplement the somewhat restricted activities of the stock exchange. Furthermore, under the existing system, most securities are not quoted at all on the exchange, where apparently only a very small proportion of total transactions take place. Thus, for example, while in 1956 the total new capital registered was 776 million soles and capital gains amounted to 247 million, the total movement of securities on the stock exchange was valued at barely 14.8 million.

The ploughing back of profits will undoubtedly play an important part in the future expansion of industrial productive activity. During the period 1947-55, the total net profits of registered industrial enterprises amounted to some 2 500 million soles. Of this sum, less than 25 per cent was capitalized, a proportion which would probably be much lower if allowance were made for the large number of minor establishments not included in the statistics.

Of course, the scale on which profits are re-invested depends on many factors which are outside the immediate scope of the study. Suffice it here to make brief mention of only two: tax policy and the constitution of depreciation reserves. The first factor does not appear to offer very powerful incentives for re-investment because there is no differentiation for tax purposes between distributed and undistributed profits. Even more important is the policy followed with regard to the constitution of depreciation reserves. Calculations are based on the original rather than the replacement cost of assets. Since insufficient reserves would thus be formed, they are supplemented with additional reserves, which thus become liable to tax as though they were actual profits.

However great the investment effort made with internal funds, the necessary expansion of industrial productive capacity could probably not be embarked upon without adequate provision of credit resources. On 31 December 1955, total bank credit granted to industry amounted to 1 154 million soles or less than 10 per cent of the assets of the

/manufacturing enterprises.

manufacturing enterprises. About 95 per cent of this credit came from commercial banks which used for this purpose roughly a quarter of their lending capacity. This represented a slight improvement in the share of industry as compared with the years immediately before. The situation was different in the case of development banks. Of the total credits granted by them, (898 million soles), less than 10 per cent went to the industrial sector, as compared with more than 40 per cent in 1945. These changes in the relative magnitude of the credit sources available to industry have both a qualitative and a quantitative significance because of the different interest rates and above all the differences in the terms of amortization which are applied to each case.

Finally, there are other sources of financing whose relative importance has been somewhat restricted in the past. For example, in 1955 total public investment amounted to 1 764 million soles, of which only 70 million could be considered as directly related to industrial development. Foreign investment in manufacturing, on the other hand, has increased considerably - from 14.9 million dollars in 1951 to 26.8 million in 1955 -, but its volume is still very slight as compared with that of total industrial investment or with the share which foreign capital represents in other economic activities.

In addition to these factors, which principally affect the various financial aspects of industrial expansion, there remains a whole series of incentives which may be offered through protective and development measures. Although there is no direct participation by the public sector in industrial activities, the Government can, of course, exert a powerful influence in their development, not only by providing the basic social capital - transport, energy, etc. - essential for industrial growth, but also by providing numerous incentives many of which are already contained in a general industrial bill now being given favourable consideration.

One particular important aspect is the protection of domestic industry against competition from imports. Since 1949, when direct import controls were lifted, the protection machinery has been mainly confined to the customs tariff. This however is framed for fiscal purposes rather than for the

deliberate purpose of protection or industrial development. In 1955, total customs duties represented 11 per cent of the value of imports, a relatively low proportion compared with that of other Latin American countries. A more detailed comparison with the tax systems in force in Colombia, Chile and Venezuela shows, moreover, that in Peru customs duties are relatively lower for consumer goods and intermediate goods and very similar in the case of capital goods. Sometimes, the tax is heavier on goods produced by very complex industrial processes, while it is relatively lighter on other goods which could be replaced very soon by domestic production. However, this is a very difficult problem to assess in general terms because of the conflicting elements which must be taken into account. For example, the low level of production may have discouraged the establishment of new import substitution industries, while at the same time, competition with imports has made domestic firms more concerned with productive efficiency than is normally apparent in other Latin American countries. Perhaps the most important problem is how to achieve enough flexibility to meet varying future conditions and to ensure that Peru's industrial development goes ahead at the required speed.

Certain comments on the projections and the extent to which they may affect the basic conclusions of the study

At a series of meetings held jointly with ECLA economists a group of Peruvian industrialists, economists, officials and other authorities made certain comments on the initial draft of the study. Although many of them were incorporated in the final text or were used to correct specific parts of the analysis, those relating to two basic aspects of the chapters concerned with the Peruvian economy as a whole seem to merit special emphasis.

The first of these comments refers to export prospects. It was generally agreed that it would be difficult to achieve an increase in the export quantum of the magnitude foreseen in the study. Actually, three years have passed since the period taken as the basis for the projections (1955) and during this time the growth in exports registered in former periods has been far from being attained. At the same time, international market conditions have by no means encouraged a more rapid development of productive

/capacity in

capacity in the export sector. Hence, there seems little likelihood of a recovery of sufficient momentum to exceed the 1955 level by the wide margin foreshadowed in the study's working hypotheses.

Although these opinions may prove correct and although the increase in the capacity to import may turn out to be lower than that anticipated in the projections, the study would still at least provide the methodological outline necessary for evaluating the consequences of the situation projected. Generally speaking, it is easy to foresee the two alternatives facing the Peruvian economy: (a) that of carrying the import substitution process much further than the limits anticipated or (b) that of accepting a rate of economic growth of less intensity than that postulated in the study's hypotheses and hence less than that achieved in the previous decade.

The second observation concerns the projections of demographic growth. As no population census was held after 1940, any projection of the future increase in the number of inhabitants remains highly doubtful. The study embodied the partial data which seemed most trustworthy but doubtless this is not the only information available nor is it sufficiently conclusive. Various comments were made to the effect that population growth would probably not be so intense as that assumed in the hypotheses and that consequently the requirements of subsequent development would not be so rigorous, particularly from the point of view of employment.

Naturally, any change in this respect would, to some extent, alter the projections which have been made. However, this by no means signifies that the qualitative conclusions reached by the study are impaired. Not only are they based on very large quantities - so that slightly more accurate figures would make no difference to their validity - but they are also justified statistically.

Two examples may be quoted. The doubts about the projections of future growth are based largely on the contention that the hypotheses used in the report presuppose a sharp decline in the mortality rate, whereas such a phenomenon would normally be more gradual. No doubt this observation is well-founded but a more careful analysis of the problem would very probably yield the conclusion that in former periods the decline

had already set in without being taken into account in estimates of population growth up to 1955. In other words, the error perhaps lies not so much in the future hypotheses as in the statistics which have been used for the latter years of the previous period. The projection constructed in the study definitely indicates for 1965 a total number of inhabitants lower than the average population estimate worked out by United Nations demographic experts.[1/]

Almost the same might be said about the projections of active population. Several of the coefficients relating to the break-down of this demographic sector by age groups may well be considered very high. However, the pertinent corrections would affect the 1955 figures in the same way as those for 1965. Hence, the relative growth of the labour force would be very similar to that given in the report. Moreover, if lower coefficients were applied to other population projections which assume a more rapid demographic growth - for example, the average estimate made by the United Nations - even the absolute growth of the labour force would approach very closely to that foreseen in the study.

In short, both the methods used and the hypotheses put forward in the study are undoubtedly susceptible of revision and improvement but any possible changes are very unlikely to modify the general picture, especially as regards those problems which the report is basically trying to solve.

1/ See United Nations, Bureau of Social Affairs, Population Studies, N°21, "Future population estimates by sex and age," Report II, The population of South America 1950-1980 (ST/SOA/SER.A/21), United Nations publication, Sales N°: 1955.XIII.4.

II. MAIN BACKGROUND DATA AND PROSPECTS OF INDUSTRIAL GROWTH

From what has been said so far it may be concluded that, in order to achieve a satisfactory rate of economic development, Peru must (a) at least double its manufacturing production between 1955 and 1965; (b) increase the number of workers employed in manufacturing proper by 100,000 before 1965; (c) effect import substitution to a point where foreign exchange requirements do not exceed 9,310 million soles for purchases of manufactured goods and 11,660 million for total imports; and (d) modify the structure of industrial production in such a way as to improve substantially the share of intermediate and capital goods.

This document will now examine the existing industrial situation in order to relate the possibilities of increasing production to the needs of economic development.

General characteristics of existing installations

Existing industries may be divided into five broad groups. The first comprises those activities based primarily on a large export market, such as sugar production, metal-refining and fish-canning. They are characterized by their marked efficiency, their high degree of utilization of productive capacity (in nearly all cases) and their excellent productivity, even when judged by the strictest standards of the industrialized countries.

Secondly, factories producing tyres, cement, glass bottles, welded tubing, aluminium shapes, insulated electric conductors, articles of fibre cement, edible oils and fats, and evaporated milk are examples of industries which have been recently established with modern machinery and techniques, foreign technical aid and high standards of quality. While their labour productivity is generally good, the degree of utilization of their equipment is low on the average. They are designed to satisfy those sectors of the Peruvian market which only recently have represented a demand big enough to justify efficient and economic installations.

Generally speaking, the third group is made up of industries which are artisan by origin. In some cases, they have become modernized and have completely changed their methods but, in many other instances, they

have preserved intact their administrative structure and even some of their production techniques. In other words, they are still run by their owners almost without intermediate staff. They have not instituted additional shifts in order to expand their utilization of capacity through failure to delegate authority and through lack of technicians capable of taking charge of the extra operations involved. Precisely because of their artisan type of organization it has proved impossible to train such supervisory personnel. The main components of this group are footwear and ready-made clothing, leather and certain metal transforming industries.

Fourthly, textiles form a group on their own because their size and characteristics are quite different from those of the remaining industries. They are not artisan by origin although there is a fairly large wool industry of that type. Nevertheless, they are characterized by over-employment. About 60 per cent of their machinery is out of date - 76 per cent in the case of yarns and 48 per cent in that of fabrics - and though they are run by highly efficient managerial staff, the basic organization is generally very unsatisfactory because equipment is out-of-date and there are too many workers per productive unit. As a result, productivity is very low compared with what might be achieved in modern and well-organized factories. (The proportions are respectively reckoned to be 36 and 55 per cent in spinning and weaving mills operating with cotton; 19 and 36 per cent in those using wool; 36 and 49 per cent in those employing cut fibre; and 50 per cent in weaving factories based on filament.)

Fifthly, much of what has been called industry is really of the artisan type, especially in the case of metal-transforming, furniture and fixtures, footwear and ready-made clothing, and foodstuffs. The fact that certain activities are so predominantly artisan in character - furniture, men's shoes, some glass containers and chemicals - is a sign of backwardness because market conditions no longer justify the survival of their antiquated production techniques. Much manpower is wasted and the finished article can no longer compete with that turned out by mechnized installations.

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On the other hand, certain artisan sectors still flourish in an economic climate like that of Peru because they are quick to adapt themselves to stylistic changes in specified consumer products and because they can produce economically articles which require a heavy labour input and little mechnization. Into this group fall many foodstuffs, leather products, women's shoes, luxury glassware and ornamental ironwork.

Of the total value of industrial output, which in 1955 was 16,795 million soles, about 19 per cent corresponds to the export industries (including their production for the domestic market), 8 per cent to recently established industries that are not artisan by origin, 27 per cent to those that were originally artisan but were converted into manufacturing industries proper, 11 per cent to the textile industry and 35 per cent to purely artisan activities. The relative share of each of these groups would be different if the criterion adopted were the value added instead of the gross value of production.

Contribution of industry to the domestic supply of manufactured goods

Industries may be classified into three groups according to the present margin of import substitution. The first group would include most of the food industries, beverages, tobacco, textiles, footwear, printing and publishing, cement and other construction materials, leather and leather goods, petroleum and coal derivatives, and non-ferrous metals. All these industries satisfy a large proportion of demand (more than 80 per cent in most cases). Hence, although they still leave a certain margin for import substitution, this is no serious obstacle to their development. The main problem is how to channel artisan activities into the manufacturing sector proper so as to increase productivity and improve quality. In this way, the domestic market for such products will be amplified because in nearly every case there is a big gap between real and potential demand. One outstanding example is the production of canned fish, which could do much to relieve the shortage of protein foods but which must be reduced in price and boosted in other ways, if consumption is to rise among certain sectors of the population. Another

is that of wool textiles and footwear. In this case, price cuts would produce a proportionately much greater increase in domestic demand.

So far as the satisfaction of the home market is concerned, the second group of industries would comprise those which potentially could meet requirements because they have sufficient raw materials and outlets broad enough to justify installations of economic scale. Nevertheless, and for other reasons - particularly quality and cost -, such industries have been unable to cope with foreign competition and cover a very low proportion of demand (between 50 and 70 per cent). They include ready-made clothing, china, majolica, ceramics, timber, paper manufactures and some rubber products (except vulcanized footwear and tyres). This is probably the group where it is hardest to remedy deficiencies because it is often necessary to modify existing organizations, introduce new techniques, change or improve raw materials and even overcome traditions and prejudices. Nevertheless, it is perhaps the group where, because of the wide margin of idle productive capacity, larger increases in output may be secured with a relatively smaller outlay.

The third group covers those industries whose development is negligible or rudimentary primarily because of the lack of industrial enterprise and, to a lesser extent, because no incentives have been offered for their growth, including some degree of protection during their initial years. Most metal-transforming and many chemical industries would come into this category. A few years ago, this group might also have included the iron and steel industry whose first mill is already in operation and will undoubtedly stimulate further development. By definition, these industries have a very low production compared with the absorption possibilities of the market. At the same time they provide ample opportunities for accelerated development. Indeed, it will be be seen later that most of the development prospects analysed in the third part of the study concern this group.

/Development possibilities

Development possibilities consequent upon increased satisfaction of the people's basic needs

Demographic growth and increases in per capita income levels, coupled with the relatively high elasticity shown as a rule by the demand for manufactured goods, will bring about in the next decade a very marked increase in the supply needs of the domestic market. This fact is implicit in the assessments and comments made in the following pages.

Particular emphasis should be laid on those primary needs of the population which are far from being satisfied and which represent a potential demand not revealed in the statistics. The food sector is probably the most important in this respect. Here, the Government must take further action because the possibilities of expanding food production are impeded by certain obstacles, particularly as regards the supply of raw materials.

In their development plans the authorities responsible for industrial promotion should establish vigorous incentives designed to augment cattle-slaughtering, the manufacture of milk products and the production of edible oils and fats. In the first two cases, the complete solution of the problem of raw material supplies would require a period of time which goes beyond the limit set for this study. Production incentives would have to be initiated as soon as possible but the development expected for 1965 - an increase in meat output of 56 per cent and in milk products of 53 per cent - is very unsatisfactory. The production of edible oils and fats of agricultural origin may be developed over a relatively shorter period; it depends to what extent farmers are encouraged to plant more oil-bearing crops. (The study assumes an increase of 156 per cent in the period 1955-65.)

Another important sector where it is possible to assume a demand heavier than that shown in the statistics is the production of canned fish. In view of the lack of protein in the people's diet, output might be encouraged if this product were popularized and if the industry strove to reduce its costs. As explained later, this seems feasible.

/An opportunity

An opportunity for industrial development in response to a potential repressed demand might also be seized by the textile industry, principally wool. The needs of the Peruvian people in this respect are far from being met because prices are usually high as a result of inefficient installations, out-of-date machinery and over-employment. Hence, there is a wide margin for an increase in production (122 per cent in the manufacturing textile industry during 1955-65) although development is impeded by certain problems which must be solved immediately.

A final example of a line of production which could help to meet the basic needs of the population - although in this case indirectly - would be the manufacture of synthetic fertilizers in sufficient quantities to bring about a substantial increase in agricultural food production, especially in the sierra. According to a relatively conservative hypothesis, it has been assumed that by 1965 Peru would need some 89,000 tons of nitrogen and 67,000 tons of phosphoric acid. As the production of guano is expected to remain relatively constant and to represent about 38,000 tons of nitrogen and 40,000 tons of phosphoric acid, a considerable industrial effort would be required to bridge the gap with chemical fertilizers. However, it would probably reap a bigger economic yield because it would do much to improve the population's diet.

Development prospects in export industries

Another sector which may be explored for possibilities of industrial development is that of exports which, as part of a suitable policy of promotion, should take first place as regards incentives, protection and assistance. The biggest expansion as regards both tempo and value of production would undoubtedly occur in non-ferrous metallurgy, especially copper and zinc. For various reasons, which are explained in detail in the relevant chapter, output is expected to increase when the expansion plans of the undertakings concerned are put into effect. During the period under review, such plans will probably raise production from 1,212 million (the 1955 figure) to 2,860 million, the biggest advance recorded by the industry in terms of output value.

/The development

The development of sugar production is likely to be much less dynamic because the cultivated area, like that planted to cotton, is expected to increase very slowly and at the cost of large-scale investment designed to provide irrigation for additional land. Most of the production increment would be absorbed by the additional domestic consumption. Hence, by 1965 Peru would have only 722,000 tons of sugar of export, which would mean a rise of 50 per cent in production for this purpose.

Canned fish for export is one of the sectors most in need of bolstering against a probable decline. Recently it has been very hard pressed by foreign competition. However, a careful examination shows that its economic basis is for the most part just as good or even better than that of its rivals abroad and that it could compete with them successfully provided it could cut production costs. This might be feasible so far as expenditure on the fish itself is concerned if supplies could be stabilized by building large cold storage plants in the bigger fishing ports. The cost of containers might be reduced too if a large proportion of Chimbote's capacity for producing flat sheet were set aside for this purpose.

Exports of timber products - at least in so far as present shipments from Iquitos are concerned - hold out few prospects of expansion. Other production sites, such as the state of Pará (Brazil) and certain Central American republics, can compete with Peru on more favourable terms because they are nearer to consumption centres. The only line of defence might be increased industrialization, particularly as regards veneers made of cedar, mahogany and other Peruvian woods which so far remain untried. There are also possibilities in the production of plywood overlaid with veneers of finer timber. With a higher value per unit of weight and volume, this type of product, when produced on a more industrialized scale, would be better able to compete on foreign markets.

Another sector in which there are excellent prospects of industrial expansion based on exports is that of long-staple cotton textiles. The

fact that the extension of the cotton acreage is becoming increasingly difficult presupposes that the relative share of this product in exports will tend to diminish. However, since the cotton in question is of remarkably high quality, Peru should make the most of such a valuable raw material by processing at least part of the export crop, in the form of yarn, thread, or fine all-purpose cloth, such as poplin. The same might be said of alpaca hair, a raw material even more exclusive than long-staple cotton because it is produced only in a relatively small area of the Andes. For these reasons and because of the need for cutting costs in the production of textiles for domestic consumption, so as to increase demand and do more to satisfy the people's needs, the study has recommended a complete renovation of the textile industry, both as regards its installations and its techniques. In monetary terms, this would require an investment of 675 million soles during the period under review. In addition - a still harder task - other industries would need to absorb at least 7,000 workers who would have become redundant by 1965 upon completion of the modernization programme.

Development prospects made possible by channelling artisan production into the manufacturing sector proper

Another possible way of promoting development is to guide artisan activities into strictly manufacturing channels. Opportunities vary greatly from branch to branch. For example, most metal-transforming activities could be re-organized and become part of industry proper which would then expand by 427 per cent during the period 1955-65 while artisan production would rise by only 11 per cent. The making of leather articles lies at the opposite extreme. Indeed, since such products require neither mechanization nor repetitive processes but nevertheless absorb considerable labour, there would be more room for expansion in artisan than in industrialized operations. Between these two extremes lies a varied range of possibilities of transforming artisan work into manufacturing industry. For example, although artisan-produced textiles enjoy a well-deserved reputation in Peru, they are unlikely to forge ahead because they cannot compete with the large-scale manufacture of commonly used articles. If they appear to do so

/it is

it is only at the expense of labour employed at ridiculously low wages.

After metal-transforming, the artisan activity which seems best suited for transformation into an industry proper is the production of furniture and fixtures because it involves a smaller proportion of workshops and because in this branch artisan methods offer no real advantages over manufacturing techniques, except in isolated and inaccessible markets.

A third example, which is also very important, is the production of footwear and ready-made clothing. In this branch, certain activities which still have a dynamic artisan production are mixed with others that should fairly soon be placed on an industrial footing. Artisan workers turning out women's shoes, for example, are well equipped to compete with industrial output, especially because they react quickly to changes in style and operate with tiny production series. The case of men's shoes is different because standardization and mechanization yield considerable economic benefits in this branch. A final example is the production of cashmere suits which, except for luxury tailoring, no longer has any chance of surviving as an artisan activity.

Industrial development made possible by bringing artisan activities within the manufacturing sector proper may be assessed by comparing the rates of growth assumed in this study. While industry in the strict sense is expected to increase production by 137 per cent, artisan activities will expand by only 37 per cent; and while the former will boost its value by 14,800 million soles the latter's will rise by no more than 2,200 million. The authorities responsible for planning industrial development should therefore remember that the transformation of artisan activities offers a fruitful field for economic progress. It should therefore be encouraged and where necessary provoked. However, they should also bear in mind that it is not necessary in all cases because some artisan sectors can still preserve their dynamic character. For example the artisan production of ordinary bricks, luxury glass products, ornamental ironwork, high-class ready-made clothing, fancy leather goods, and silverware will without doubt continue to develop vigourously and offer little scope for industrialization.

Possibilities of development through import substitution

An assessment of industrial development possibilities through import substitution should not consider merely the increased contribution likely to be made by aggregate domestic production towards the satisfaction of demand. The need to boost imports, especially of machinery and equipment as well as of certain raw materials and intermediate products, is part and parcel of the actual process of industrialization which is to be encouraged. Indeed, although Peruvian industry will strive to substitute domestic output for many of the goods now imported, the extent to which it will help satisfy demand, expressed as a percentage, would rise only from 76.0 to 78.5. An accurate evaluation of the substitution effort must be based on the projections of many important items and products which are analysed in the study. However, the following figures give a rough idea: the ratio between production and demand would grow from 88 to 91 per cent in the case of consumer goods, from 26 to 35 per cent in that of capital goods and from 72 to 77 per cent in that of raw materials and intermediate products.

Like many other Latin American countries, Peru has much leeway to make up in import substitution. The decisions adopted regarding the amount of substitution which can actually be effected are of course influenced by the usual financial and technical factors. But at the same time the criteria followed for carrying out a specific development policy play a very important role. For example, it may seem over-ambitious for Peru to seek to substitute domestic production of fertilizers for its imports, now valued at 60 million soles, and increase this figure by 340 million before 1965. This hardly a conservative target but, as part of an organic plan, it would provide an answer to the vital problem of producing more foodstuffs of agricultural origin. In a similar although more limited way, the report has examined the possibilities of replacing many other imports, such as iron and steel products, timber items and certain machinery and equipment, while bearing in mind implicitly the aim of promoting industrialization in certain sectors which are organic or basic for other types of development.

/In working

In working out the possible and desirable relationships between domestic production and demand, in the period up to 1965, the study has tried to analyse many different criteria and particularly those of national interest. They were not all applied in every case because often there was a basic reason for the decision without need for further considerations. Generally speaking, they took account of: (a) the amplitude of the market, as compared with the minimum economic scale of industrial installations, a factor which immediately disqualified many manufactures not yet suitable for domestic production; (b) the fact that the product might be used as a raw material for another industry or that its manufacture might be based on items turned out by an already established industry, particularly if the latter needed to boost its output to secure more economic operation; (c) that industry in general might utilize certain domestic resources or add value to them by additional processing; (d) that a specific industry might contribute directly or indirectly to the generation and distribution of electric power or to the production and distribution of fuels; (e) that it might help to expand transport services and reduce their costs; (f) that it might manufacture construction materials or equipment for this purpose and (g) that it might turn out capital goods, especially agricultural and artisan tools, machine parts and spares, as well as machinery and equipment for industry, mining and agriculture.

As may be seen in the relevant chapters of the study, more than 200 items of products were analysed. It would therefore be difficult to summarize here the conclusions reached. The following paragraphs deal with the activities which are considered most important, either because of the volume of additional production they are expected to achieve or because they serve as an example in the application of certain criteria.

The reasons for encouraging additional output of cheaper textiles for general consumption have already been explained. It also seems likely that, given proper organization and the replacement of obsolete equipment, the industry may produce articles of the quality necessary to effect import substitution on a large scale. For example, during

/the period

the period under review, the ratio between production and demand for flat textiles of cotton, wool and filament might rise to 92 or 93 per cent from the present figure of 83 to 84 per cent. The 7 or 8 per cent assigned to imports would be more than enough to purchase abroad certain products which it is either impossible or uneconomic to manufacture in the relatively small quantities needed by the Peruvian market. Cut-fibre textiles, output of which now covers barely 62 per cent of demand, might expand on a still greater scale than other textiles, because the intensive use of mixtures of different types of fibre (including natural fibre) would confer considerable flexibility on this branch of production and enable it to meet the various applications or requirements of fashion. In order to achieve this increased flexibility, no attempt should be made to reach a very high percentage in the domestic production of the raw material. Hence, a slight decline has been assumed in the ratio between output and demand as regards the artificial fibre industry.

As an activity supplementing textiles, the ready-made clothing industry would have ample opportunities for import substitution. Indeed, its contribution towards the satisfaction of total demand might rise from 56 to 86 per cent; in other words, by 1965, domestic production would have increased by more than 500 million soles.

Although Peru has vast forest resources, it imports 40 per cent of the timber it consumes. The main problems concern the reduction of costs, logging and removal, the saw-mills and transport across the cordillera. Their solution requires a vigorous and clear-cut Government policy implemented by bodies which can take long-term action. However, much can be done now in the way of import substitution. With better organization, saw-mill costs can be reduced and more value added to the timber in the forest itself so as to cut freight expenditure in relative terms. One way of achieving this latter aim would be to manufacture particle boards. This could even be done on the coast with veneers from the forest and sugar-cane bagasse.

If the manufacture of pulp for paper-making on the basis of bagasse were developed, Peru could substitute domestic output for more than

/70 per cent

70 per cent of its imports, valued at some 42 million soles. To increase the import substitution of pulp the problem of obtaining supplies of the raw material necessary for long-fibre cellulose would have to be solved. This would take longer than the period to which this study related.

The manufacture of tinplate merits special attention. If it were produced economically, fish canneries could reduce the cost of their containers. It has already been seen that this move would boost exports. Hence, the model showing the hypothetical development of the iron and steel industry is based implicitly on the proposal that Chimbote should assign a higher priority to tinplate than to galvanized sheet. Imports of the latter may be replaced with asbestos-cement or fibre-cement sheets which Peru can turn out efficiently and economically. It has also been assumed that preference would be given to the production of those sheets most commonly used in the metal-transforming industry, such as all those employed in stamping, including deep inlaying. Imports of tinplate might be completely replaced in 1965 with a domestic output of about 16,000 tons. If Chimbote doubled its flat-product capacity some 6,250 tons of galvanized sheet and 7,900 tons of other sheet for metal-transforming could be produced. In this way, the total import substitution of flat products would amount to some 123 million soles by 1965. The contribution of domestic output to the satisfaction of demand would thus rise from nil in 1955 to 76 per cent in 1965.

One of the iron and steel products which most lends itself to import substitution is rod, used mainly for construction. By 1965 Peru would be able to satisfy all its requirements and achieve an import substitution worth 136 million soles. However, the development model for the iron and steel industry presupposes that Chimbote will have to devote its bars and shapes section to products of greater value per unit of weight, such as light shapes for metal-transforming, and that the production of rod for construction will have to be developed in a new factory (or factories) sited possibly in the Lima area, near to the most important market for this product and the main source of its

/raw material

raw material (scrap). Because of their economic scale, these establishments would be better equipped than a completely integrated mill to turn out this kind of steel.

The import substitution prospects as regards other bars, shapes, thick wire and plate would be very limited should the domestic production of the wide variety of types and sizes required by the market prove to be uneconomic. Consequently, although it has been assumed that Chimbote's steel-making capacity will be enlarged, which would also mean that more bars and shapes could be rolled, in 1965 it might devote only some 28,000 tons of its capacity to the production of various bars, shapes and plates for the metal-transforming industry and with its surplus capacity manufacture some 22,000 tons of constructional rod. In short, by 1965 Peru's own output would replace imported bars, shapes and plates to the value of some 209 million soles and thus satisfy 73 per cent of demand in this particular branch.

As regards import substitution, the sector which merits closest study is undoubtedly that of machinery and equipment for industry, agriculture and mining. The greater this substitution, the easier it will be to fulfil one of the conditions of economic development, namely, that the structure of production should be modified in favour of capital goods as well as raw materials and intermediate products. However, hasty decisions made without prior and careful analysis may lead to the establishment of capital goods industries which are economically and technically deficient. These might prejudice the remainder of industry if an attempt were made to impose the utilization of their products with the help of protection measures. The projections of import substitution contained in the model constructed in the report are not the result of such detailed study and hence must be construed merely as an indication of what is possible. However, in order to determine the share of domestic production which may be considered compatible with demand, a more intricate set of criteria than that applied to the products of other industries was used. In addition, certain numerical indices were taken into account. They related to the value added to the metal, which was roughly estimated as the difference between the c.i.f. price per kilogramme

of the product and the basic metal machinery and equipment needs, expressed as the percentage ratio between investment in this type of assets and the total fixed assets required; and the numbers of highly skilled workers which would have to be employed. Allowance was also made for other factors, such as the diversity of products, the complexity of manufacture, the rate of growth of demand and domestic raw material needs.

The following are some of the more significant estimates for import substitution by 1965: water pumps - 60 per cent and 45 million soles; air compressors - 35 per cent and 60 million soles; transmission equipment for mechanical energy (mainly pulleys) - 78 per cent and 20 million; electric motors of less than 25 hP - 70 per cent and 20 million; transformers of less than 100 kVA - 70 per cent and 24 million soles. The less common types of these capital goods, as well as components which are too complex or specialized to be made in Peru, would be imported.

The metal-transforming industries could also achieve a fair amount of import substitution in certain straightforward manufactures, such as tinplate containers (production equivalent to 87 million soles or 82 per cent of demand by 1965), iron accessories and other hardware (11 million or 50 per cent), steel furniture (26 million or 80 per cent) and cutlery (6 million or 40 per cent). There would also be plenty of room for import substitution in the manufacture of certain consumer durables, like refrigerators, the production of which might rise to a value of 46 million soles in 1965 (60 per cent of demand) and bicycles which might bring in 47 million soles (90 per cent of assumed consumption).

Possibilities of development through industrial integration

Finally, there remains what might be called the integration of industrial activities. Development in this field would take the form of promoting certain types of industry whose establishment would be justified not so much because they would facilitate import substitution, satisfy repressed demand or increase exports, but because they would make possible - or more economic - the development of other industries.

/Apart from

Apart from basic chemicals and iron and steel products, already dealt with in connexion with import substitution, typical examples of Peruvian industries which lend themselves to this type of integration would be chemical activities based on chlorine, smelting and forging in the iron and steel sector, together with die-making and the production of motor-vehicle spare parts in the metal-transforming industries.

The manufacture of caustic soda cannot be developed exclusively with electrolytic processes because they leave a chlorine surplus which is difficult to dispose of and which, for the moment, other industries cannot absorb. It is therefore vital for Peru to establish industries which absorb large quantities of this sub-product, such as insecticides and plastics. Industrialization would therefore be expedited by the manufacture of polyvinyl chloride which, besides its applications in making cable insulators, treating textiles and turning out floor tiles and various moulded articles - all important industries for Peru -, could be used to produce different types of tubes, especially those which are being increasingly used in modern irrigation systems. For similar reasons, it was also felt that a programme of industrial development might include installations for manufacturing 225 tons of DDT and 450 tons of BHC per year.

On the other hand, a study of the equipment and raw materials needed by the metal-transforming industry to achieve the output proposed led to the conclusion that many industries would require cast steel but very few of them in sufficient quantities to justify mechanized and modern installations, with all the components necessary for the technical control of operations. The situation with regard to forging is somewhat similar. Many of the manufactures suggested could profitably employ this process but probably none would justify, from the economic point of view, the installation of presses, particularly for heavy forging. These are two typical examples of operations which, as part of a rational policy of industrial development, should be centralized among a small number of establishments built for the specific purpose of serving the other industries.

Die-making for the metal-transforming industries would offer

/similar opportunities

similar opportunities for integration. As it requires highly skilled labour and precision equipment it could be carried on in centralized establishments. Individual factories would not then have to supply their own requirements. In any case, this is a wasteful procedure because most of them cannot maintain dies in constant operation. An even stronger argument is the lack of qualified technicians throughout Peruvian industry.

Industrialization - and import substitution too - might also be furthered by the integrated manufacture of vehicle spare parts. Industrial development institutes could give immediate consideration to this possibility as part of a programme for the gradual integration of the whole motor industry. A sound organization might comprise some degree of protection for the incipient industry in exchange for the observance of strict standards of quality and adherence to a specific industrialization programme calculated to ensure rational progress towards more economic techniques and installations. Later, it would be easy to adapt the factories in such a way as to enable them to supply certain parts to the assembly plants as part of a gradual "nationalization" of vehicle production.

A start might be made with relatively simple articles - gears, king pins, brackets for springs, petrol pump diaphragms, steering ends, clutch collars, radiators, exhaust pipes and certain rubber items, such as radiator hoses, engine brackets and fan belts. Subsequently, other more complex parts such as pistons, piston rings, connecting rods, cam-shafts and gaskets might be produced.

Possibilities of economic development as a whole

To sum up, the possibilities of aggregate industrial development during the period 1955-65 would signify an increase of 100 per cent in production, which is equivalent to some 17,000 million soles at 1955 prices. Within this increase the manufacturing share would represent 14,800 million (137 per cent) and the artisan share only 2,200 million (37 per cent).

The following manufacturing industries would stand out for their accelerated rate of growth: metal-transforming (427 per cent), chemicals (322 per cent), basic metals (266 per cent), steel furniture (238 per cent)

/and rubber

and rubber (225 per cent). The branches expected to achieve the largest volume of added production during the period under review are basic metals (3,230 million soles), foodstuffs (2,350 million), metal-transforming (1,700 million), textiles (1,540 million) and chemicals (1,430 million).

The fact that this study has considered a period of development between 1955 and 1965 in no way implies that it is believed or hoped that all the industries will have succeeded in attaining the levels proposed by 1965. The report has utilized a model showing a given type and rate of development but many others could have been constructed for attaining the same objectives. In the final analysis, the assumed increases might be applied, with certain adjustments, to another decade beginning after 1955.

The development proposed would remain within the limits necessary for imports of manufactured goods; they would not exceed 9,310 million soles in 1965. Nor would it cause the total foreign exchange requirements to exceed the figure of 11,600 million soles assumed for the economy as a whole.

The requirement laid down that development should help to modify the structure of industrial production in favour of intermediate and capital goods would actually be fulfilled because, within the total manufacturing output for the domestic market, the share of such goods would increase during the period under review from 28.9 to 36.6 per cent, while the proportion of consumer goods would fall from 70.6 to 63.3 per cent.

Labour, electric power and investment requirements

So far, consideration has been given to the possibilities of industrial development based on projections of demand and on the extent to which industry could or should satisfy it. The technical problems involved, the scale of production and, above all, the national interest were constantly borne in mind. It now remains to relate the various requirements of this development to Peru's ability to meet them.

As regards financing, Peru would have to invest an additional 14,600

million soles in industry by 1965. Added to the industrial stock of capital existing in 1955, this would give a total of 29,540 million soles, an amount slightly lower than that estimated at the beginning of the study. It was then assumed that the product-capital ratio of industry would remain constant (and equal to 0.41). The average depreciation of such a stock of capital (at the rate of 4 per cent per year) and the growth of the industrial gross product at a tempo reckoned at 6.5 per cent annually in 1965, would mean that by that year industry would require a gross annual investment of 3,100 million soles (at 1955 prices). Peru would therefore have to make quite a strenuous effort but it is undoubtedly equipped financially to bring it off since the figure quoted would represent 23.1 per cent of the gross investment for the economy as a whole. This ratio, compared with that of 19 per cent registered in 1955, represents a reasonable displacement of resources from other sectors into industry. Such a transfer would be fully justified by the changes to be made in the structure of the gross product in favour of industrial activities. Moreover, it will very probably be carried out without financing difficulties if, as is hoped, the changes in the organization and machinery of the capital market, as well as in the credit policy followed with respect to manufacturing industry, referred to in previous pages, are successfully put into effect.

It is hoped that the supply of electric power will not retard industrial growth. The national electrification plan includes projects for the expansion of generating capacity by 254 per cent in 10 years, while industrial needs would increase only by 119 per cent during the same period. This latter figure is relatively low in spite of the fact that the production increment assumed is large and that increased mechanization would result in an additional consumption of electric power per unit of product. To complete the comparison, the probable total demand for electric power for all uses would be some 5,500 million kWh. The satisfaction of this demand would require an increase in installed capacity of some 910,000 kW, a figure lower than that of 913,000 which represents the capacity added by the projects included in the national electrification plan.

/The industrial

The industrial development planned would secure the fulfilment of one of the conditions regarding manpower laid down for the achievement of balanced economic progress, namely, that by 1965 manufacturing industry would absorb an additional 100,000 workers. The aggregate needs of all industrial branches amounts to a total of 96,620 workers, in spite of the fact that the calculation was made with assumed or implicit increases in labour productivity equivalent on the average to 25 per cent during the period under review.

The most serious problem for industrial development is the shortage of skilled manpower. Peruvian industry would have to increase its supply of such labour by roughly 42,000 workers. Before 1965 it would therefore have to train a little over 50,000. A very rapid enquiry revealed that only 13,500 workers could become qualified during the period under review in workers' training centres and in women's vocational institutes, assuming that such establishments do not increase their present capacity. Industry would also have to employ an additional 4,000 engineers and technicians. In other words, it would have to train about 5,000. At the five Peruvian universities, with their present capacity, only 3,000 engineers and technicians could qualify before 1965.

This comparison between the number of qualified staff needed and the country's present capacity for training them gives an idea of the gravity of the problem. It might well impede Peru's industrial development if immediate measures are not taken to boost training capacity. Considering the effects on the Peruvian economy of any delay in industrial development, one of the most profitable economic investments which the country can and must make is to establish and amplify training centres for skilled workers and to grant additional facilities to vocational institutes.