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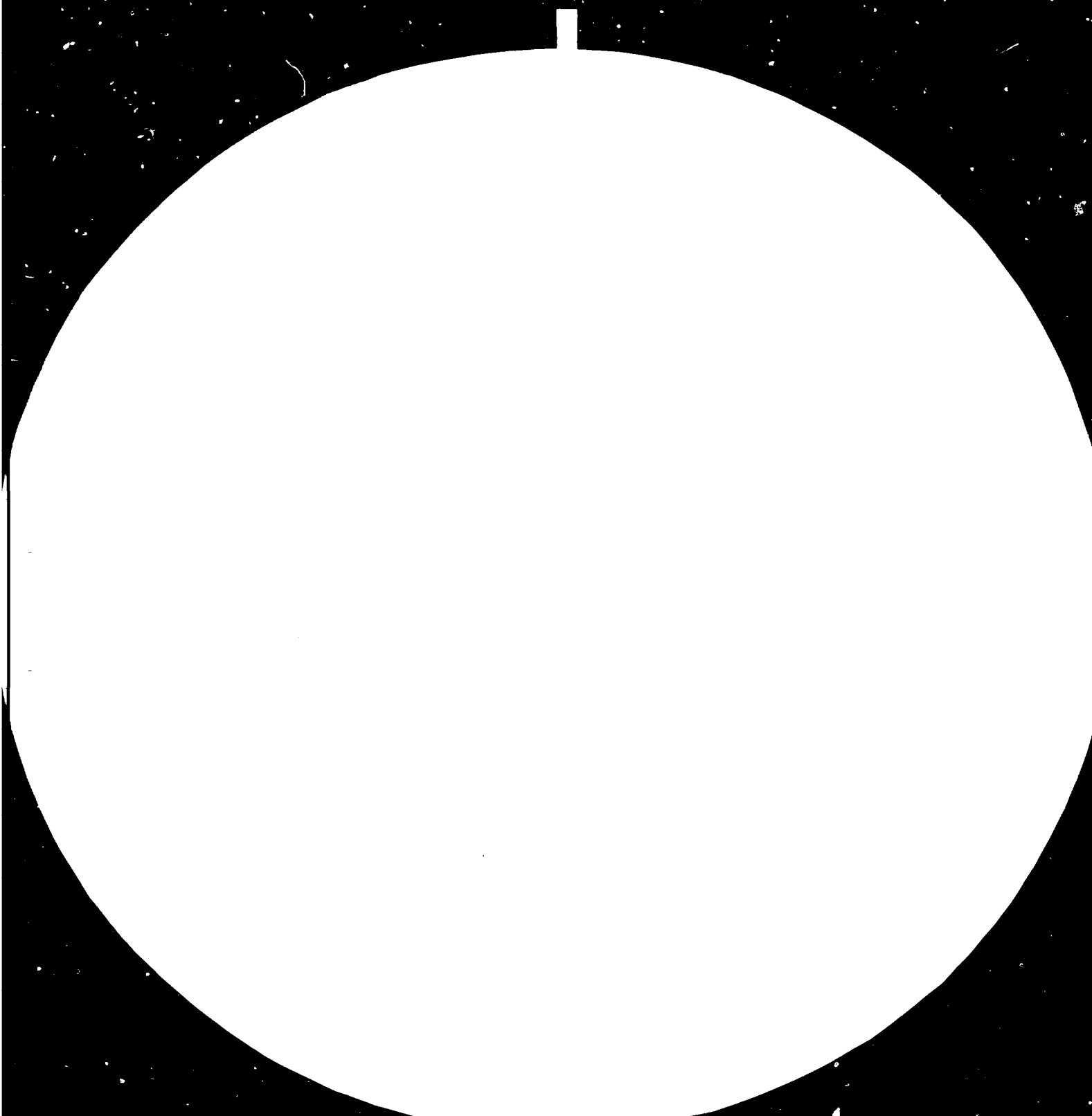

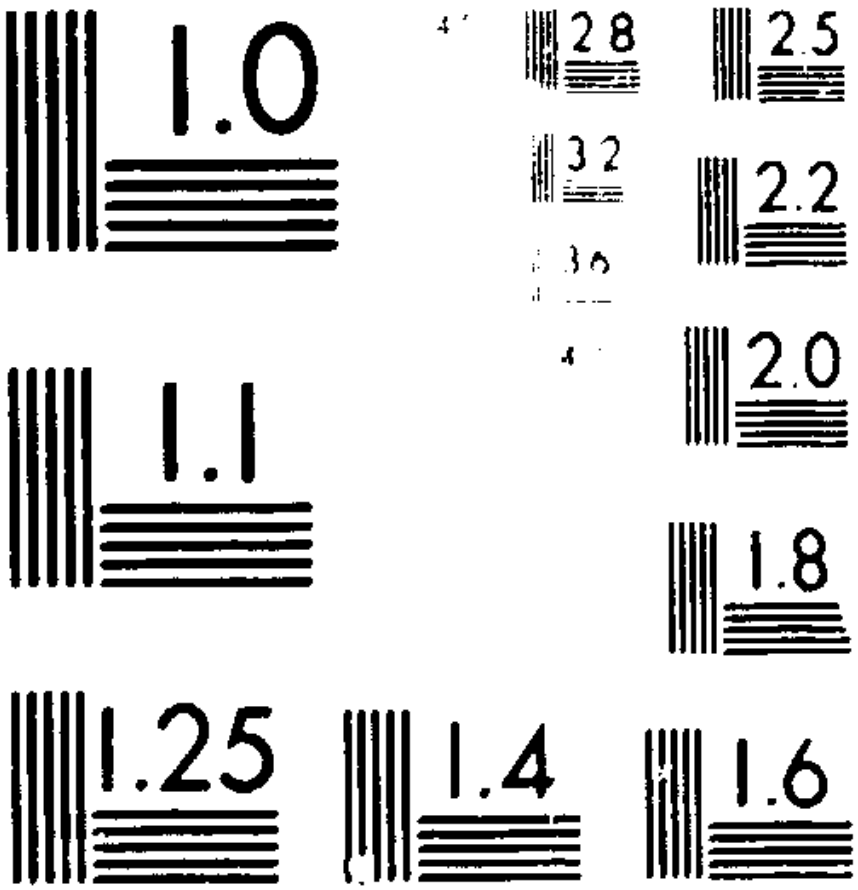
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ISSUE I

POTENTIALITIES AND POSSIBLE PROGRESS OF THE CAPITAL GOODS INDUSTRY DEVELOPMENT IN THE DEVELOPING COUNTRIES INCLUDING THE SMALL AND MEDIUM-SIZE DEVELOPING COUNTRIES *

Prepared by the Secretariat of UNIDO

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THE FIELD COVERED BY THE FIRST CONSULTATION ON THE CAPITAL GOODS INDUSTRY

1. Capital goods are not defined on the basis of their nature but according to the economic function which they perform, i.e. investment. In the market economy countries, national accounting defines capital goods as the durable goods constituting the fixed capital of the producing companies in an economy (excluding land and invisible assets), which therefore involves machines and equipment of all kinds (fixed or mobile) purchased by companies to form their productive capital.

In the centrally planned economy countries, capital goods form section 1 of social production, i.e. machinery and equipment, section 2 being the production of consumer goods.

2. These definitions need to be supplemented by other characteristics such as:

(a) the type of product and its technical nature;

(b) the degree of elaboration of the goods;

(c) the nature of demand[1/]

3. (a) The current nomenclature for capital goods is based on the technical function which each product performs. Thus the term "capital goods" is usually associated with products resulting from the processing of metals.

(b) The complexity of the capital goods industry stems from the existence of numerous conversion phases of the base materials or from the integration of components in the phases of assembly and erection resulting in a final product.

One of the essential characteristics of the capital goods industry, therefore, is that it constitutes a highly diversified system of integrated activities linked to each other through a close commercial relationship and technical and economic interdependence.

(c) The demand for capital goods is determined at two levels, namely that of means of production and that of final users.

The definition of "means of production" could be considered as manufacturing machines to produce machines. Although this is not an end in itself, it definitely serves final demand and is therefore influenced by it.

4. Capital goods can be differentiated from each other by the nature and the number of production sectors in which they are required. In this way it is possible to distinguish between capital goods intended for a single sector, those intended for several production sectors, and those common to all branches of the industry[2/].

5. In fact, there is no specific nomenclature for capital goods although an attempt has been made to classify them. Consequently estimating world production of capital goods is rather difficult. Subject to these reservations, however, world production of capital goods in terms of value added can be estimated at approximately $520 billion, or in other words about one-third of the world's industrial production[3/].

6. This order of magnitude lends a special significance to the First Consultation on the Capital Goods Industry. However it is not only the volume and value of the capital goods within the industrial production sector which makes them so important but also the key role that they play in the industrialization process.

THE KEY ROLE OF CAPITAL GOODS IN THE PROCESS OF INDUSTRIALIZATION

7. The importance of capital goods cannot be measured only by their share in world production. For example, the value of world production of machine tools is only about 1.5% of world industrial production. But it still constitutes a very important factor in the industrialization process.

8. The "mechanical" part in fixed capital plays a decisive role in the process of capital accumulation. In the industrially developed countries machinery and equipment constitute about 60 - 65% of fixed capital value in manufacturing industries, while in new investments their share is even higher — up to 75%. The countries which have chosen this strategy of rapid capital accumulation which encourages the growth of the capital goods industries expect a multiplier effect on industrialization. The preference given to the capital goods industries over the consumer goods industry aims at achieving long-term goals rather than immediate gains. The consequent slowing down of consumer goods production during the gestation period of the capital goods industry is the price paid for adopting this strategy[4/].

9. The second dimension of the role of capital goods is its ability to replace and modernize the production machinery. In other words the capital goods industry produces the means of production, the machines which make the machines.

10. The third role of capital goods is as a catalyst for technological progress. The practical result of this technological progress is machines and equipment[5/].

11. The creation of a capital goods industry is essential for avoiding a pseudo transfer of technology i.e. using the technology without assimilating it. Since the development of a capital goods industry involves mastering a wide range of technology and expertise, it permits the country to develop its own innovative genius rather than depend on imitating and copying others.

12. Lack of such innovation is the reason why the developing countries, with their abundant labour force and scarce capital, have not been able to develop capital saving technologies[6/]. Thus, if the desired policy is to use "appropriate technologies", it is imperative for the developing countries to set up at least an embryonic capital goods industry and facilities for research and development. The developed countries are not likely to concentrate on labour intensive techniques. Consequently such technologies can only be developed by the developing countries themselves.

SOME STRUCTURAL IMBALANCES

13. The absence of a capital goods industry is one of the pointers to a country's under-development. The inequality between the developing and the developed countries is evident from the fact that in 1977 the former contributed only 6% of the world production[7/] as compared to 66% for the market economy developed countries and 28% for the centrally planned economies[8/]. China's contribution appeared to be approximately 2.8%[9/]. Thus, the share of the developing countries, including China, would be of the order of 8.5%.

Even some of the more developed developing countries like Brazil and India are ranked only 12th and 26th respectively.

14. As for international trade, the developing countries supply only 2.5% of world exports, whereas their share in imports reaches 30%. The market economy developed countries provide more than 87% of exports with seven of these countries (Canada, the Federal Republic of Germany, France, Italy,

Japan, the United Kingdom, and the United States) accounting for three quarters of this amount. The centrally planned economies provide 10% of world exports.

Developed countries' imports from the developing countries are very insignificant - 2.3% of the market economy developed countries' imports in 1977. On the other hand, the developing countries import 92% of their equipment from the market economy developed countries, about 5% from the centrally planned economies and only 3% from each other.

15. Another important factor is capital goods consumption which in 1977 averaged $60 - $65 per capita for the developing countries. This is 24 and 21 times less than the market economy developed countries and the centrally planned economies respectively.

16. This deep seated structural imbalance is accompanied by other imbalances within the developing countries themselves which can be observed first of all in production. Argentina, Brazil, India, the Republic of Korea and Turkey contribute between 40 - 45% of the developing countries' production (excluding China). Hong Kong, Mexico and Singapore possess the base for these industries. 80% of machine tool production in the developing countries is concentrated in three countries; namely, Brazil, China and India.

17. A second group of countries is made up of those which are at the embryonic stage in the capital goods industry:- Algeria, Chile, Colombia, Indonesia, Iran, Malaysia, Pakistan, Peru, the Philippines, Thailand, Venezuela, the Central American countries, Egypt, Iraq, Ivory Coast, Sri Lanka, and to a lesser extent Bolivia, Cameroon, Equador, Ghana, Nigeria, Tanzania and Zaire.

18. The third group consists of 60 countries (actually 110 if one considers the 50 countries and territories with less than one million inhabitants) which have no capital goods industry and which rely mainly on agriculture.

19. These imbalances are also revealed by the nature of the products manufactured and the means of production. In numerous developing countries, assembly lines have been introduced in the manufacture of more complicated products such as tractors, trucks and other vehicles. However, the work is limited to merely assembling, resulting in a low value added and insufficient acquisition of industrial experience.

20. The small predominantly agriculture-based developing countries do not produce machines and equipment. However, some of them do carry out small scale production of spare parts and components for maintenance and repair. Although the existing capacities are minimal, they form a potential base for future development.

21. Small and medium sized developing countries have taken up the development of capital goods industries through the manufacture of simple agricultural machines, hand farm tools, animal drawn equipment, containers, boilers, pumps and spare parts and components for maintenance and repair.

22. Finally, some large developing countries produce a wide range of capital goods. However, their admission to the "industrial club" would now seem to depend upon their degree of technical mastery[10/].

23. There are also imbalances in the trade within the developing world, with most of the trading being carried out by Argentina, Brazil, Hong Kong, Mexico, India, Republic of Korea and Singapore[11/]. It should be noted that in some of these countries export is often carried out by branches of multi-national firms which have access to direct investment[12/].

24. With regard to imports, Algeria, Brazil, Iran, Iraq, Mexico, Nigeria, the Republic of Korea, Saudi Arabia and Venezuela had by themselves absorbed 40% of the imports of the developing countries in 1978. Seven of these countries are oil producing countries. If one adds Egypt, Hong Kong, Indonesia, Liberia, Libya, Malaysia and Singapore to this list, sixteen developing countries import almost 60% of the group's imports.

25. It follows that these imbalances also affect consumption of capital goods. Per capita consumption in the 60 essentially agricultural countries is 7-8 times less than that of those developing countries which have an industrial base (US$ 150 per capita).

26. The First Consultation on the Capital Goods Industry is expected to consider -

> How to balance production, trade and consumption in the capital goods industry between the developed and the developing countries (and among the developing countries themselves)?

STRUCTURAL CHARACTERISTICS

27. The essential characteristics of the capital goods sector are its complexity and heterogeneity, the international division of activities, the export of groups of capital goods via industrial complexes, and the relationship between investment costs and workers' qualifications.

28. The number of types of machinery and equipment has increased tremendously during the past decades and has by now perhaps reached a figure of about four million products. These machines are the result of the association of various production processes and technologies. There is a great heterogeneity within the technological complexity of technical goods[13/], which is also recorded by the industries' input-output tables. Capital goods require numerous inputs which increase with their complexity[14/]. The capital goods industry should, however, be considered in connection with the necessary infrastructure related to it. The structure of the industrial fabric - and its effectiveness - will depend upon the integration within the production of capital goods themselves of the "upstream" infrastructure and of the "downstream" users sector.

29. An intensified international division of labour is closely linked to the growing complexities of the sector and the increase in international trade. There is a considerable imbalance in the division of labour between the developed and the developing countries. Even those countries which have a diversified capital goods industry and also a surplus trade balance in capital goods are still not totally self-sufficient. Countries which are large producers and exporters of capital goods are also large importers, as is revealed by their import/consumption ratio[15/]. The case of machine tools is typical in this respect[16/]. In the case of centrally planned European economies, the division of labour and the corresponding specialization is governed by a systematic policy. The market economy developed countries, Denmark and Finland, have been able to specialize effectively and are each contributing 1% of the world's supply of capital goods; the former provides 10% of dairy equipment for farm use while the latter supplies 8.5% of machinery used in the manufacture of paper.

30. In some developing countries with a monoculture economy, a capital goods industry has been set up around this monoculture, e.g., the sugar industry in Cuba. In other cases, the narrow national market results in

attempts to specialize within the framework of sub-regional integration, for example the case of the Andean Pact countries.

31. It can be demonstrated (see Issue No.2) that the complexity of capital goods increases in proportion to the increase in the number of its component parts. Under these circumstances, international co-operation is an objective need within the framework of the dominant technology "patterns". This also explains one of the great changes in international commerce where trade in capital goods has become the driving force which the textile industries were in the past[17/].

32. An interesting development in international trade in capital goods during the last two decades has been the new trend of exporting industrial complexes which comprise a complete "package" of goods and services. It is difficult to judge the importance of this phenomenon which would seem to make up approximately 30% of world exports[18/]; 50% originated in Western Europe, 35% in the USA, 8% in Japan and 5% in the centrally planned economies of Europe.

33. This new type of international trade in capital goods would seem to be concentrated (around 60%) in the processing industries, i.e. petroleum, petrochemicals, chemicals, metallurgy, iron and steel, food processing industries and plants for energy production. There are both advantages and disadvantages to this type of industrialization. It reduces the costs and the construction delays by transferring integrated units, ensures the transfer of modern technology and management, may serve as a centre for upgrading manpower qualifications and skills, and creates a nucleus for further decentralization on the basis of specialization and sub-contracting. The disadvantage is that it does not encourage internal apprenticeships in industrial achievements and can inhibit the creative capacities of the national capital goods industry.

34. However, the trend in the coming decade would seem to indicate a change in the system of growth for the following two reasons:-

- the slower increase in the size of the installations;
- the tendency amongst the developing countries which have reached a certain degree of industrial maturity (e.g. India and Brazil) to open the "industrial and technological package" and to choose their imports as a function of their internal production capacities.

Mass industrialization of the developing countries along the lines of the Lima Declaration and Plan of Action would undoubtedly lead to market expansion because these countries would not have adequate resources for project design and implementation. This will introduce an element of forecasting and long-term planning.

35. The capital goods industry is generally not as heavy as other industries such as iron and steel or petrochemicals. The ratio of investment per worker in the machine tool industry for simple metal cutting machinery could range from US$ 15,000 - $ 20,000, and for machinery for metal forming from US$ 40,000 - $ 45,000 and US$ 55,000 - $ 65,000 respectively. In the USA the average cost of creating a job in the capital goods industry also ranges from US$ 40,000 - $ 60,000. As a result the relatively small amount of fixed capital investment per job created, as compared with other industries, favours the introduction of the capital goods industry as a source of employment in the developing countries. However, this conclusion needs to be viewed alongside the fact that the cost of the necessary infrastructure may be 3 - 5 times that of the direct investment[19/], and the price of equipment is increasing at a rate exceeding the rate of inflation, which results in increased investment costs[20/].

36. Lastly, compared to other industries the capital goods industry requires a more qualified labour force which is undoubtedly the main obstacle for the developing countries. Thus, to produce the simplest machine tools, workers with no previous technical training will need at least 1-2 years of practical training. Most workers will require up to 3 years of schooling and two years of practical training[21/]. Although the labour capital ratio is low, the investment needed to create the "human capital" through training is quite high.

37. Thus, out of 29 industrial sectors considered in the Federal Republic of Germany, the mechanical engineering industries occupied 17th position, the electrical engineering 22nd and the light mechanical engineering 25th as regards the ratio of physical capital per employee. When considering "human capital" per worker, however, these three industrial branches rank 7th, 8th and 6th respectively[22/].

38. Viewed from the standpoint of worker qualifications, structural differences appear not only between the capital goods sector and other industrial sectors, but also within the capital goods sector itself. The proportion of highly qualified personnel (technicians and engineers, people trained in commerce and administration) seem high for the sub-groups of capital goods industries -- electrical engineering is third in the 29 industries

analysed; mechanical engineering and light mechanical engineering are 4th and 5th respectively. In comparison, electrical engineering employs fewer semi-qualified workers (professional workers, foreman, supervisors) than the other two sub-groups. These sub-groups are 21st, 13th and 11th respectively. As regards less qualified personnel (manual workers), electrical engineering employs relatively more than either the mechanical engineering or the light mechanical engineering sectors. These three branches come 10th, 20th and 26th respectively.

PROSPECTS FOR THE DEVELOPING COUNTRIES AND THE CONSEQUENCES FOR OUTLINING NEGOTIATIONS WITH THE DEVELOPED COUNTRIES.

39. The analysis of imbalances and structural characteristics shows that the growth of the capital goods industry within the developing countries cannot be planned on a global basis, but has to be tailored to fit different situations. This means that a typology by groups of developing countries must be elaborated and the possible strategies for entry into, or growth in the sector, must be considered taking into account the various levels of complexity of machinery and equipment. (See Issue No.2).

40. The forum provided by the Consultation should enable the progressive identification of future projects for the countries concerned. A most realistic approach for planning alternative scenarios would be to obtain information on the projects envisaged for implementation[23/]. More accurate information on the projects and the market sector are prerequisites for avoiding any confusion, for reducing conflicts and for strengthening international co-operation.

41. It is therefore suggested that the First Consultation on Capital Goods consider whether, after the present situation has been fully analysed, more attention could be focused on the future and on setting up the required mutual information service on projects in both the developing and the developed countries. Such an exchange should enable the establishment of a permanent dialogue through the System of Consultations.

42. The identification of projects to establish or expand the capital goods industry will obviously encounter various difficulties. In the developed countries such projects are more numerous and are spread throughout the heavy industries sector (involving for instance iron and steel and petrochemicals). In the least developed countries, however, there are very few such projects and in the case of some of them practically no information is available. The

greatest difficulty arises from the future market uncertainties resulting from the economic recession in the market economy developed countries with its influence extending further to the centrally planned economies as well as the developing countries, particularly the non oil producers.

43. A comparative analysis of the GNP growth rate cycles for the years 1972 - 1977[24/] for manufacturing industries, for group 38 (ISIC classification) which includes capital goods, and for group 371 dealing with the iron and steel industry[25/], shows that for the developing countries, if the iron and steel cycle seems relatively active, that of mechanical industries is the least active of all. This is not the case in the market economy developed countries where the mechanical industries continue to be the driving force behind growth and can claim a higher growth rate than the intermediate iron and steel industry. A more detailed analysis of the developing countries shows that the more industrialized they become, the more their behaviour approaches that of the developed countries.

44. The assumption that the recession will continue throughout the present decade cannot be excluded a priori and the resulting trend in the development of the capital goods industry in both the developing and the developed countries must be examined. The First Consultation could exchange ideas on the subject and could also consider the problem in reverse i.e. to what extent can a vigorous surge in the demand for capital goods in the developing countries contribute to defeating the stagnation of various industries in the countries affected by the recession? A slower growth, a shifting of the crisis cycle within the realm of means of production and the current restructuring of many industries in the developed countries would probably make it more difficult to redress the balance within the capital goods sector to the advantage of the developing countries. Yet at the same time these circumstances could also lead to an increased investment in the developing countries.

45. There are several possibilities which need to be explored, but this must go beyond "naive extrapolations"[26/] based on past trends, which visualize the future as a reflection of the past making the future unique, predetermined and continuous. The proposed method differs from simple forecasting in that it considers not only the future to be faced, but also the future desired.

46. Given the lack of alternative scenarios which are dependant on obtaining information on the projects, the UNIDO Secretariat has made an attempt to establish "images" of possible future developments using the world industrial input-output model[27/]. This model is normative as regards the future and

simulative in respect of the past (it "reproduces" past relationships). The result is normative projections, which are not to be confused with forecasts and scenarios. The model does not forecast how the growth rates of the developed and the developing countries will evolve, but rather what they should be according to the various growth hypotheses so as to attain the goals of the Lima Declaration and Plan of Action.

47. Two hypotheses, a maximum one (1) and a minimum one (2) have set the growth rate of gross domestic product (GDP) in the developed countries for the period 1970-2000 at 4% and 2.6% respectively. With regard to the mechanical and electrical industries, the following results have been obtained:-

- production in developing countries will increase at a rate of 11.2% for hypothesis 1 and 9.8% for hypothesis 2;
- consumption will increase at a rate of 10.5% and 9.0% respectively;
- according to both hypotheses local production in the year 2000 will cover 55% of consumption as compared to 45% in 1970;
- both hypotheses show the developing countries' share in world production varying between 16.7% and 16.9%.

48. Thus, in both cases, the Lima target of 25% (which did not mean 25% for any specific sector) would not seem to be achievable. These results correspond to those obtained by UNCTAD [28/], and are close to those in the OECD "interfutures" scenarios[29/], where the developing countries' share in world production of capital goods amounts to 12% (if China were included this figure would be 16% - 18%).

49. The UNIDO Secretariat has investigated the normative projections for groups of countries using the second (minimum) hypothesis (taking the average annual production growth rate in the developing countries as 9.8% with a demand growth of 9%, while at the same time keeping in view the variations in this average amongst groups of countries). The first hypothesis was composed for all the countries with a budding industrial base which can improve their position in industry. It estimates that in the year 2000 AD these countries would account for 22% of production in the developing countries as compared to 15.5% in 1977. During this period the percentage of their demand which they could meet themselves would have risen from 30% - 43%. The second hypothesis concerns the poorest agriculture based countries which are expected to improve their general position by the year 2000 AD, but would still not

account for more than 3% of the developing countries' production and only 6% of consumption. Their own production would cover only 20% of their consumption needs. These mathematical exercises should presently serve to set upper and lower limits for future possibilities and give a guide to the orders of magnitude.

50. Achieving the Lima target of 25% and 15% of the world capital goods production by the year 2000 (as compared with 6% now) would require a basic change in the world's economy. In assessing this change, it should be noted that capital goods production in the developing countries in the year 2000 AD would represent 78% of the developed countries production in 1970 at the most. The minimum hypothesis indicates a figure of 52%. In the first hypothesis developing countries' consumption in the year 2000 would be 1.5 times that of the developed countries in 1970. In the second the figures would be equal. Again, in the first hypothesis, net imports will need to be multiplied by 16, while in the minimum hypothesis this multiplier would be 10. In both cases this would imply the emergence of a huge market for the developed countries. Net exports from the developed countries in 1970 represented less than 20% of their production. According to the maximum hypothesis, this figure will rise to 60% of their 1970 production by the year 2000 AD, whilst the minimum hypothesis puts this figure at 42%. In both cases this would result in an enormous market being opened up for the developed countries.

51. Industrialization of the Third World can, in the immediate future, become a driving force in the world's economy. Bearing in mind the immensity of demand, the foreseeable increase in the developing countries' production would be sufficient to cover only about 55% of their consumption in the year 2000. Under these circumstances, the relationship between the developing and the developed countries would not be one of competition only, since the developing countries cannot become self-sufficient in capital goods production by the year 2000, either quantitatively or qualitatively. However, they should be able to produce an increasing share of these goods.

52. Another implication of the above hypotheses concerns the unemployment problem. The contribution of industrialization in absorbing unemployment in the developing countries depends, to a great extent, on the growth of the capital goods sector.

53. The developing countries are likely to import machinery and equipment in massive quantities in the hope that these would be more efficient and more economical in the use of the labour force, intellectual activities, and

repetitive operations. If such a transfer of activities does not benefit the capital goods sector as well as achieving other important social objectives, the industrialization fostered by the supply of equipment from the developed countries will not be making any significant contribution to solving the problems of employment.

54. If there is no capital goods industry to link up with the consumer industries, the only alternative for the developing countries appears to be to resort to completely integrated production in major industrial centres[30/] within all its productive, commercial, and financial circuits. The trend towards an international division of labour of this kind can be observed at the moment; it employs part of the non-qualified labour force in the developing countries. This would make for even greater world interdependence and exacerbate the weak position of developing countries in today's interdependent world. This is therefore a possible path but is not the one envisaged by the new international economic order.

55. The struggle against imbalances in trade and employment in the developing countries makes it doubly necessary for the developing countries to produce and export capital goods. The First Consultation needs to bear this in mind as it will raise the following basic questions for international negotiations:-

- what types of capital goods can be produced in the developing countries and in what period of time?
- what types of capital goods could eventually be exported by the developing countries and to which areas?
- what are the areas of friction where the interests of the developing and the developed countries conflict?

56. In the absence of correct sources of information on the projects, the First Consultation may not be in a position to answer these questions fully. But it may be able to take certain steps toward finding the answers. For example the following could be considered:-

Some developing countries are presently competing with the traditional producers by exporting simple machine tools.

- What are the prospects?
- Are the developed countries still interested in continuing large scale production of these categories of capital goods?

- In general terms, what concessions within the new international division of labour are the developed countries willing to make in return for the new markets which will be opened up by the industrialization of the developing countries?

(The above questions could be posed for other products too, e.g. textile machinery).

STATE INVOLVEMENT IN NATIONAL PLANNING AND CO-OPERATION

57. In the developing countries a prerequisite condition for the development of the capital goods industry is the existence of a system of industrial planning. The capital goods sector is central to the industrialization process and therefore requires careful State planning. This observation is not one of philosophical preference, but is based on necessity. The industrial fabric is determined by long-term choices concerning the means of production and their integration[31/].

58. One basic aspect of joint planning of supply or demand for machinery and equipment in the developing countries needs to be emphasized, especially in the case of the countries which have the nucleus of a capital goods industry. Mass importing of equipment, particularly complete installations, can limit the mobility of the infant local capital goods industry. For this reason one of the basic functions of planning is to inject funds into the project so as to preserve this indispensable flexibility and protect the local capital goods industry. This policy has been followed by certain developing countries[32/] with varying degrees of success. Obviously, it requires a high level of expertise which is not available in several countries. Such a policy however can be adopted through organizational set ups incorporating, for example, the national engineering capacities, and bypassing the bureaucratic hurdles[33/].

59. Assistance in planning can be the first practical step for industrial co-operation and here UNIDO can play an important role.

60. The second important factor is that both the developed and the developing countries have to recognize the role which the State is to assume in the capital goods sector. Industrial co-operation lies within the general area of inter-State relations and, therefore, individual Governments have to determine development priorities[34/].

61. The risks encountered by the foreign investors in the developing countries have often been stressed, in particular the risks of expropriation of nationa-

lization that exist despite efforts to minimize them through industrial arrangements. However, there has been less emphasis placed on the risks that are faced by the developing countries, and these are as real as the fears of the foreign investors. In a period of active industrial restructuring characterized by a continual string of takeovers, mergers and even the closure of enterprises in the market economy developed countries, instability in one of the partners can cause serious problems for the developing country. The appearance of a new company as a partner and the strategy it adopts vis-à-vis the host country may differ considerably from that of the initial investor or licensor, and the difficulties that arise can adversely affect the still fragile capital goods industry established in the developing countries[35/]. The developed countries need to be aware of these problems. When there is a change in partners, problems may also arise with the transfer of warranties at the State level or with their stability over any set period of time.

62. In the case of the centrally planned economies, the State is directly involved in commercial transactions and in technical assistance for industrial operations. In the market economy developed countries, the State is generally no more than a sleeping partner which supports its enterprises' export activities in various ways. Sometimes it also assumes responsibility for the risks[36/].

63. The Governments of the developing countries are automatically involved in setting up projects in the capital goods sector. In a number of cases, viability in the short and immediate term is not assured because of the type of investment, the establishment of the necessary infrastructure and the required training. Private entrepreneurs, if there are any, are not likely to risk investing in these activities, and the State, therefore, has to provide the incentive, handle general organization and in particular guide the educational system and technical training. It is obvious that an uncoordinated policy for development of capital goods runs the serious risk of failure and, therefore, State intervention is essential.

64. In the developed countries the State could intervene in order to strengthen industrial co-operation with the developing countries. The capital goods sector is a heterogeneous one, sometimes dominated by large enterprises which have a monopoly or oligopoly, sometimes split up among numerous small and medium sized enterprises which quite often are active and innovative. However, these small and medium sized enterprises do not enjoy the freedom of movement necessary to branch out into intercontinental operations, and so

their participation in industrial co-operation thus requires organization and support from public sources. Novertheless it is more convenient for the small and medium sized developing countries to work with small and medium sized enterprises from the developed countries rather than the large ones. This type of co-operation is not easy and does not become established spontaneously.

65. Consequently one arrives at the idea of structural bilateral or multilateral co-operation within the sector, the long-term arrangements for which could constitute one of the modalities envisaged among the instruments for co-operation.

66. The abovementioned comments suggest a methodology for action to lend coherence to the discussions in the First Consultation on Capital Goods, and implies the following:-

(1) As a first step it would be desirable to agree on certain essential criteria for the capital goods sector namely its identification, its structural characteristics, recognition of the present imbalances and the need to correct them.

(2) "Technology in the service of development" relates an analysis of the sector's technological complexity to strategies to be adopted by groups of developing countries in order to enter the sector. The main emphasis is to be placed on the small and medium sized countries which at present possess a weak or practically non-existent technological base in this industry. This, however, does not mean that the problems of the larger developing countries which already possess an operational capital goods industry are to be ignored.

Consequently, it appears necessary to forge new planning tools which will complement the existing ones and help in the establishment of capital goods projects. The suggested method of analysis of technological complexity would be one such tool which could be useful for the developing countries[37/]. The guidelines provided by this Consultation should allow a better analysis of the problem and permit the adoption of a less global approach more inkeeping with regional realities.

(3) The Lima Declaration had envisaged a mass transfer of industries to the developing countries. If this is to become a reality, adoption of the concept of industrial co-operation through a system

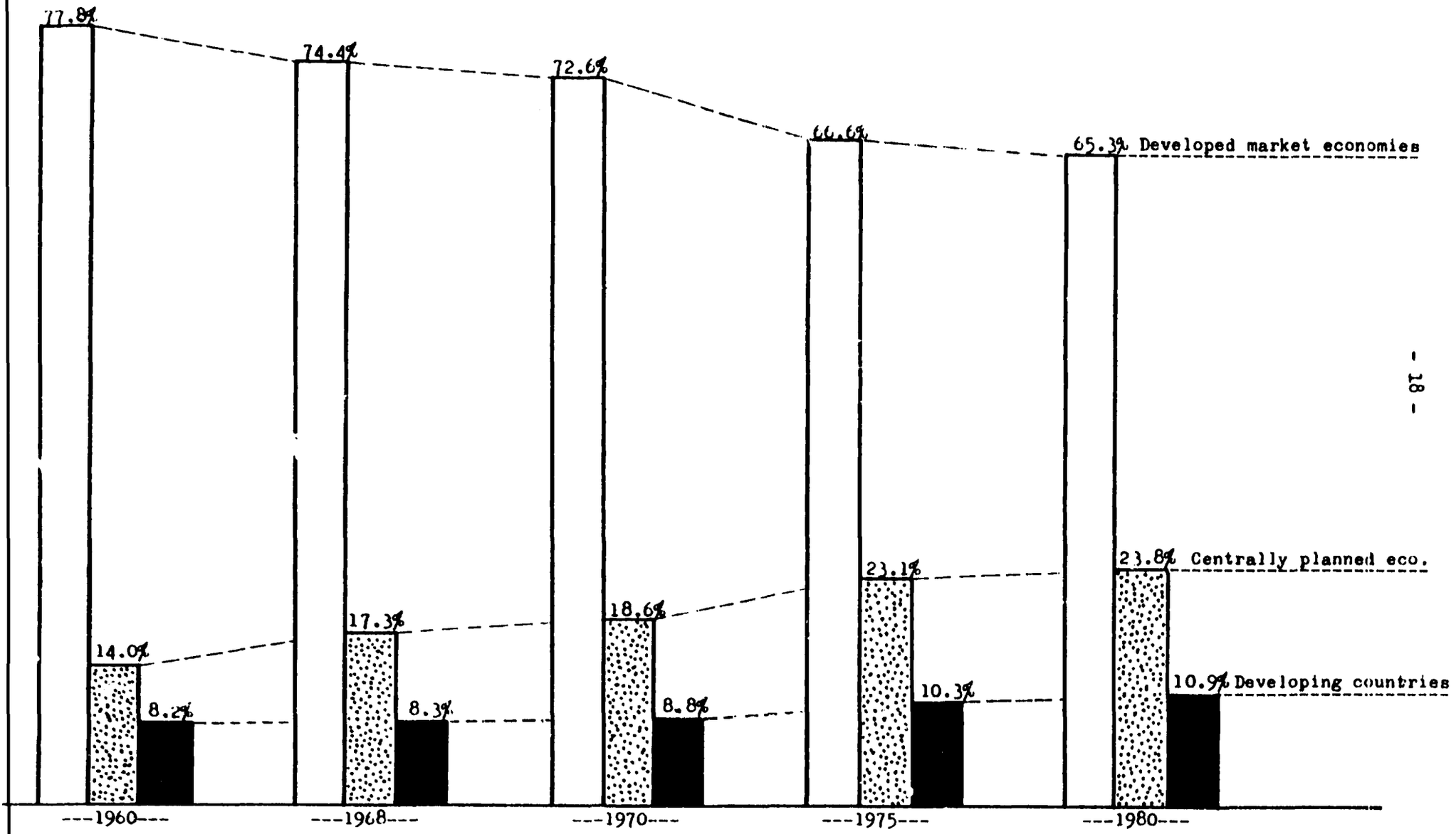
of long-term negotiations will be absolutely essential. This Consultation should be able to provide necessary guidance on this complex issue of international co-operation.

Graph 1

Structure of World Manufacturing Value Added by Economic Groupings

1960-1980

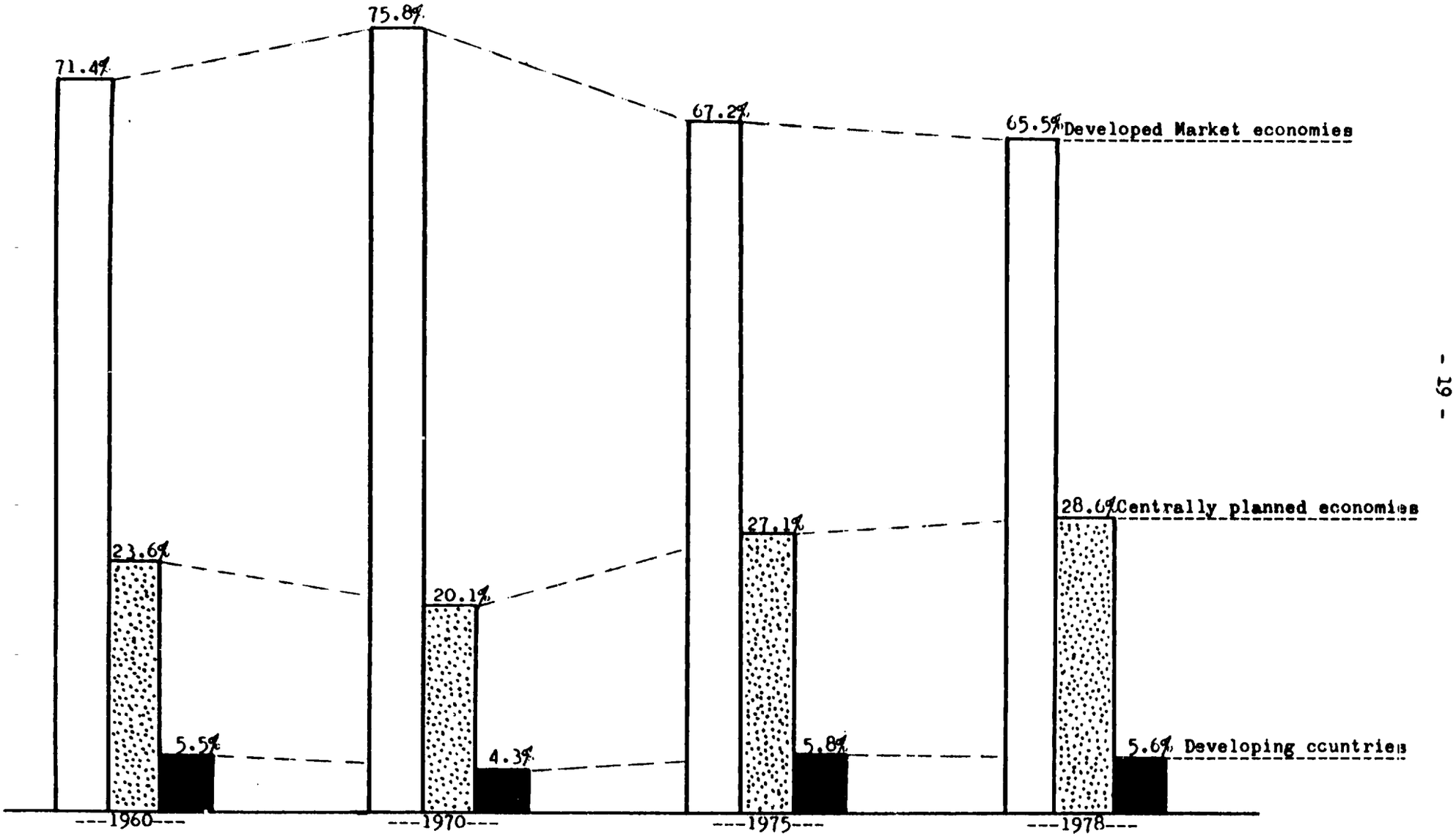
%



Graph 2

Structure of World Production by Value Added (ISIC) 38
by Economic Groupings and 1975 Constant Prices

1975 = 100



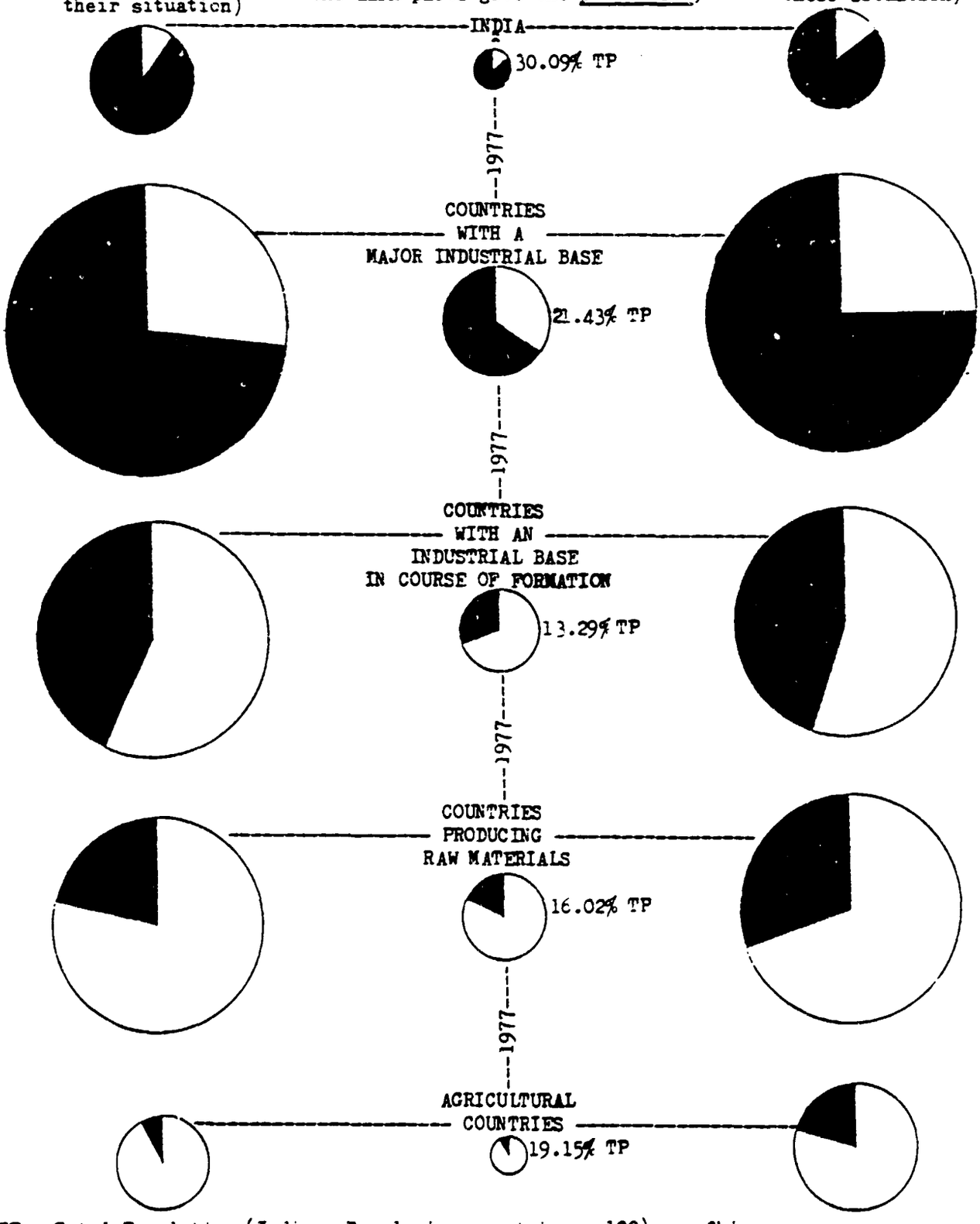
Graph 3

ALTERNATIVE PICTURES FOR THE YEAR 2000 BY GROUPS OF DEVELOPING COUNTRIES

2000
ALTERNATIVE I
(The poorest countries "do not improve" their situation)

(The area limited by the circles give the consumption of capital goods and the dark parts give the production)

2000
ALTERNATIVE II
(The poorest countries "improve" their situation)



TP = Total Population (India + Developing countries = 100) ex. China.

Scale: For INDIA the consumption for 1977 was around 9 billions US dollars.

N.B.
Original values in constant US dollars 1977

Note: The main difference between the two alternative comes from the relative position of the poorest countries, i.e. the last two groups of (raw materials producer and agricultural) countries which improve their consumption and their self sufficiency: Production/Consumption for the year 2000.

Notes on Issue I

1/ The reader who would like a more detailed account of the definition of capital goods should refer to the reference study "Summary of the world-wide study on the capital goods industry: Progress, potentialities and entries, elements of strategy and international co-operation" prepared for the First Consultation.

2/ The economic importance of capital goods common to all branches of industry is extensive since it represents approximately 40 per cent of the value of all capital goods. It is difficult to determine its boundary with the preceding category. Its technical characteristics may vary for one single type of product, according to which branches of industry it is meant for.

3/ This estimate was made according to OECD statistical data ("Livraisons de 100 produits industriels". Les industries mécaniques et électriques dans les pays membres de l'OCDE, 1973-1976, Paris, 1978). Overall production of mechanical and electrical goods seems 20 per cent higher than the evaluation of the final value of capital goods.

4/ K.R. Paramesvar (Executive Director - Bharat Heavy Electricals Limited, New Delhi): Development of capital goods sector in India/UNIDO's Global Preparatory Meeting for the First Consultation on the Capital Goods Industry - 24 to 28 November 1980.

5/ The correlation "r" is significant between an existing capital goods industry and national invention as measured by the requests for registration of patents in a country by a national of that country. See P.F. Gonod: "Transfert des industries et dépendance technologique dans les pays en développement" - Mondes en Développement No.23, 1978.

6/ Nathan Rosenberg, Professor Economics, Stanford University: Perspectives on Technology - Cambridge University Press, 1976.

7/ Not including Albania, China, the Popular Republic of Korea, and Vietnam.

8/ The reader's attention is drawn to the relativity of present estimates gathered from available statistics. For example, with a structure in current prices, the respective shares in world production in the sector of the three main groups considered were as follows:

	1963	1970	1975
Market economy developed countries	66.6%	65.6%	67.2%
Centrally planned economy countries	30.6%	31.0%	27.1%
Market economy developing countries	2.8%	3.4%	5.8%

For the year 1970, as a comparison, the respecitve parts vary when they are quoted a) at 1963 prices b) at 1975 prices. The results for both are as follows:

	a	b
Market economy developed countries	60.0%	75.8%
Centrally planned economy countries	36.7%	20.1%
Market economy developing countries	3.2%	4.3%

Thus, the change made in the year of the monetary deflector produces important variations in the results which, namely, tend to overstate the results for market economy countries where inflation is high. Therefore, one should only consider the order of magnitude that they suggest.

9/ The statistics of production of capital goods in China are gross production figures. In 1979, production was 122 billion dollars. The value added being estimated at 30 per cent of the latter, would give 19 billion in 1975 dollars.

Calculations made in the study "Development of capital goods industry in China".

10/ The existence of a hard core of manufacture was brought to light in the analysis of Indian experience on entry into the iron and steel industry. This hard core concerns the heavy and sophisticated types of electrical equipment, high performance mechanical equipment, measuring, regulating, control and catalyst equipment and generally all equipment which helps modulate and control a system. This hard core constitutes a high stake: for the countries which manage to integrate it and cross the border, it opens the door to international competitiveness and exportation. See "Introductory Document" prepared by the Sectoral Studies Branch, Division for Industrial Studies, UNIDO, for the Seminar on Strategies and Instruments to Promote the Development of Capital Goods Industries in Developing Countries, Algiers, 7-11 December 1979.

11/ Singapore and Hong Kong are exceptions, their production being strongly oriented toward external trade often give the aspect of import-export operations.

12/ "The New Industrial Countries and Their Impact on Western Manufacturing" by Anthony Edwards - The Economist Intelligence Unit Ltd. - EIU Special Report No.73 - 1979.

13/ This basic characteristic is the starting point for Issue No.2 submitted to the First Consultation on the Capital Goods Industry.

14/ Thus, an analysis of the input-output tables concerning the United States of America reveal that the manufacture of machine-tools to cut metal requires direct inputs from 47 industries, 56 if one takes the

necessary infrastructure into consideration (according to the two digit standard industrial classification). For agricultural machinery, this gives 31 links. S. Elekoev - Senior Research Staff - Institute of World Economy and International Relations, Academy of Sciences, Moscow, USSR: Economic aspects and social consequences of the development of the capital goods industries in developing countries. Global Preparatory Meeting for the First Consultation on the Capital Goods Industry - Warsaw, Poland - 24 to 28 November 1980.

15/ See "Les biens de capital dans les pays en développement - situation actuelle, perspectives, éléments et stratégie" - IREP Grenoble/UNIDO May 1980.

16/ Except Japan

17/ See G. Mistral - International Division of Labour - in: Vers une nouvelle division internationale du travail? - Revue d'économie industrielle - 4th quarter 1980.

18/ EURO Economics: Exports markets for industrial complexes - present position and future prospects - Eurofinance, April 1978.

19/ S. Elekoev: op. cit. 14/

20/ See the study "1990 Scenarios for the iron and steel industry" - Part I, Dossier E, the cost of the projects. UNIDO/IS.213 - 23 February 1981.

21/ Research Institute of Engineering, Technology and Economy - Prague, Czechoslovakia: Study on "Machine Tools Industry" - UNIDO, 1980.

22/ Gerhard Fels: "The Choice of Industry Mix in the Division of Labour between Developed and Developing Countries - Institut für Weltwirtschaft, kiel, 1971.

23/ See "1990 Scenarios for the iron and steel industry", Part I: op. cit. 20/

24/ Statistics being incomplete, the years 1978, 1979 and 1980 have not been included.

25/ See "1990 Scenarios for the iron and steel industry", Part 2: Proposals for the scenarios - UNIDO/IS.213/Add.1, 23 February 1980.

26/ Robert U. Ayres: "Prévision technologique et planification à long terme" - Hommes et techniques, 1972.

27/ LIDO - Lima Industrial Development Objective.

28/ UNCTAD/IV.TD.185 Supp.1 - May 1976.

29/ Interfuturs - Face aux futurs - Pour une maitrise du vraisemblable et une gestion de l'imprévisible. OECD, Paris 1979

30/ Peter F. Druker in his recent book "Managing in turbulent times" introduces new concepts and hypotheses which result in a view of international division of labour, the philosophy of which differs from the view approved by United Nations resolutions. He believes that production sharing will be the predominant factor by the end of the century; we have "neither theories, nor concepts nor measurements" for production sharing, but it challenges traditional concepts of overseas trade, national economies and products, and of all these factors taken together. From now on we see "transnational integration" which is not the same as "production internationalization". Unlike the latter the first does not necessarily require a very extensive multinational enterprise but rather a "transnational confederation" where the multinational company would be a marketing rather than a manufacturing company, and would be capable of making quick changes in direction. The cohesion of the enterprise would depend more on its control of marketing than on its control of capital. He is of the opinion that "production sharing" is the best hope - perhaps the only hope - which the majority of developing countries have of surviving the catastrophe of an explosion in the number of young people reaching working age and seeking employment". The multinationals must provide manufacturing work. Work requiring more sophisticated technology and management will be performed in the industrial countries. This proposal is based on a technological prediction according to which "the modern manufacturing technology of the 20th century, the production line, will have largely disappeared in industrialized countries well before 1995, and will have been replaced by true automation. Only the developing countries will continue to use this technology". The multinationals are the access channel for the markets of the industrialized countries. The author is aware that the greater dependence of developing countries on the new transnationals will steadily create serious political tensions in the developing countries. However, he believes that it is already a fact that "there is no longer a place for soverignty in an interdependent economic world".

31/ This is why UNIDO has given a particular importance to the planning of this sector and has undertaken pilot actions in some countries, inter alia, in Mexico.

32/ In Argentina, for instance, where it was possible to incorporate 45% of national components in a first atomic power plant. See: Jorge A.Sabato and Oscar Wortman "Apertura del paquete technologico para la Central Nuclear de Atucha", OEA, January 1974. On the "Brazilian filters" policy, see: Presidency of the Republic "Basic Plan for Scientific and Technological Development 1973-1974" June 1973; A.C. Bandeira and G.R. Coarcy "A renovacao do sistema da propriedade industrial no Brasil", PPTT - OEA, 2 May 1973. On the policy of the Andean Pact, see: Junta del Acuerdo de Cartagena, Grupo de tecnologia "Desagregación del paquete tecnológico" - 14 March 1974.

33/ On the institutional mechanisms, see: "The technological self-reliance of developing countries: Towards operational strategies" UNIDO/ICIS.133 15 November 1979, and Pierre F. Gonod: "Les mécanismes organisés nationaux du transfert technologique" - Communication au 1er Congrés Pan-américan sur le transfert technologique, 19-25 October 1980, Mexico.

34/ Albert Coppé, Professor of economics at the Catholic University of Louvain (Belgium); Domingo Sugranyes, General Secretary of the International Christian Union of Business Directors (UNIAPAC), Brussels: Entreprises Travaillant dans les pays en voie de développement et contrats de solidarite, dans "Vers des contrats de solidarite"- Travail et Société - Institut International d'Etudes Sociales, Genéve - July 1978.

35/ See for example: Dominating position of transnationals in "Le marché international". Monographe on the electricity industry. R.S.New Farmer - UNCTAD/ST/MD/13 - Conséquences pour les pays en développement des pratiques commerciales restrictives des sociétés transnationales dans l'industrie de l'equipement électrique: Monographie sur le Brésil". Etude redigée par B. Epstein et K.R.V. Mirow - UNCTAD/ST/MD/9.

36/ This is how the Belgian Society of International Investment was created in the country hosting the First Consultation on Capital Goods. This society is a joint venture by public and private sectors. In fact, it completes at the permanent funds level the Belgian financial apparatus to meet the increasing needs of foreign countries and, in particular, of developing countries. Albert Coppé and Domingo Surgranyes: op. cit.34/.

37/ Testing this method and its operational adaptation must be carried out for the first time in Algeria.