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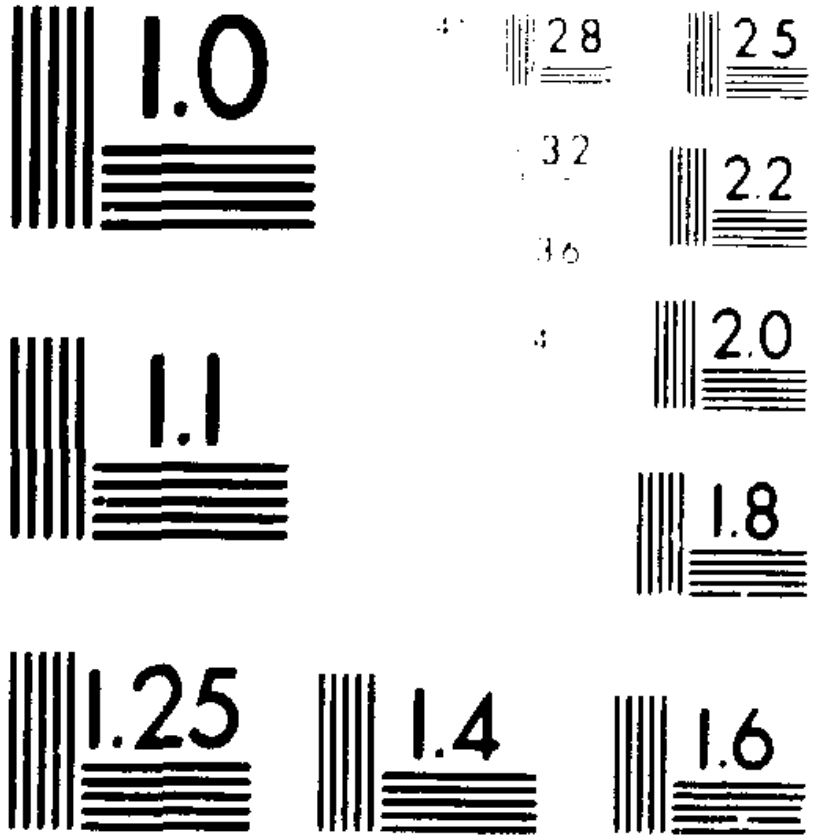

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UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

INDUSTRIAL PLANNING SECTION
DIVISION OF INDUSTRIAL OPERATIONS

PARTS OF THE SECOND DRAFT OF THE "GUIDELINES ON INDUSTRIAL PLANNING IN DEVELOPING COUNTRIES"

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CHAPTER I

INTRODUCTION TO INDUSTRIAL PLANNING IN DEVELOPING COUNTRIES

Plan of Chapter I

The Concept of Industrial Planning

The term "development planning" is often given different meanings in various textbooks and studies concerned with the problems of economic planning. Most of them view planning as a subjective process, in which the government direct the economy to influence the rate of growth. Occasionally, the word development planning is used to refer to any governmental activity intended to regulate some aspects of the economic life. It is true that development planning presupposes a government control on economic activities, but it is certainly more than this. Attempts to regulate the economy by the government reflects the need for planning, but it does not necessarily means the possibility of successfully implementing national plans or of substantially benefiting from them. A review of trends, problems and deficiencies arising out of past planning experiences in developing countries demonstrates that the great majority of them have by far failed to realize a real sustained growth. Even those countries which have a relatively developed planning and statistical apparatus, as well as planning traditions were not all able to overcome crucial problems, such as poverty and unemployment. This is, of course, due to the political and social objective conditions prevailing in these countries but also to the deficiencies in their planning process.

The fact that socio-economic development under the current circumstances of the large majority of developing countries cannot occur spontaneously, or by introducing some policies to regulate some aspects of economic activities by the government; calls for introducing principles of planning in developing countries which reckon with the objective behaviours of different social forces and economic laws, and attempt to combine the main economic variables in a way to achieve voluntary and realistic objectives during the designated plan period. Ignoring the objective aspect of economic factors in the plans usually causes further complications and bottlenecks within the national economy. For example, failure to relate investment expenditures to resources during plan implementation leads to unbalances and bottlenecks which ultimately have a depressing effect on the economy, with the resultant weak rate of growth.

The identification of the objective aspects of soical and economic factors is of great significance for regulating the complexity of the process of production on the basis of a conscious determination of proportions in distributing labour force, financial and material resources among the individual spheres and sectors of the national economy.

Definition of Development Planning

Taking these considerations into account, we can define "development planning" as a conscious activity exercised by the society and organized by the government in complete compliance with exante identified objective behaviours of the main social and economic factors; with the aim to guide the national economy toward a steady and optimum socio-economic progress in the long run, in order to increase the level of satisfaction of the needs of the major groups of the population; on the basis of rational allocating the country's labour, natural resources, fixed assets, materials and energy.

Industrial planning, is, in fact, the part of this activity which focuses mainly on the development of the industrial sector and its linkages with the other sectors of the national economy. Defining the process of industrialization as the progressive transformation of all socio-economic structures due to the introduction of a coherent sets of machineries and modern technologies, we can define industrial planning as all social procedures required to organize and intensify such a process of industrialization.

The Scope of Industrial Planning 1/

The comprehensive national planning process deals with various levels of planning problems, e.g., with the economy as a whole, with particular sectors of economic or social activity, and with sub-sectors or branches therefore. The first of these levels involves the study of broad economic problems and goals, such as economic growth, population and income distribution. These problems and goals are normally set by a national economic plan.

Sectoral planning encompasses both productive economic and social activities. For example, the industry as a whole, specific industry groups and branches, commerce, communications, agriculture, housing, soical facilities and other soical and material services. For planning purposes, some of these sectors are subdivided to permit more explicit analysis of sub-sectoral problems.

The national plan provides the perspective for the industrial sector plan and sets the directions towards which the industrial sector has to move. Devoid of the base of a national plan, the industrial plan will not have rationally delineated terminal goals to serve, which are the ultimate objective of any socio-economic planning system. Even the

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1/ The present guidelines are basically confined to the sectoral planning for the manufacturing industry.

best and fastest programme of industrialization could create significant economic and social unbalances and hence fail to ensure the development of the country if it is not planned in co-ordination with the other economic and social activities.

The national economic plan defines the objectives and social conditions of the industrialization process and the linkages with the other sectors of the economy with which the industrial sector has backward and forward relationships. Industry needs inputs from and provides its outputs to other sectors of the economy. The development of any one sector cannot be conceived of optimally in the absence of corresponding movements in others.

Soical and economic development is a dynamic process and calls for mutually reciprocating contributions of all sectors of the economy. A pre-determined goal of industrial growth will not be achieved if, for example, essential manpower inputs at the right levels are not forthcoming; and if forthcoming, only irregularly. The availability of the required levels of manpower can be ensured only if adequate education and secondary human resource development programmes including skill formation and up-grading support the supply of manpower are available, which reckon with the requirements of all sectors of the economy for manpower.

The comprehensive economic plan, as indicated earlier, encompasses the entire economy. Its scope is so broad that sometimes it is beyond the capacity of developing countries particularly in the initial stages of development. Practice, shows that these countries usually cannot prepare and implement a detailed and comprehensive long-term development plans. Therefore, in such cases the main effort should be devoted to develop sectoral plans. This can be regarded as the first step toward more comprehensive planning. Nevertheless, it is always urgent that the government and central planning body keep in mind the specific roles and interlinkages of these sectors within the overall long-term development process. It is also urgent that while developing industrial plan the basic needs of the people must always be taken into account.

Later on planning process can be expanded step-by-step on the basis of more accurate specification of the needs of the people and the conditions of true development to include specific sectoral planning within a comprehensive planning network.

In the practice industrial planning constitutes frequently the first step into development planning. However, it is of great significance that countries which embark upon industrial planning take into account the necessary interlinkages of industry with the rest of the economy in their industrial plans.

Is it Possible to Develop an Industrial Plan in the Absence of a National Plan?

Formulating and implementing the industrial plan should be carried out in conformity with the national plan. However, in cases where comprehensive planning activity do not yet exists, an industrial sector plan could be evolved, provided it takes the following into account:

1. Industry can only draw a part of the resources from national pool, which is drawn upon also by other sectors of the economy. The aggregate of the drawals should be programmed for all sectors to avoid serious bottlenecks.

2. Industrialization is a dynamic process which calls for mutually reciprocating contributions of various sectors of the economy. Therefore, the industrial plan should define forward and backward linkages of the industrial sector with the rest of the sectors of the national economy, particularly with agricultural sector. In fact, linkages with the agricultural sector in developing countries differ completely from that in developed countries, for industrialization in developing countries calls for structural transformation in agricultural sector which have feedback effects on industrial sector.

Stages of Development Planning

Development planning in the centrally planned economies differ substantially from that in mixed economies. The western economic literature usually refer to the earlier as "Directive Planning", while to the second as "Indicative Planning".

Directive Planning

Directive planning is applied in countries which do not practice market economy. It is a detailed and centralized planning system of resource allocation and production based on the quantitative reconciliation of needs and available supplies on the basis of balances and input - output analysis reaching down to every industrial enterprise and collective farm. Moreover, prices and profits are not supposed to play the main role in regulating the balance of supply and demand.

Under the directive planning, the state controls mainly through regulations directives and incentives the level of accumulation, the amount of consumption and investments as well as the structure of prices. The central planning body is responsible for the preparation of the plan on the basis of participation of the operating ministries, enterprises and relevant institutions in

plan elaboration and after discussing the plan objectives on different levels. The approved plan by the respective authority becomes a law and has to be followed by the administrations of component activities. Thus, plan preparation has to depend on the informational inputs and expertise at different times and segments of operating mechanisms. Although the central planning body is the final decision maker in the practice all the decisions are to be taken on the basis of iterative technique among various levels of planning hierarchy:

- What and how much is to be produced?
- How is to produce it and where?
- What inputs and what sources (investmental and operating) are to be used?
- What are the technologies and from what sources to be employed?
- How the output is to be distributed - including interactivity transfers?

Finally, it should be pointed out that there does not exist a "pure" system of directive planning, nor that of indicative planning. For example in the directive planning system we find indicative elements expressed in the form of various incentives, such as wages, taxes, prices, subsidies and moral incentives.

Indicative Planning

" Indicative planning is the use of centrally determined targets to co-ordinate private and public sector investment and output plans. Decision making remains decentralized but sectors of the economy are encouraged to meet agreed targets.... A major rationale of indicative planning is improvement in the flow of information within a market economy, and reduction in the uncertainty surrounding decision-making. By doing so business confidence is improved and stability and cohesion within the national economy promoted." 1/

A plan under indicative planning set out the desired targets which are mainly not mandatory. The preparation of the plan usually starts on a piecemeal basis with the formulation of public investment. In the indicative planning, prices are determined primarily by market forces, and the state regulates mainly through policies incentives and other promotional measures. It is obvious that in the course of implementation deviations from the goals and targets are much greater than under directive planning due to the impact of market forces under which indicative planning is practiced.

1/ The dictionary of Modern Economics. General Editor David W. Pearce. Macmillan Reference Books, 1983 P. 204

These deviations call for more frequent readjustments if serious imbalances are to be avoided or corrected.

Indicative planning has also directive aspects. As a rule, the plans in mixed economies are binding on the public sector where the government has direct control, but not on the private sector. Then, it is mainly relied upon persuation to influence the size and composition of private investments. For example, the French plans have been called mandatory in the public sector and indicative in the private sector. The director general of the French Commissariat Général du plan has been able to express this as follows:

> "French planning can be said to be less than mandatory and more than indicative. It can reasonably be defined as active planning." 1/

In comparing planning in the developing countries and developed countries under the indicative planning, several similarities and at the same time substantial difference will be found. In quite general term, the main similarities are in the facts that both practice market economy on the one hand and the spread of economic planning is related to the role of government in economic activities on the ohter. The main differences,

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1/ Massé, Pier, Planning in France. Planning Papers read at the Business Economist Conference at New College, Oxford, London Business Economists Group 1962. April 5 -8, 1962. P. 17

however, are related to the planning function. While in the developed countries of market economy planning is required to avoid economic crisis; in developing countries, it is the precondition of industrialization. In the first case, the main function of planning is rather maintaining overall balance between supply and demand; whereas in the second case, its main function is to restructure the productive forces to expand the industrial sector and introduce modern technologies into agriculture, construction and other activities of the national economy. Thus, planning objectives in developed market economies differ greatly from that in developing countries in almost all respects. For the plans in the former are mainly forecast of global economic trends and recommendations on the adoptation of some government policies to achieve economic stability in an economy with a dynamic private sector. Such plans, of course, cannot be adequate instrument for industrialization in developing countries. This is above all due to the fact that under the conditions of free market forces, industrialization cannot occur in developing countries. 1/ This evidence does not need to be proved. For the present situation of developing countries itself provides the proof that market forces are unable to create

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1/ There is a significant distinction between industrial growth and industrialization. This problem will be dealt with in details as the discussion proceeds.

a process of development. This result is not a pure coincedence and its causes cannot reasonably be expected to generate counter effects. In order to overcome economic and soical backwardness and to bring about self-reliant and self-sustaining economic development, planning in developing countries must be based partly on principles which contradict the laws and tendencies of development of market economy.[1/] For example, it is logical that if a developing country decides upon introducing national key projects of basic industries, the planner must decide on the rate of investment, choose the appropriate technology and fix the prices of the products. These prices must, of course, differ from free market prices to permit these infant industries to establish themselves. Other decisions would also be required to protect these industries from outside competition, otherwise under the conditions of free market economy, these industries could easily be suffocated by the competition of powerful transnationals whose position in the world market is well established.

1/ "The unrestricted play of market forces is not the most suitable means of promoting industrialization on a world scale nor of achieving effective international co-operation in the field of industry ...."
(Lima Declaration and Plan of Action Point 42)

Choice of Planning System for Developing Countries

If any country in the world wishes its planning activity to be concrete, efficient and operative, then the nature of its planning activity must be coherent with the nature of its economic structure. According to this fundamental principle, we find that no authority can plan or organize any economic activity which is beyond its control. In fact whatever the willingness of the central planning body might be, its authoritative planning can only be effective within the part of the economy which is under its authority. With respect to the other activities, however, the central planning body can only give recommendations, suggest objectives and strategies, as well as applying usual procedures of economic policies, such as legislations, regulations, subsidies, taxes, custom duties and monitary policy.

Planning experiences in a large number of countries in which the state owns some public enterprises under conditions of market economy show that even activities owned by the government cannot be put under effective governmental control. In these countries the managers are able to maintain a kind of concrete autonomy toward government. For example, if the manager is politically powerful or in cases where the plant is in remote areas or where the engineering capacities are at the disposal of

of the enterprise.

Moreover, even for countries in which the state do not practice market economy it is not possible to control all productive activities. For example, it is almost impossible to control peasantry and handicrafts.

Therefore, it is of extreme significance that the planning authority in developing countries clearly identify activities which are usually under the state control, and the extent to which the central body could exercise its control in different areas. The identification procedure must reflect the current situation objectively. It is instructive that planning authority would also envisage possible and desirable changes in the current situation in the future. For example, the extension of state's ownership within additional activities to permit more effective planning. However, it is worthwhile mentioning here that the decision by the state to expand its ownership within new activities does not necessarily mean that the state can effectively exercise control over these activities if it does not have the means necessary to ensure such control. The identification of the fields of government's control will permit the following significant consequences in the planning process:

1. The part of the plan concerned with those activities of the economy that are owned and possible to be completely controlled by the government will be "directive". This is necessary

because it would be contradictory to prepare a plan without implementing it. "Directive" does not mean authoritative from top to the bottom. Here it is necessary that adequate procedures should be undertaken to permit managers and workers to participate in the process of plan elaboration.

This part of the plan is of extreme importance due to the fact that it is the only part which can virtually be implemented. This is why the existence of a public controlled sector is a prerequisite for planning efficiency.

2. The part of the plan concerned with those activities of the economy which are owned by the government but difficult to control will be "semi-directive" for it cannot be"directive" in the same sense as those indicated earlier. Here the government can reinforce its control step by step. It should, therefore, use the means at its disposal in order to permit better plan implementation. For example, the government can attribute or not attribute funds. It can persuade the workers or to offer them incentives to exercise pressure on managers to fulfil the plan targets.

3. The part of the plan concerned with the activities of private sector will be "indicative". Here, the central planning body can set oriented objectives which are expected to be realized during the plan period. Therefore, the government must use all means at its disposal

in order to direct the activities of private sector toward achieving these targets. Some of these means are listed below:

- Investment in the infrastructure determines by far the location of different economic activities;
- Price policy enables the government to encourage or discourage different activites to the extent required;
- Credit and custom polocies are also desicive to encourage desired activities to the levels wanted.

These means determine the efficiency of planning, and the government in developing countries must create the conditions necessary to effectively use these means.

Taking into account the complexity of planning process, it is evident that no country in the world is able to control all the productive activities. Nor there is any country which is fully devoid of any elements of state controlled activity and state owned activity. In such a way, every plan in any country in the world can only be a mixed of "directive", "semi-directive", and "indicative elements". Therefore, there is no choice between one for another. The proportion of the "directive" and "indicative" elements is dependent upon the existence of different sectors within the economy.

Developing countries where a government cannot exercise state control even within the public sector, the major objective of planning may initially be confined to economic policy and may

create conditions for an enlarged effective control.

What are the differences between "directive" and "indicative" elements of the plan:

a) These elements do not differ with respect to qualitative and quantitative aspects. For all the elements of a coherent plan have to obtain the same degree of realistic planifications, such as targets, means for realization and deadlines. Otherwise no plan consistency can be established.

b) The differences between these elements exist on two levels:

1. The preparation of plan requires to organize negotiations with private activities and those state owned activities which are difficult to control. Specific procedures of consultation with peasants, handicraftsmen and small enterprises would also be required.
2. Proper plan implementation requires incentives and measures for private sector enterprises and to some extent for those state owned enterprises which are difficult to control.

Industrialization and the Role of Industrial Plannings in Developing Countries

Industry and Economic Growth

In the history of mankind structural economic progress or development is relatively modern. Prior to the industrial revolution, the rates of growth of the economies changed slowly over long periods of time with very little development and not void of setbacks due to incidents of wars and diseases or bad seasons. In much quoted essay, called the Economics of our Children, Lord Keynes, once said :

> "From the earliest times of which we have recorded ... down to the beginning of the eighteenth century there was no very great change in the standard of life of the average man ... ups and downs certainly. Visitations of plague, famine and war. Golden intervals. But no progressive violent change... This slow rate of progress was due to two reasons to the remarkable absence of important technical improvements and to the failure of capital to accumulate."

The coming of the industrial revolution, and with its mechanical power and factory production, continuous technical change and accumulation of capital changed all that. As a result, the economies of the industrialized countries since the industrial revolution measured per capita of the population, was several hundred of times higher than what had previously been attained.

Industrial Growth in Developing Countries

Industrialization process in the developed world exerted backward effects on developing countries, with a result that industrialization in developing countries did not occur and their economies remained by and large onesided, i.e., raw materials and food export economies. However, during the past thrity years industrial activities have been playing more role in overall growth in these countries. But in many respects the process of industrial production in a number of developing countries is being determined by external factors associated with their economic and scientific-technical dependence rather than internal ones. The economies of these countries are currently characterized by low level of integration, weak internal inter-sectoral relations, as well as the existence of economic enclaves associated with foreign countries rather than with their own economies. In these cases industrial growth is left mainly to the uncontrolled market forces where the economic proportions develop under the influence of external factors rather than as a result of internal production linkages at the level of national economic complexes. Moreover, these proportions are constantly vunerable to changes in accordance with the shifting of structures of supply and demand in the world market.

It should be pointed out here that industrial development is not an isolated aspect of economic development. It is, in fact, subservient to the latter and its success lies in the extent to which it serves the basic socio-economic objectives. Thus, industrial growth by itself (number of plants and number of wage earners) should neither be an objective nor an indication of a successful industrialization process. For industrial growth can be achieved by diffferent means which might cause both economic and scientific-technological dependence upon external factors and negative impacts on the other sectors of the economy, or cause undesirable consequences for the whole economy. For example, the ruin of the traditional industrial sector, the weakening of the agricultural sector, depletion of scarce resources, and expatriation of benefit and profits with the resultant heavy debts burden.

Industrialization of Developing Countries

In order to clearly draw distinction between industrialization and industrial growth in developing countries, the following two basic and connected questions have to be answered:

1. What is to be produced?
2. For whom is it to be produced?

The answers to these questions are quite simple and clear if we keep in mind that the ultimate aim of industrialization must be the development of people, i.e., the increasing degree to which their needs are satisfied on the one hand and their access to productive jobs and participation in the collective decisions. 1/ This approach differs greatly from that in which the decision on production is left to the market forces with the result that the whole process turned out to be a mere deployment of industrial capacities far beyond the benefit required from them.

Therefore, it is indispensable to precise what type of development we expect from the process of industrialization to be able to define the terms and conditions of the latter.

There is common agreement that industrialization is the only way of extricating developing countries from poverty and backwardness. This is due to the fact that industry creates by far, conditions for the efficiency of the whole economy, the volume of national income, the tempo of economic growth through the capacity for autonomous accumulation and further structural development. With the help of industrialization

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1/ "In formulation of industrialization plans and strategies, ..., social justice should be a guiding factor in achieving the objectives of raising the living standards and eliminating extreme social disadvantages and employment, particularly among young people. To this end, proper industrial development should permit such growth as is required for economic development."

"The equitable distribution of the benefits of industrialization among all sectors of the population." (Lima Declaration and Plan of Action Point 85 a and b)

extensive diversification of the pattern of the economy could be introduced on the basis of equipping various sectors of the economy with machineries and utilizing modern technologies and techniques of production. For example, modernization and restructuring the agricultural sector by supplying agricultural and irrigation equipment, means of transport, fertilizers and pesticides or modernization and expansion of the infrastructures by supplying transport and communication equipment and construction materials. Thus, industrialization does not only mean the development of industry, but also include through the introduction of industrial means of production into other sectors of the national economy the increasing of labour productivity in all other activities.

> Finally, a country becomes industrialized as from the moment when on the basis of the autonomous industrial capacity the basic needs of the population has been satisfied on the one hand and a significant part of its economic and social structure becomes transferred by the complexity of machineries implemented on the other.

The Role of Industrial Planning in Industrialization of Developing Countries

In quite general term, the introduction of planning principles provides an effective basis for identifying clearly both the objectives and targets of development and concrete ways and methods for achieving them, as well as mobilizing the resources required for both current and long-term development. The introduction of industrial planning, in particular provides the prerequisite for industrialization. The industrialization process can only be realized on the basis of clearly defined "long-term" plans of industrialization based on the nation's own efforts and completed by the adoption of concrete measures and by the implementation of efficient institutional mechanism. It is this that constitutes the very object of "industrial planning" in developing countries, an expression we would apply as virtually synonymous with the "planning of the process of industrialization" or of "planned industrialization".

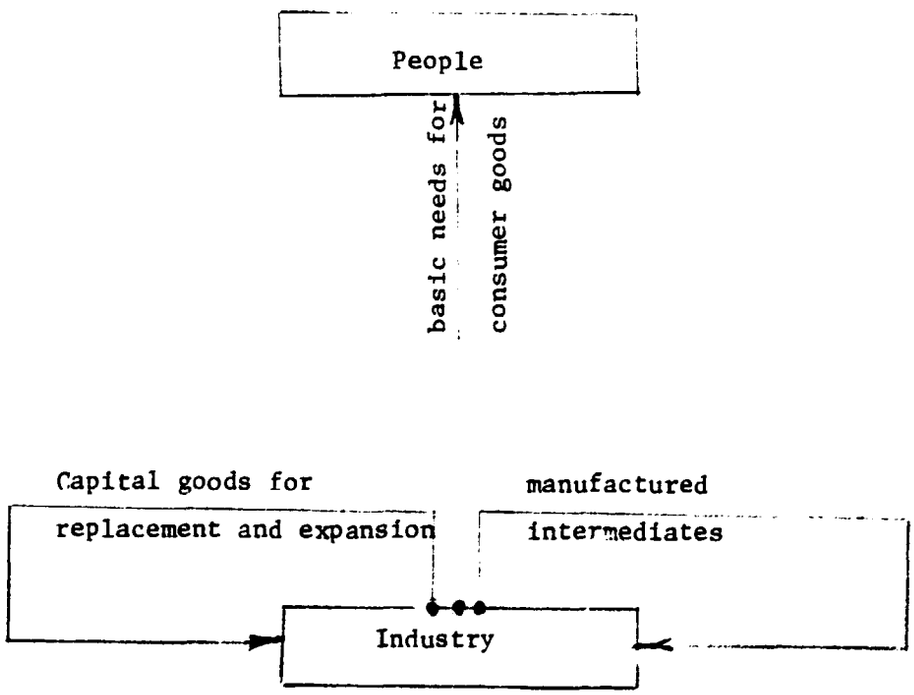
Industrial planning in developing countries must serve the following industrialization functions:

1. Expanding the industrial sector to the extent that it meets the following in the long run (see also figure 1.1):
   a. Basic needs of the large majority of people for manufactured goods.

b. To a large extent the requirements of the national industry for manufactured intermediates.

c. To a large extent the requirements for capital goods for both replacement of worn out equipment and expanding industrial production capacity. The functions (b) and (c) mean that the industrialization must be planned in a way that it ensures the self-reliant growth which is of extreme importance for industrialization. This issue will be discussed in details in Chapter III.

Figure 1.1



2. Modernizing and restructuring the agricultural sector by supplying it with agricultural and irrigation equipment, means of transport, construction materials, fertilizers and pesticides.

In cases where neither comprehensive planning nor agricultural planning yet exist, industrial planning must envisage the appropriate form of agrarian reform for the country. This is of extreme importance. For in order to bring about the intensive modernization within the agricultural sector an appropriate agrarian reform must be introduced to facilitate the whole restructuring process in agricultural production, in particular the application of modern agricultural technology. In fact only on the basis of relevant social relations it would be possible to implement the agricultural equipment, fertilizers and other industrial inputs required for increasing agricultural productivity.

Industrial planning must strike the necessary balance between industry and agriculture on the basis of quantification of agricultural requirements for industrial inputs necessary to introduce structural transformation to satisfy basic needs on the one hand and the feed-back effects of structural transformation on industry on the other. The interrelation between industry and agriculture due to the restructuring the latter usually takes the following forms:

a. High agricultural productivity increases agricultural surplus production which would in turn lead to the following :

(i) Improvement in the standard of living so that the basic needs of the major social groups can be better satisfied. The improvement in the living standard of the peasants creates progressivley further demand on manufactured consumer goods, providing an increasing number of industrial jobs and cumulative effects.

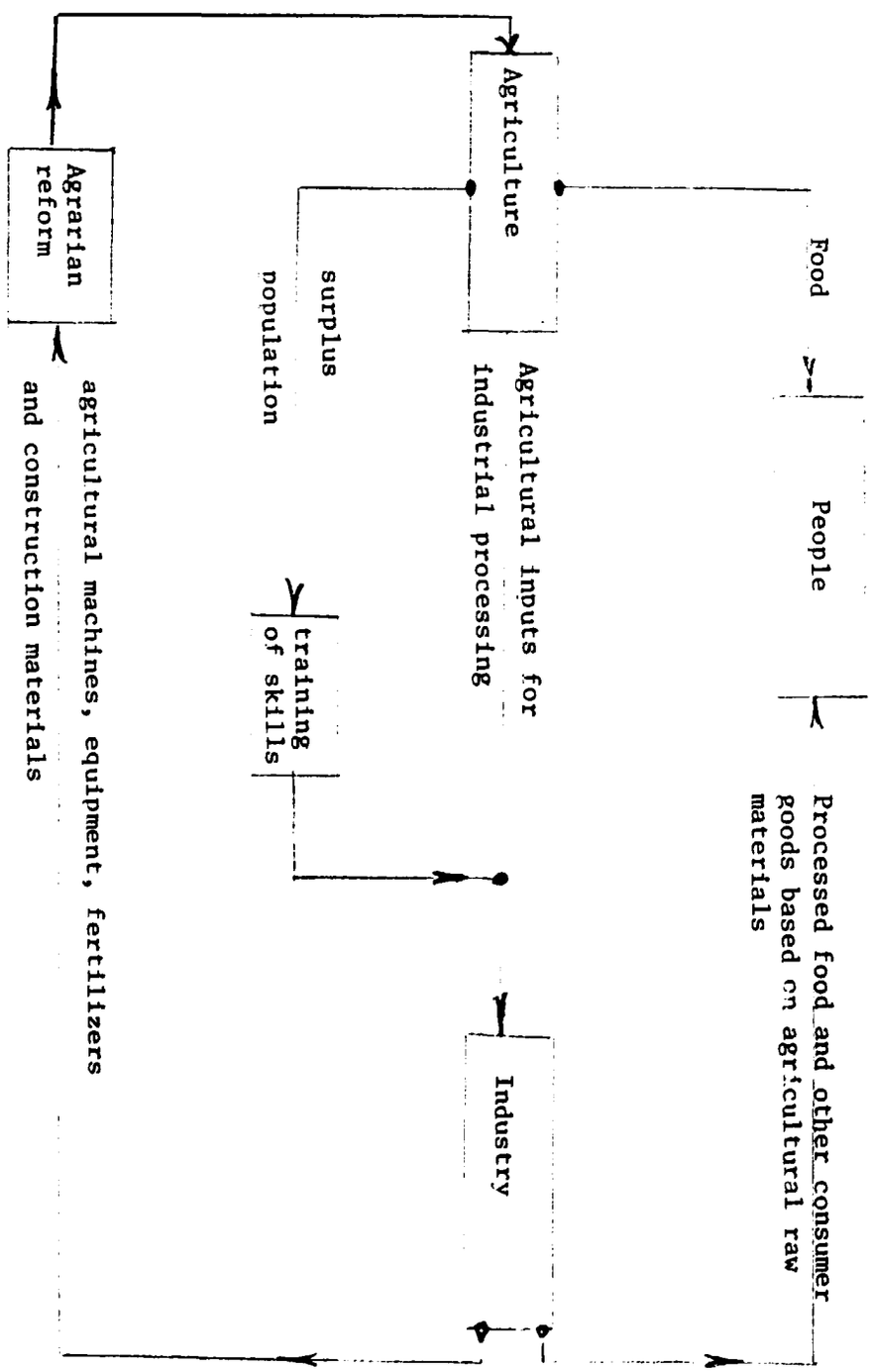
(ii) Increase of agricultural input necessary for industrial processing, such as non-processed food stuffs, wool, cotton, timber, straw, bagasse, etc. Thus, contributing to the expansion of industrial output on the basis of local raw material resources.

(iii) More possibilities for export. However, exports of processed agricultural products might create serious food shortages at home. In fact most developing countries with chronic malnutrition and starvation are food exporters. Therefore, export of food is not the most effective way for developing countries to improve their balance of payments. Food must only allowed to be exported when it is proved to be a real surplus.

b. Intorudction of new technology into agricultural sector increases by far the labour productivity creating thereby further surplus in the rural populalation. However, industrial expnasion creates new jobs which provide for the transfer of surplus rural population to the industrial activity. Therefore, industrial planning must provide programmes for both transfer of surplus rural population to industry and therefore required training, formation of skills and education.

It is worthwhile mentioning here that the organization of relationship between industry and agriculture constitutes the most critical area in industrial planning (see figure 1.2).

Figure 1.2



3. Modernization of other sectors of the economy, such as construction, mining and services.

The modernization of construction is of extreme significance for industrialization and improvement of the standard of living. Construction is in most developing countries based on traditional methods with very low performance and productivity and usually constitutes the main bottleneck in plan implementation.

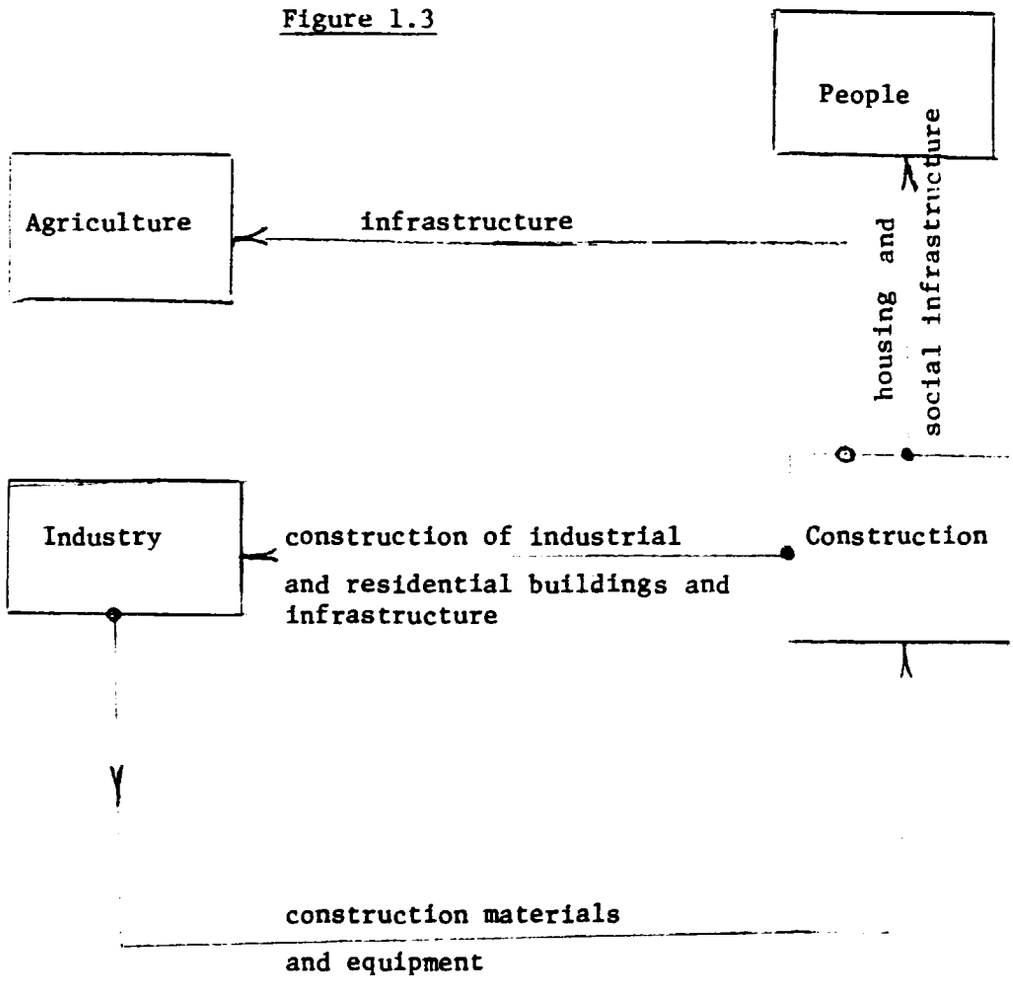
Industrialization requires huge construction works, such as industrial plants and districts, roads, rail roads, bridges, ports and housing. These projects cannot be constructed on the basis of traditional methods which are characterized by very poor performance. Otherwise the gestation periods of development projects will be rather long and the cost of development will be very high.

Moreover, weak rural communication and badly maintained rural access roads hinder the further transportation of agricultural products. This also requires the strengthening of the construction sector. More urgent is the housing situation in developing countries. High percentage of urban population are living in an undecent residential conditions. The urban housing situation in a number of these countries is deteriorating due to the overall population growth and rising ratio of urban to total population on the one hand and shortcoming of construction on the other.

Therefore, industrial sector must provide the construction

sector with sufficient construction materials and equipment necessary for upgrading the efficiency of construction sector. For example, pre-stressed concrete, panels and cranes in addition to the ohter construction materials and equipment in order to enable it to cope with the requirements of industrialization and population for housing and social infrastructure. Industrial planning must quantify these interlinkages and strike necessary balance between industry and construction (see figure 1.3).

Figure 1.3



The Role of Government in Planning the Industrialization Process in Developing Countries and Relevant Problems

There has been a growing recognition among developing countries that the achievement of economic independence, the overcoming of backwardness and the implementation of the socio-economic transformation cannot be realized without the intervention of the state. This is due to many factors, some of which are listed below:

1. Low domestic capital formation in most developing countries.
2. General weakness of the private industrial sector due to both the general weakness of industrial activity and strong attraction of commercial and speculative activities in these countries.
3. Concentration of economic and financial resources within the public sector, mainly from the taxes levied on various activities by the government, particularly on foreign trade, as well as direct revenues from the exports of minerals other commodities.
4. Therefore, in most developing countries only the public sector could mobilize the financial resources to provide the social and physical infrastructure, and to a large extent the key industrial projects, where the pay-off periods are long and a substantial sum of the required capital should be paid in foreign currencies, particularly in the initial stage of industrialization.

5. Foreign capital operating in the country, especially within the vital economic sector, as well as foreign aids and loans also necessitate government interference in order to regulate foreign capital.

Thus, the government in developing countries is not merely as organizor of the development process, but also as direct participant. This, in turn, made it necessary for the government to play a central role in planning.

Internal and External Factors that Handicap Development Planning in Developing Countries

Notwithstanding these facts planning experience of a great number of developing countries have proved that the government has not been able to effectively use public financial and economic resources to achieve sustained growth. There are a number of internal and external constraints that militate against development planning in developing countries. Some of these factors are listed below:

1. Factors peculiar to the state apparatus and its approach to development planning

a. Development planning first of all depends on social conditions: all social groups which can exercise political or economic power have to agree upon the planning logics of its objectives and methods. Political unstability in many developing countries shows that this precondition is far from being achieved. Above all, development planning to be effective requires a

serious commitment to the plan upon the part of the policy-makers in the country. This is in fact the main prerequisite to successful planning in developing countries.

b. The present administrative apparatus in developing countries is not yet up to the task of carrying out industrial planning. Industrial planning requires from most of the developing countries an organized efforts to upgrade their administrative apparatus. Such an effort is usually a part of the development process. Weak level of development and weak level of administrative efficiency are linked. In fact only few developing countries can cope with the range and complexity of administrative problems which development planning brings. This is mainly due to the fact that the administrative system of governments is established previously to meet corditions differ completely from those prevailing at present, they have not yet been adapted and adjusted sufficiently to greatly changed circumstances. Industrial planning cannot tolerate a system of rigid hierarchial routing of correspondence and other communications signing and countersigning of documents by several persons and forming unnecessary committees at the expense of much delay and confusion. At present the management in developing countries is challenged to mobilize resources and to reach targets on a fixed schedule.

Thus, the primary administrative task in most developing countries is to further reorient government machinery to improve meeting the demand of industrialization.

c. The way most developing countries approach development planning cannot lead to substantial and sustained industrial growth. In fact planning is still in a premature state in most of these countries. The government still regards the development plan exclusively as a programme to allocate investments with the result that the plans are mainly financial schemes. These plans are void of both internal consistency and schemes to implement them in accordance with the physical capacity of the country.

These problems, however, will be dealt with in details in Chapter II.

2. Problems connected with the integration of private sector in industrial planning

> "In the developing countries national industrialization policies should lay emphasis on ensuring an adequate role for the state in the direction of industrial development and the public sector in the expansion of industries.

> Elaborate measures by which private and foreign investment could be effectively used in order to achieve the objectives of national economy development plans." (Lima Declaration and Plan of Action Point 58 n).

Industrial planning activity in developing countries are confined mainly to the public sector. Only few developing countries have made some attempts to include or influence to some extent the development of the private industrial sector in their plans.

In many cases the industrial expansion caused the ruin of traditional and small-scale industries and was not able to replace them by creation of modern manufacturing industries. This is mainly due to the absence of clearly defined plan goals and objectives concerning the industrial sub-sectors where the state and the private sector could develop and co-ordinate their activities. This can, of course, be a consequence of the limitation of industrial planning to the public sector, as well as the behaviour of private profit oriented industry.

Effectively, in many cases the private sector militates against creating or successful operating of development projects within the public sector becuase of contradictory interest or competition. Private businessmen usually influence public administrators to select choices and dècisions in their favour which results in increasing the costs of devevelopment and reduction the efficiency of the industrialization within the public sctor. In fact corrupt practices within the public sector in developing countries undermine to a high degree every effort to plan the industrialization process.

In other cases the national private sector forge alliance with transnational corporations to operate in the country. In this form the operation of private sector would be difficult to plan or control in accordance with the directions and interest of the national industrialization process.

3. Problems connected with operation of transnational corporation

> "The unrestricted play of market forces is not the most suitable means of promoting industrialization on a world scale nor of achieving effective international co-operation

> in the field of industry and that the activities of transnational corporations should be subject to regulation and supervision in order to ensure that these activities are competible with the development plans and policies of the host countries, taking into account relevant international codes of condusts and other instruments."
> (Lima Declaration and Plan of Action. Point 42).

The uncontrolled transnational corporations in developing countries constitute a major handicap to planned industrialization. The operation of transnational corporations is firmly controlled by forces outside the country and usually have considerable negative impacts on the industrialization process in the developing countries. Experience shows that even large and relatively powerful developing countries are not in a position to force these firms to respect the objectives of their plans. This is of course, mainly because the strategy of transnationals is formulated according their large scale operation within the framework of the process of internationalization of industrial branches. Hence, the choice of their operation

sites, production and technology used are defined according to this strategy. Transnational corporations have many alternative possibilities or operation, therefore, they have nor reason to bind their strategy (or make it less perfect from their point of view) in order to response to the wishes of the particular country. Thus, transnational corporation usually do not show much interest in countries with planned economies. Because frequently the planned industrialization objectives differ greatly from those of the transnationals. History shows that activity of transnationals is a difficult task and to counterpart the actions from the part of developing countries to gain control on their activities creates mostly conflictual situations which might lead to reprisals connected with economic losses for developing countries.

4. Problems connected with the relative prices system on the world scale

a. In the current world situation the relative prices system constitutes a de facto imposed by developed countries on developing countries through the vertical foreign trade. This system corresponds to the present state of development of productive forces in develop countries. The relative price system can further impede development of productive forces in developing countries. It has been demonstrated by many economists on the hand of a number of examples, such as West Africa, Panjab, Peru, and the Philippines, that any technical

progress in production of food crops in developed countries makes it impossible for traditional agriculture to survive in developing countries. As a result in many cases agricultural production in these countries has been either deteriorated or forced to shift to capital-intensive production methods. This situation urgently calls for south - south co-operation. It also provides a significant challenge for planners in developing countries to contemplate possibilities to protect the national industrialization process.

5. Problems connected with the present economic crisis

In response to the current economic crisis and mounting inflationary pressures, monetary and physical policies in the developed countries of market economy turned to be increasingly restrictive. The combination of monetary restraint and severe inflation has led to a large increase in interest rates in both real and nominal terms, particularly from private financial institutions.

Many non-oil exporting developing countries, particularly the newly industrialized countries whose industrial activites are to a large extent being interlinked with the economies of developed countries of market economy; have beeen facing mounting difficulties in connection with their debt payment conditions. This is due to the following factors:

1. The international purchasing power of export earnings of most of these countries has been reduced due to weakening demand in developed countries and deteriorating terms of trade.
2. Imports of developing from developed countries are determined by the strong dependency of industry and other activities in the former upon the developed countries for capital goods, technology, intermediates, as well as some consumer goods and ohter kinds of imports. Thus, imports are not determined solely by the exports purchasing power and usually exceeds restricted exports with a resultant debt burden.
3. The debt servicing (interest principal payment on accumulated external debts) are sometimes higher than the new borrowings due to the high interest rates and the limits of borrowing possibilities from official sources at relatively lower interest rates.

As a result the combined current account deficit of the newly industrialized countries has reached astronomic figures and it is expected to increase further in future.

It is, of course, impossible to plan the industrialization process under these circumstances where the situation in the world market

decides by far for these countries "what is to be produced" and "for whom is it to be produced". Moreover, a long-term solution of this problem is beyond the capability of these countries for it requires changes in the economic structures of developed countries.

b. In response to the current economic crisis, increasing unemployment and the weakening demand and exports, developed countries of market economy have introduced measures of controls to protect themselves from low priced exports from developing countries.

Protectionism hurts developing countries by reducing both their opportunity to earn foreign exchange necessary for industrialization and improving balance of payments, as well as depriving them from the advantages of international division of labour based on equality.

c. There has been a tendency among developed countries, particularly during the current economic rises to export new sophisticated technologies to developing countries. These technologies are developed under conditions differe completely from thos prevailing in developing countries, such as high competition, high wages and

abundant capital. In most cases the introduction of these technologies are usually represented in form of "closed packages" and supplied on the "turn key basis". In this way the foreign exchange of a developing country would be absorbed in fewer projects. More important are the facts that capital - output ratio might be very high due to low utilization levels on the one hand and the creation of strong dependency upon technology suppliers for replacement of capital equipment, spares, various intermediates and technological inputs on the other.

Conclusion

Concentration of economic and financial resources within the public sector provided the government in developing countries with the necessary prerequisites to promote and plan the industrialization process. However, it has been recognized that the benefit from industrial planning have not been up to the expectation of these countries. This is due to internal and external factors. Internal factors are connected primarily with the state apparatus, little discipline of its policy-makers, its unappropriate approach to industrial planning and limiting its planning activity to the public sector.

Reliance upon planning to promote industrialization urgently needs an appropriate environment within the government apparatus. This calls for efforts to start, first of all, with the commitments of the policy-makers to plans, improvement of the administrative machinery and improvement of the planning process. The administrative system should be reformed, restructured and reorganized to facilitate conditions necessary for continuous planned industrialization for both sectors of economy (i.e., public and private sectors).

The major external factors encountering industrial planning in developing countries are: First, the operation of transnational corporations. These corporations are firmly controlled by forces outside the country and usually follow objectives differ greatly from those of national industrialization. However, if their operation seems to be beneficial to the country, then it is the duty of the planner to closely examine these benefits and weigh them against all possible economic disadvantages and risks connected with their operation in the country, as well as considering means and measures to exercise some control over their operation. Second, the relative price system. Under the current world situation relative price system is playing

a decisive role in restructuring the economies of developing countries in a way different from that of their industrialization strategies. This calls for protection measures and more co-operation among developing countries. Third, the present economic crises resulted in more debt burden of many developing countries. These countries are strongly dependent upon developed countries for industrial inputs and other imports on the one hand and traditional and industrial exports on the other. The fact that their demand on imports from developed countries is higher than their exports opportunities leads to borrowing from the latter. However, borrowing under the current situation where the rates of interest are rather high causes further debt burdens. Moreover, protectionism exercised by developed countries and exports of highly sophisticated technologies aggravate the situation in these countries due to reducing exports opportunities and creating more technological dependency which leads in the final resort to more imports and more debt burdens.

This is the complexity of industrialization problems that developing countries face under the current situation. These problems are immense and constitute rigid constraint to

industrialization. Therefore, industrialization cannot be achieved spontaneously under the current situation which is dominated by the unrestricted play of market forces. Industrialization can only be achieved on the basis of scientific principles and within appropriate socio-economic environment. These principles and other necessary means and methods for planning the industrialization process will be the object of these Guidelines.

CHAPTER II

INDUSTRIAL PLAN STRATEGIES FOR DEVELOPING COUNTRIES

Industrial Plan Strategies

For the majority of developing countries the need for the most rational utilization of available resources for industrial development is becoming increasingly urgent. Most of them possess abundant resources of some kinds and shortages in others. For instance, surplus labour and insufficient physical capital, or huge excess in few minerals. Industrialization must be planned in a way that it ensures substantial absorption of surplus resources and overcome the supply shortages of scarce resources in the long run. For example, by expanding basic industries or intensification of geological surveys and shifting to alternative intermediates and alternative commodities. Only on the basic of well planned industrialization it would be possible to restructure the economy in such effective way to substantially increase the output in order to improve standard of living and accumulation. In this connection industrial planning must decide on a number of relevant issues, such as the ratio of output of means of production to that of consumer goods, i.e., the structure of the productive sector of production, the order of priority to be assigned to different projects and industries, their interlinkages with the rest of industrial sub-sectors and other sectors of the economy, their relative growth at particular periods, and choice of methods of production, as well as the choice of appropriate configurations of commodities and intermediates necessary for their processing. The decision on these issues constitutes in fact the plan strategy.

The industrial development strategies constitute the overall structure within which industrialization must take place and toward which it should be oriented if it is to bring about purposeful long-term industrial development.

In most cases failure to formulate and implement industrial plans are indirectly attributed to the lack of industrial development strategies where industrial plans can follow a clear line which might lead to sustained growth. Few industrial plans in developing countries indicate what is to produce first and how, where to channel the output and why, and how to satisfy the basic needs?

The policy-makers and industrial planners must formulate industrial development strategies in complete compliance with factors peculiar to the country, such as size of population, diversification of immediate usable natural resources, capital supply status, manpower supply status and the technological status.

It is also of particular significance that planners and policy-makers derive hierarchy for industrialization strategies. It is self-evident that some strategies might overlap and some

might form the prerequisites for others. In the following we will discuss the main industrial development strategies for developing countries. We will start with the self-reliant self-sustaining strategy which could be and should be common and central industrial strategy for all developing countries.

1. Self-Reliant and Self-Sustaining Growth Strategy

> In order to ensure a sustained industrial growth in developing countries, the basic strategic sectors of the economy should be given priority. These sectors are of great significance for industrialization because they form virtually the material basis of internal accumulation.

A review of trends, problems and deficiencies arising out of the past experiences of industrialization process in developing countries shows that industrialization in these countries has lagged for quite a long time behind developed countries and their economies remained until recently raw materials and food- export economies. Moreover, industrial progress which

have been taking place in these countries since the end of the second world war failed to reduce the dependency upon developed countries for physical capital and technological innovations which also account for the weak pace of industrialization in developing countries, particularly in the lower income countries. Developing countries failed to industrialize substantially in the absence of the sectors of the economy which produces the physical capital. Industrialization must provide for the expansion of physical investment capacity of the country. For new investment here are not just financial resources. Financial resources do not remove the bottlenecks of physical capital resources in developing countries. Therefore, developing countries must in the initial stages of industrialization concentrate upon basic industries to meet development demand.

In this connection the Lima Declaration recognized, among other basic problems that industrial progress had not displayed significant advances in the developing countries as a whole and that any real progress of industrialization worthy of the name must confirm to the broad objectives of self-sustaining integrated socio - economic development. Moreover, the Declaration called upon the developing countries to devote particular attention to the development of basic industries, such as steel, chemicals, petrochemicals and engineering thereby consolidating their economic independence. Thus, to ensure a sustained industrial growth in developing countries, the key strategic sectors of the economy should be given priority. Industrialization leads to increases

in demand for steel, construction materials, fuels, power. Obviously, new factories, steel mills, power plants and infrastructure cannot be built faster than cement and steel and bricks become available for their construction and fuel and power are available to drive the new machinery when it is installed. Thus, a nation cannot maintain a progressive rate of growth unless it has developed the strategic products necessary for its industrialization.

It is also true that a nation which is monoproductive would depend to a large extent upon the external markets for ensuring its own development on the one and would only be able to increase the level of satisfaction of its population's needs to the extent that the rest of the world would allow it on the other hand.

It will be worthwhile mentioning here that the self-reliant and self-sustaining strategy does not imply an autarik system aimed at a complete self - sufficiency. There is neither the need nor-in most cases - the possibility to create immediately a heavy industrial basis enabling a complete self-reliant development. Developing countries do not have to start from scratch and transverse the whole path which was covered by

developed countries in the past. This can give them a definite gain in time and resources. Thus, at the first stage of industrialization, developing countries would be able to acquire substantial part of the means of production abroad to build up and extend their own basis for industrialization in the long run.

In this way the self-reliant and self-sustaining strategy implies a built in mechanism for organic growth tending to reduce by large the dependence upon the outside world for the basic means of production by expanding the internal physical capital potential.

It should be pointed out here that developing countries which have large population and varied primary resources are more able to follow this strategy than small developing countries with limited resources. However, even small developing countries are able to develop to a certain extent their basic industries. For example, instead of creating integrated large-scale iron and steel industry, it might be reasonable to construct a small rolling mill for main products demanded by construction and mechanical engineering sectors. Another example would be limiting the capacities of the engineering sector to the production

of machines and tractors that are in high demand. It should be pointed out here that there are plenty of opportunities in small countries for developing their refineries, electrical generating plants and construction materials industries. And there do seem to be plenty of opportunities within the engineering and metallurgical industries for concentrated and specialized production to meet essential part of development requirements in these countries.

Moreover, co-operation among developing countries is of extreme importance particularly for small developing countries. In this respect the principle of collective self-reliance among developing countries is of great importance to facilitate to a large extent the indegenous industrialization and reduce critical external dependence for capital equipment, technologies, spare parts, semi-finished products and technical and skilled manpower.

In the industrial area, collective self-reliance is based on the establishment of industrial structures by benefiting from economies of scale at the regional level, increasing the degree of processing of their raw materials, and diversifying the goods and services that can be traded among countries at similar income levels. Production complementarity has to be planned but may go through a variety of channels from joint ventures to co-ordinate sectoral planning, and is likely to generate much greater increase in trade than looser forms of co-operation.

Finally, it is worthwhile mentioning that the status of basic industries is indirectly connected with the capability of plan implementation in developing countries. If we revert to what was said earlier in Chapter I about the main bottleneck in plan implementation, it will be remembered that discrepancies between financial funds allocated for development project and non-availability of physical capital required to construct and equip these projects account for the prolonged plan execution. The availability of financial resources will not lead to expanding industrial capacities if cememt, bricks, steel bars and sections and machineries as well as construction capacities are not available in sufficient quantities. Many of these items will be very costly if imported. In order to transfer financial funds into physical capital, the country must embark upon creation and expansion of the above mentioned basic sectors of the economy which form the material basis for internal accumulation.

2. Import Substitution Strategy

Industrial growth, particularly in the initial stages, is in most developing countries closely lined with import substitution, i.e., with the introduction of the domestic production of articles previously imported. In this sense, the import substitution strategy overlaps with the self-reliant and self-sustaining strategy. For the latter is in fact to some

extent also import substitution of some products of basic industries that previously imported.

The import substitution strategy is well known in the industrial planning practice. A number of factors have contributed to the emphasis of several countries on the strategy of import substitution for their programme of industrial growth. First, the development in the initial stages in searching for a foot-hold, as a base. Import substitution implies that the demand already exists.

Second, most new enterprises in developing countries do not have the export capability. When they try to develop such capability they often meet direct confrontation with commercially very powerful transnationals and other companies strong in international commerce. Such competition is very severe even in the Third World.

Third, import substitution provides the new industrial undertakings in the developing countries with substantial advantages due to the absence of overseas freight, insurance and other related costs which are entailed in the counterpart imports.

Fourth, import substitution gives, by large, the advantage of reducing continuous outflow of foreign exchange. When import substitution activity has not been selective with the necessary precaution, the reduction in the outflow of foreign exchange has been minimal, or where the local production has stimulated demand it has, in fact, been negative. Nonetheless, import substitution has in many developing countries averted crisis of balance of payments positions.

Import substitution has, however, some distinct handicaps and deficiencies in industrial planning practice in developing countries, some of them are listed below: First, with import substitution, the technological dependence of developing countries upon few transnationals has increased in many cases. Foreign products have adopted almost 'blindly' without much modifications. Some of the products are copied not only in basic specifications but even by their shapes, sizes and colours including packaging. The import of brand names, curiously, is an integral component of import substitution projects.

Second, the created production that substituted imports, were in several cases not geared to the basic needs of the people. In fact many commodities produced were in use by a small segment

of the local population - the more affluent class which is backed by a much larger slice of the purchasing power.

An industrial planner must examine first of all whether the priorities assigned to industrial sub-sectors conform to the basic needs of a major part of the population.

Third, in many of the import - substitution - inspired industrial programmes, the domestic added value generated is small as a result of the continued import of semi-processed intermediates and components of relatively fairly high value. In a number of cases, the added value is ridiculously small, almost negligible. These are frequently cases where certain import is being substituted for another kind of import.

Import substitution product should be an essential commodity or one of mass consumption of a large section of the people unless:

(a) the domestic added value is high;

(b) the long-run overall foreign exchange effects are substantial; or

(c) the production technolgoy is well-known and does not call for specific import; or

(d) if production technology is imported, and a time-bound programme for acquiring technological self-reliance in the area is developed.

3. Export Promotion Strategy

This approach is further accentuated by considerations of foreign exchange problems. However, it has many other fundamental implications. The developing countries have, in the past, been exporters of prime commodities to be processed by the industrialized countries either for home markets or for exports, including exports to developing countries. The latter, therefore, have been importers of their own products processed by other countries adding a phenomenally high value. This constituted a substantial drain of resources. Since the international trade was in the hands of metropolitan powers which were importing the primary commodities, the prices paid were too low. This is vividly demonstrated in the low prices paid in the past for oil which led to excessive and extravagant use of the non-renewable resources. The exports of manufactured products from the countries producing the base feedstocks enables them to earn the added value which has multi-variate impacts. It increases the employment opportunities besides increasing the national income.

Because of the increasing demands of developing countries of their slow but steady emergence as buyers of manufactured products, expanded needs of development and the impact of escalated energy prices, most developing countries have been undergoing chronic balance and payments deficits. This has also led to the urge for export promotion. The export promotion effort gives the exposure of their economic systems to world trends and forces them to be increasingly productive. It impels them to attain ever-higher levels of technological capability.

Export promotion efforts pursued indiscriminately could be highly expensive. In many cases, exports would need support through cash subsidies or other measures.

The selection of the components of the export sector calls for an in depth analysis and evalutation. In conducting the analysis, necessary adjustments have to be made, on the one hand, for the support extended in the form of remission of import duties and concessional pricess of infrastructural services, on the other, of transfer burdens which the export sector carries without getting the refunds paid as import duties on capital and equipment. Moreover, the industrial

planner should reckon with the problems connected with the creation of extra production capacities for exports:

1. The acceleration of exploitation of non-renewable mineral resources, necessary for processing of commodities for export could lead to their depletion.
2. The exports of processed agricultural products might create serious food shortages at home.
3. The exports of manufactured products would entail extra capital costs, some of which will have import content, such as technology, machinery and equipment, spares, as well as current costs for the import of intermediate, semi-processed products and foreign labour forces. This could also lead to retarding the process of endigenous industrialization.
4. The international markets are subject to substantial oscillations. Therefore, if the market penetration cannot remain stable, the new capacity created might remain idle stirring extended distortions.
5. The increasing protectionism in developed countries tend to reduce the eventual advantage obtained by building up extra capacities for export. This tendency is evident to be reinforced due to the depth of the present crisis.

Nothwithstanding the problems encountered in building up an export market, the developing countries have penetrated it

increasingly with selected commodities. In the matter of selection of the products, the industrial planners will have to ensure that the candidate country has a distinct advantage inentering the chosen area, which could be based on the right type of natural resource availability.

In the area of export build-up, the joint co-operation among the developing countries could be of immense value. The countries could enter into bilateral, triangular or multi-laterial deals. Illustratively, a country having rich deposits of bauxite can produce alumina; one having cheap energy could convert alumina into aluminium; one having developed metal working and engineering industry could produce the down-stream fabrications and products. This type of co-operation will be helpful in installation of large sized plants taking full advantage of economies of scale - and not merely of the factor endowments.

4. Resource Utilization Strategy

Import substitution and export promotion strategies have always a disadvantage if linked with the international trade configurations. A more organic approach is linking production to the national resources. In this way import substituted or export oriented production will establish better linkage with primary producing sectors, such as agriculture and mining.

However, in order to gear industrial production to resource supply in the country it is of extreme significance that the planners choose the appropriate commodities which could be produced on the basis of abundant domestic resources.

Industrial production is characterized by a flexibility in the methods of production to produce each commodity, the design or form of the commodity produced and the inputs required for their production. For example, textiles could be produced on the basis of different technologies ranging from handlooms to highly automated looms. They could be produced in different forms and from different materials, for example natural or artificial fibers.

There exists a countless number of possibilities for mutual substitution not only among inputs necessary to produce a certain commodity but also among commodities of a certain use value. For example, demand for personal transportation could be met by personal cars or by providing means of public transportations, such as buses and trains.

The scientific technological revolution has widened substantially the number of such alternative variants of inputs and commodities.

This is, infact of great importance for developing countries, because it enables them to produce commodities which are geard principally to the resource supplies of their countries on the one hand and to produce final output through appropriate structure of industrial production. In this respect the planner has to choose the optimal variant for the country. This variant will, of course, be the one that provides the greatest use of domestic raw materials and the greatest effectiveness of production process. In this way strong linkages could be established with the primary sectors of the national economy which leads to the strengthening of the self-reliant and self-sustaining growth.

It is worthwhile mentioning here that deciding on products imitated to those produced and consumed in developed countries may have negative effects on the economy in the long run. This is due to the fact that improted technology required to produce such products, particularly those well-known ones produced by transnationals are usually concluded under a number of conditions which are necessary from the point of view of the foreign corporations to protect their quality standards. A substantial part of inputs necessary for their processing must be imported because country usually cannot provide these inputs with the required specifications without deteriorating the quality of the final product. This usually leads to other kind of independency and shifting imports from the product to the intermediates. Thus, creating backward linkages with certain corporations in the outside

world instead of having the liberty in purchasing the final commodity from various sources. For further details see the Annex (Choice of Appropriate Commodities and Inputs).

The following two factors account for the high ratio of imported inputs:

1. In many cases the domestic value added generated is very small and cannot be expanded due to difficulties connected with creation of industrial prerequisites necessary for the production of semi-processed intermediates and components of relatively high value.

2. The prices of imported intermediates are controlled by forces outside the country which usually increase faster than those of the final products which are decided within the country.

The introduction of industries which depend heavily for their inputs upon imports may lead to greater dependency upon sources firmly controlled by factors outside the country. Common examples in this connection is the establishment of assembly lines for consumer durables, such as automobiles, air-conditioners, washing machines, television sets, without having a possibility of creating relevant feeding intermediate and basic industries. Moreover, sometimes the introduction of sophisticated consumer goods industries induces demand on their output due to the protection and other ercouraging policies with a result that spendings on imported inputs will be higher than what would result from the imports of the product.

Therefore, developing countries must make great efforts to avoid shifting from the import of finished product to the import of their intermediates required to produce these commodities. In this connection developing countries must take necessary measures to encourage the creation of relevant institutions, information services and appropriate R + D in order to identify the appropriate commodities and intermediates which permit more use of domestic materials. For example, the use of abundant wheat or rice straw for paper production, particularly in areas where timber is imported or insufficient or the use of bagasse for the production of bricks and other construction materials to substitute fuel. Another example would be the use of naptha or associated gas with oil to produce sponge iron instead of importing coal. In many cases the use of local raw materials and intermediates requires design adaptation. For example, industrial and residential buildings in some rural areas should be designed in a way that permit the use of locally abundant raw materials or agricultural by-products. In this connection policies should be formulated to encourage the consumption of adapted products. For example, by subsidising their production or charging high customs duties on the imported commodities with similar use value.

Finally developing countries must link as much as possible of the industrial capacities to the abundant raw materials in the country. For example, in cases where timber is sufficiently available, the planner must encourage the utilization of timber as much as possible to produce construction materials, furniture, paper and other commodities. In cases where huge electrical power could be generated from electrical-hydro stations, high energy-intensive industries and processes should be established to produce iron and steel, aluminium, and different metallurgical processes.

5. Choice of Appropriate Technology for the Industrialization Process in Developing Countries

One of the most cruical problems in planning industrialization process in developing countries is to decide upon the pattern of production methods to be used in the industry, namely the choice of appropriate technology. In the question of choice of technology for industrialization process the planner must deal with a number of connected issues which are involved in this matter, such as mobilizing resources, especially surplus labour, the order of priority to be assigned to different industries or sectors, their relative rates of growth at particular periods and the choice of methods of production in the industry, namely the choice between labour-intensive and capital - intensive types of technology.

The choice of technology is in fact a central problem in industrialization of developing countries and on the choice of the right technology, the efficiency of the whole industrialization process depends in the long run.

The Labour - Intensive Technology

Labour - intensive technology is characterized by relatively high incremental labour - capital ratio $(\Delta L/I)$ [1/] which means that if this technology would be applied, more employment opportunities would be offered compared with the capital - intensive technology. This aspect of the labour - intensive technology led many economist

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1/ For better comprehension of this section please refer to the annex.

and political leaders in developing countries to be in its favour. This is, of course, due to the fact that high unemployment, scarcity of capital and low investments are crucial problems in most developing countries. Therefore, the use of the labour - intensive technology was favoured to maximize employment immediately. Thus, for instance, instead of supplying a relatively small number of mechanical looms would be more urgent from the point of view of immediate employment to supply a host of handlooms capable of employing a lot of labour at a relatively low level of productivity.

The Capital - Intensive Technology

High productive up-to-date machines and equipment which represent modern methods of production are called capital - intensive technology. The introduction of this technology requires high levels of physical capital and lead to low incremental - labour capital ratio ($\Delta L/I$) and high incremental output - capital ratio ($\Delta Y/I$) compared with the labour - intensive technology. Modern technology is always oriented toward processing higher output per machine during a fixed time compared with traditional technology. In modernizing the production technology the volume of output do not vary in linear proportion to the costs of the machineries. In fact the output increases faster than the investment costs. For example, the materials and labour required to produce an outdated lathe do not differ greatly from those required for a modern lathe except for the electronical accessories. Whereas the productivity of the modern lathe (especially the semi-automated or fully automated) may in hundred times be higher than the outdated lathes. Thus, modern technology is always oriented toward intensifying the output with the result that the output per machine or per unit of physical capital and worker will constantly be higher. The differences between modern technology and traditional technology is much wider than those within successive technological generations.

Therefore, investment in capital - intensive technology would always use less labour and less capital per unit of output than would the process with low capital - labour ratio. This means that it would be possible to produce more output with the same amount of investment in fewer production units with much less employment if capital - intensive technology is applied. This, in fact explains why capital - labour ratio tends to increase as a result of technological improvements in accordance with the economic law of concentration of production and capital.

The Necessity of Capital - Intensive Technology for Restructuring the Industry

As it has been mentioned earlier the planner must decide on the ratio of output of means of production to that of consumer goods, i.e., the structure of the productive sector of production and of imports. For this ratio determines the allocation of net output (or income) for both consumption and accumulation.

New investment is equivalent to the imports and domestically consumed output of capital goods industries, whereas consumption is equivalent to the imports and domestically consumed output of the consumer goods industries.

One of the major deficiencies of the the labour - intensive technology consists in the fact that its application is limited mainly to consumer goods industries. For basic industries require certain machineries and equipment for processing, such as lathes, forging machines, furnaces and cranes. Iron, steel and petrochemicals materials cannot be produced on the basis of handicraft methods. Mechanical engineering requires certain levels of mechanization to ensure the minimum levels of quality. Experience shows that attempts to reduce the production technology of iron to a labour - intensive one on the basis of domestic furnaces was a complete failure. Thus, it follows that if labour - intensive technology is applied, then handicraft or "cottage industries" would be preferable to factory industry equipped with modern machinery and consumer goods industries to basic industries and hence a faster growth of consumption and slower one of investment which other things being equal, means slower increase of output in the long run and no chance in establishing the basic industries required for self-reliant and self-sustaining growth.

Choice of Technology and the Problem of Uemployment and Industrial Growth

In general the ratio of investment in most developing countries is low. This is partly due to low per capita income. Most of the national product is consumed individually and little is left for accumulation. However, the rate of investment in some developing countries can be increased on the expense of individual consumption

of the affluent segments which is backed by a much larger slice of purchasing power and which has adapted a rather wasteful style of living. But this problem is beyond the scope of these Guidelines. Therefore, we will assume that the rate of investment remains constant during the gestation period of major industrial projects within the designated plan period. However, once these projects start to operate, the investment ratio would be changed in accordance with the type of industry chosen. If basic industries were chosen, then the supply of capital goods will grow faster causing higher reinvestment ratio. The increased physical capital would be used to equip new additions to the labour force. Thus, in the long run output and employment can be maximized, (see the annex, some analytical observations on the choice of technology).

Problems Connected with the Introduction of Capital - Intensive Technology in the Sector of Consumer Goods Industries in Developing Countries

From the theoretical standpoint, as it was shown with the introduction of capital - intensive technology it would be possible to achieve high returns to labour and physical capital in the long run. However, experience shows that the application of capital - intensive technology did not help developing countries to reduce substantially unemployment and in many cases the capital - intensive technology was cited as a cause of growing unemployment.

But Why the Introduction of Capital - Intensive Technology in Developing Countries Can Cause Unemployment to Grow More Faster?

1. In most developing countries there exists a traditional sector producing consumer goods, such as footware, textile and food stuffs. The traditional sector is in fact labour - intensive. The means of production used in this sector are very simple, the production is scattered and with high level of employment.

In most cases in the initial stages of industrialization capital - intensive technology is introduced into consumer goods industries with the resultant ruin of the traditional sector.

Unemployment produced on this basis is typical in developing countries and can create serious problems. For example, the establishment of the BATA factory in Upper Volta created 100 jobs but ruined 5,000 traditional craftsmen.[1/]

1/ Gerard Destanne De Bernis: Some Difficulties of Industrial Planning. A working Paper presented at the Expert Group Meeting on Industrial Planning organized by UNIDO, Vienna 1 - 5 November 1982. P. 12

2. Allocating investment to consumer goods industries in the initial stages of industrialization does not provide for the expansion of physical investment capacity of the country. For new investment here are not just financial resources. Financial resources do not remove the bottleneck of physical capital resources in the country. Therefore, developing countries must, in the initial stages of industrialization concentrate upon methods and lines of production which will increase the investment potential appreciably. In so far as the limiting factor consists in the output capacity of the industries which produce cement, bricks, steel bars and sections, cables, machines and equipment as well as construction capacities to transfer them into productive capacities and infrastructure. In other words developing countries need larger output of the above-mentioned products with which to construct and equip (partly or completely) new factories, power plants, schools and hospitals.

Practical Lessons on the Choice of Appropriate Technology for Developing Countries

Notwithstanding the fact that capital - intensive technology is indispensable to create basic industries and to restructure the economy, as well as to accelerate the industrial growth, its spontaneous introduction might lead to undesirable consequences. Therefore, the application of capital intensive technology in developing countries should be carefully planned. In this connection the industrial planner must be able to:

1. Identify sub-sectors of the industry were the introduction of capital - intensive technology is necessary.

2. Plan the introduction of capital - intensive technology in a way to permit more employment and the utilization of more local raw materials.

However, it is unlikely that some universal recipe exists for planning the introduction of capital - intensive technology for all developing countries where local resources can be rationally allocated. Developing countries differ greatly with respect to per capita income, economic structure, population and factor endowments. For example, there are countries with low per capita income and very high surplus population such as India and Pakistan on the one hand and countries with extremely high per capita income and small population such as Kuwait and the United Arab Emirate on the other. Another extreme would be countries such as

Brazil and Mexico which have already relatively developed manufacturing sector and large markets, as well as R + D facilities tc develop products and processes. Therefore, it is difficult to find an appropriate technology which draws the frontiers of efficient combination of labour, capital and raw materials for all developing countries.

Exercise No. 1

In a developing country with very low per capita income, high surplus population and a well established traditional sector for consumer goods, the government has no definite concept about the introduction of capital - intensive technology. As industrial planner you are requested to consider for the government of this country an appropriate concept for the introduction of capital - intensive technology in order to create basic industries and maintain relatively high level of employment and relatively sufficient supply of consumer goods.

Please try to give sufficient argumentations and explanations for your concept before reading the comments below.

1. The introduction of capital - intensive technology in this country should in the first stages of industrialization be limited mainly to the basic industries. Here the limited savings in foreign currencies and foreign loans should be concentrated

mainly within the sectors of industry that can expand the domestic physical capital potential.

2. The traditional sector in this country which is labour - intensive should maintain its role in the economy. Some efforts would be needed to upgrade its effeciency. Research institutions and information services, both national and international are probably fruitful ways of encouraging more appropriate R + D.

3. Moreover, in this country basic consumption needs should be met as much as possible from labour - intensive processes. Here the patterns of consumption should be changed to facilitate more labour inputs. For example, instead of producing consumer durable, such as automobiles, washing machines and air-conditioners which need capital - intensive production, it would be appropriate for these countries to produce bicycle, launderers and coolers which need less capital - intensive technology.

4. Another way of encouraging the labour - intensive technology is to direct labour - intensive sectors toward exports. This, however, requires some careful investigations to identify labour - intensive goods and processes that have a comparative advantage in world markets. This is the way developing countries in South East Asia and to a lesser extent some Latin American countries have followed.

Exercise No. 2

In a developing country with surplus population, the government is determined to introduce capital - intensive technology in the basic industries. But the government is also intended to solve the problem of unemployment in the country. As an industrial planner you are requested to find solution for this problem.

Please try to find the appropriate solution of this problem before reading the answer below.

The contradiction between capital intensive-technology and unemployment can be overcome by stretching the capital - intensive technology possibly to the level of employment required.

Some Remarks on Stretching Capital - Intensive Technology in Developing Countries

Developing countries must find ways and undertake measures in order to encourage engineers, technicians and skilled workers to explore ways and methods to stretch the capital - intensive technology to the level of employment required. In fact there are always possibilities in which labour could be efficiently substituted for capital even if capital - intensive technology must be appleid. For example, during Japan's early industrialization when wages are comparatively low, machineries in textiles and other industries were utilized more intensively by running extra shifts. This caused more frequent halts for repair, but repair was again a labour

intensive activity and hence the overall effect was greater labour intensity and greater efficiency in the use of all resources. Thus, even in the process in which mechanization is necessary, double and triple shifts greatly decreased the overall capital - labour ratio. Similar capital- stretching labour intensive techniques are currently being used in some South East Asian countries in textiles, electronics, wood working and other industries. It should be pointed out here that there do seem to be plenty of opportunities for more labour - intensive methods to be used in countries with surplus labour. And there do seem to be opportunities for a more appropriate product mix. The ranges of choices are far from complete on both the production and product side. It is the task of the planner to spread consciousness among engineers and technicians to increase the range of choice. Even for products in which there may be technical rigidity in some main production processes, there are always perepheral processes such as materials handling and packaging which can be done efficiently with labour intensive methods, so that the overall production of product still has scope for a labour - capital substitution. Moreover, there are a number of assembly operations where more labour can be introduced if organized on sub-contracting or auxillary industry basis. It has been found feasible to do so in electronics industries in some labour-surplus countries.

Finally, the planner should bear in mind that there is a close relationship between process adaptation and product adaptation. In many cases adaptation of the processes requires product adaptation to make fine tolerances less critical and frequently to lower the general quality of the product. Here again the transnational corporations come in for their share in ciriticism since their reputations are frequently based on the quality of their products and they are reluctant to temper with that image. It is instructive to remember that some inventions, innovations and adaptations do occur in developing countries and there are a great number of cases were developing countries altered developed countries' machineries or processes to suit them to their conditions.

6. The Concentration of Investment and Production

In the industrialized countries production has been concentrating in large-scale plants which are characterized by utilization of modern capital - intensive technology and by requirement for large capital investments, a continuous flow of raw materials, energy, labour and vast markets.

The introduction of large-scale plants led to an unprecedented increase in the output - capital, the capital - labour and output - labour ratios. This is due to the fact that physical capital, labour, energy and raw materials increase more slowly than output. Some expenditures, such as design costs, civil engineering, buildings, links with power and transport net workers, etc. are to a large extent independent of the scale of production. Moreover, physical capital itself do not vary in linear proportion to productive capacity.

In chemical industry, iron and steel industry, food processing, cement industry and many other industries capital equipment are in the form of tanks, compressors, furnaces, gas holders and columns. The cost of such equipment is mainly a function of the materials used in enclosing a given volume, that is to say of the surface area of the item in question; whereas output is a function

of volume. In other industries, such as mechanical and electrical industries, the larger is the capacity the more specialized the more powerful and the more labour - saving is the equipment. Specialized equipment cannot be utilized effectively in small-scale production because of the limits in output and the flexibility required to produce a wider variety of products. The introduction of specialized equipment in large-scale production increases the tempo of production faster than the costs of equipment. (See the annex, the relationship between industrial capacity and production costs.)

Economies of scale result also from the repetition of similar production equipment enabling thus, to remove bottlenecks and to achieve appropriate proportions among capacities of different production units and production stages within single integrated production process. Moreover, the benefits from economies of scale are not only confined to the main production units but also results from different industrial services, such as provision of steam, repair shops, storerooms, as well as industrial infrastructure, such as connecting streets, rail roads, freight stations, ports, electric power installations and sewage system.

It should be pointed out here that in calculating the advantages of economies of scale, the planner must also take into account the losses connected with the increase of production capacities, such as transport costs of raw materials and finished goods which usually set economic limits to the scale of production.

Possibilities to Introduce Large-Scale Plants in Developing Countries

The establishment of large-scale plants in developing countries is of great importance due to their high effectiveness and economies in connection with the per unit capital of output which is mainly paid in scarce currency. However, their introduction in these countries is connected with two major constraints. First, the establishment of large-scale production presupposes the existence of a sufficiently large and easily accessable market which is practically lacking with respect to various products in a large number of developing countries. Second, modern large-scale production can function properly only if there are a number of allied sectors which provide power and necessary intermediates, process the by-products and transport the output. These facilities must be created in developing countries in order to establish large-scale

production with the result that the capital required for each enterprise would be immense.

Thus, the possibilities for introduction of large-scale production in developing countries is relatively limited, particularly at the initial stages of industrialization. Notwithstanding these facts, it is still better under the circumstances of developing countries to invest in a few large-scale projects instead of fragmenting investments among a large number of tiny ones. Moreover, it is also better to select a few large projects and concentrate on improving administration and organization to the extent required to facilitate the preparation, implementation and operation of these projects.

Therefore, the planner in developing countries must identify the possiblities for the establishment of large-scale industries. In fact there are always sufficient markets for industries with strong forward linkages even in small developing countries. For example, steel cement and refined oil products are usually in high demand. In addition the planner must envisage possibilities for further concentration of production capacities within main industrial complexes by including main downstream with upstream operations. For example, in the iron and steel industry, further

economies could be achieved in the establishment of integrated iron and steel works which embrace blast-furnaces, steel making furnaces, rolling mills, foundries, as well as different units for processing a number of by-products. Another possibility for further benefiting from the economies of scale is to conglomerate capacities of similar processes within single cites. For example, the creation of complexes to produce all kind of machines or different electrical equipment or all electronic equipment.

Finally, the introduction of large-scale plants must be planned carefully where an account should be taken on the non-productive aspects of the projects, such as the expansion required in the infrastructure, housing, social services and pollution.

Risks Connected with the Introduction of Modern Capital - Intensive Technology, Particularly into Large-Scale Industries in Developing Countries

1. There has been a tendency among many developed countries to confine production and hence exports of highly sophisticated technologies. In most cases it was proved that developing countries are not able to master or acquire these technologies which require certain professional experience and highly skilled labour, as well as necessary R+D facilities and other institutions that are built around collective technical, commercial, financial and scientific know-how. These technologies are usually patented and represented in the form "closed packages". They are rather expensive and lead to direct dependency.

Technological tie - ups are, of course, connected with additional costs for maintenance, spare parts and other critical intermediate products. Moreover, difficulties connected with the problem of mastering the technology result in low level of utilization. These factors taken together decrease the output - capital, output - labour and labour - capital ratios and hence offset the advantages of the capital - intensive technology and economies of scale.

Developing countries need standardized methods of production and standardized products which can be acquired by various sources in the world market including newly industrialized developing countries, such as India and Mexico. Standardized technology is much more easier to master adapt and further develop.

2. Developing countries frequently fail to properly utilize production capacities in the modern sector of the industry because of lack of skills and of deficiencies in organization and management of production, as well as insufficient inputs necessary for industrial processing or insufficient demand for final products, in addition to operational problems. Here again the standing idle of means of production lead to decreasing output - capital, output - labour and labour - capital ratios of new investments.

In this way the use of capital - intensive technology and the introduction of large-scale industries are linked with enourmous losses.

3. The introduction of capital - intensive technology in large scale- industries in developing countries requires the provision of certain environment necessary for its proper functioning, such as appropriate planning and organizational methods and above all training of workers.

Large-scale industries must be the main centres for large-scale training in developing countries. In this connection the construction of large-scale complexes can provide mass "on the job training" for workers to be recruited upon completion in the production.

At present transnational corporations prefer to conclude contracts for the supply of very modern technologies with developing countries on "turn key basis". In such contracts skilled labour and material supplies are usually broght from foreign sources which are at the corporations disposal.

For developing countries the construction process of industrial factories, particularly large-scale complexes is extremely significant

to create the national basis of skilled labour and essential openings for capital goods marketing.

Small-Scale Industries and the Efficiency of Industrialization [1/]

The possibilites of establishing large-scale industries in developing countries are limited because of their huge capital requirements for production process and infrastructure required therefore, as well as social infrastructural establishment usually linked with large-scale industries, such as housing, schools and hospitals. Therefore, large-scale industries can play significant role in developing countries within the key sub-sectors which have very strong forward linkages.

At present small-scale industries in developing countries are concentrated mainly in food and clothing industries, footware, textile industries, construction, and some construction materials, furniture, wood processing, ceramics and metal-working industries.

Small-scale industries can play decisive role in the initial stages of industrialization if the division of labour within the

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1/ Small-scale industries are production units utilizing modern capital - intensive technology. Therefore, they differ from "cottage industries" and handicrafts which are base on labour-intensive technology.

industry is well organized. In this connection the industrial planner must identify the fields where the operation of these industreis can be most effective from the overall development of the country on the one hand and organize these industries in a way to improve their economies on the other. These include:

1. The modernization of the rural sector calls for launching a vigorous programme to promote small-scale industries within the agro-industrial sub-sector in order to process agricultural resources such as cereals, fruits and vegetables, oil-seed plants, cotton, animal and fish.

2. Small-scale industries should be organized to perform special operation or turning parts for the large-scale plants as a sub-contractor, or to perform downstream operations to produce final products, such as plastic products, steel furniture, paints, clothes and footware. These industries are tiny and scattered. In this respect the private sector in most developing countries can play a decisive role to process a great deal of output produced by key large-scale industries.

3. The function of small-scale industries must be different from that of handicraft and other production units which utilize labour - intensive technology. In this respect the industrial planner must identify the fields where these units may play important role in further meeting the demand of people for consumer goods.

4. To facilitate higher efficiency for small-scale industries it is instructive that the government in developing countries establishes industrial districts. Industrial districts must be connected with rail roads and highways, must provide the industries with fresh water, and electricity and steam from central generating

plant. Moreover, industrial districts must have training centre to service a number of occupational trades represented in industries in the district, and a R and D facilities promotion of these industries. Industrial districts must provide banking services and must have warehousing and post services, as well as custom and excise office, social centre and welfare facilities. In this way small-scale industries can benefit from economies of scale within the industrial infrastructure and industrial services. Thus, industrial planning can induce industrial growth at selected locations where they prove to have optimum advantages from the overall economic point of view.

Conclusions

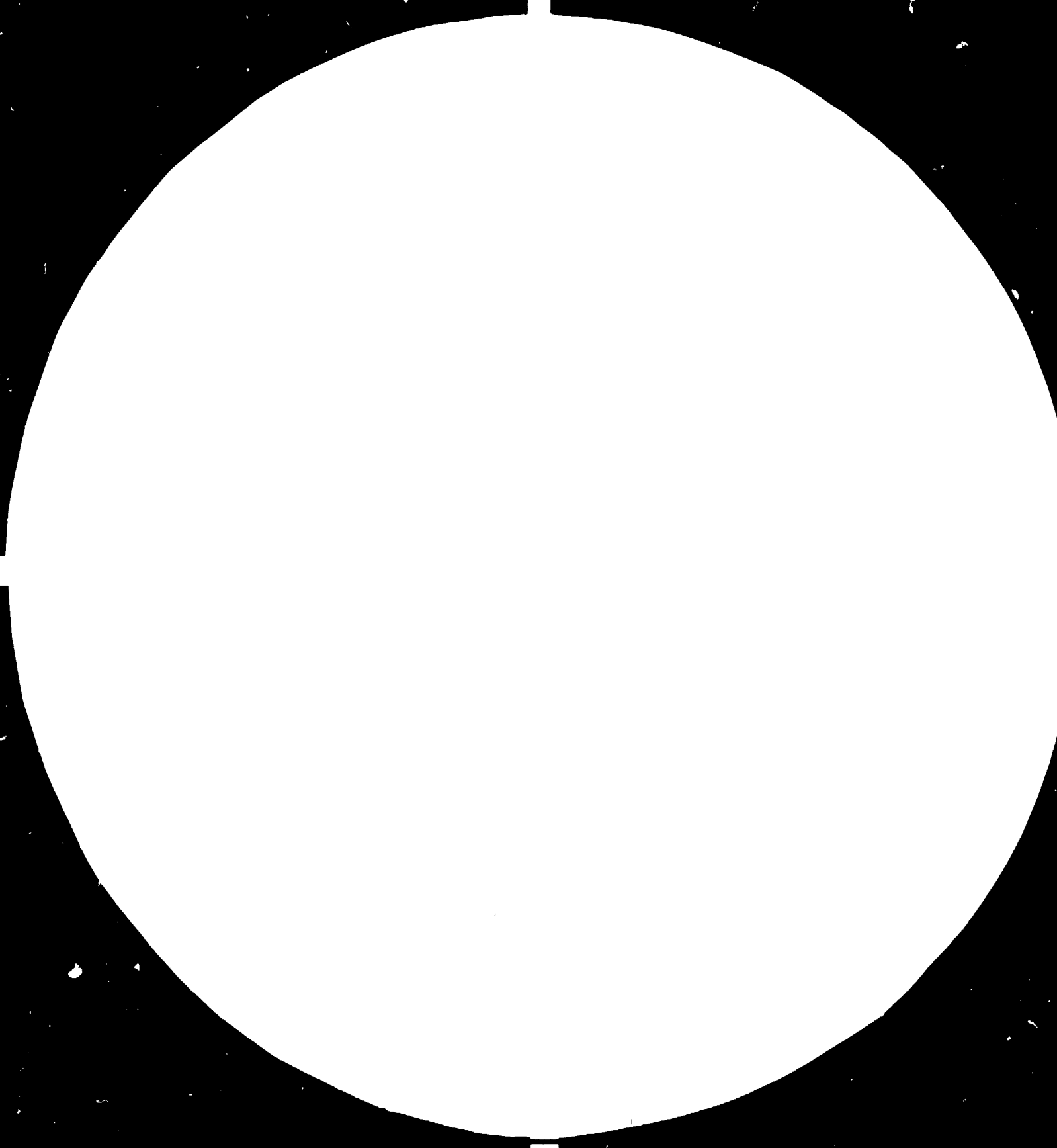
The industrial development strategies constitutes the overall structure within which it should be oriented if it is to bring about purposeful industrial development. There are a number of industrialization strategies for developing countries, the central and most significant of which is the self-reliant, self-sustaining growth strategy. This trategy focuses mainly on the establishment of the basic sub-sectors of the industry to ensure a sustained industrial growth on the basis of the production of these sectors which constitute virtually the internal physical accumulation.

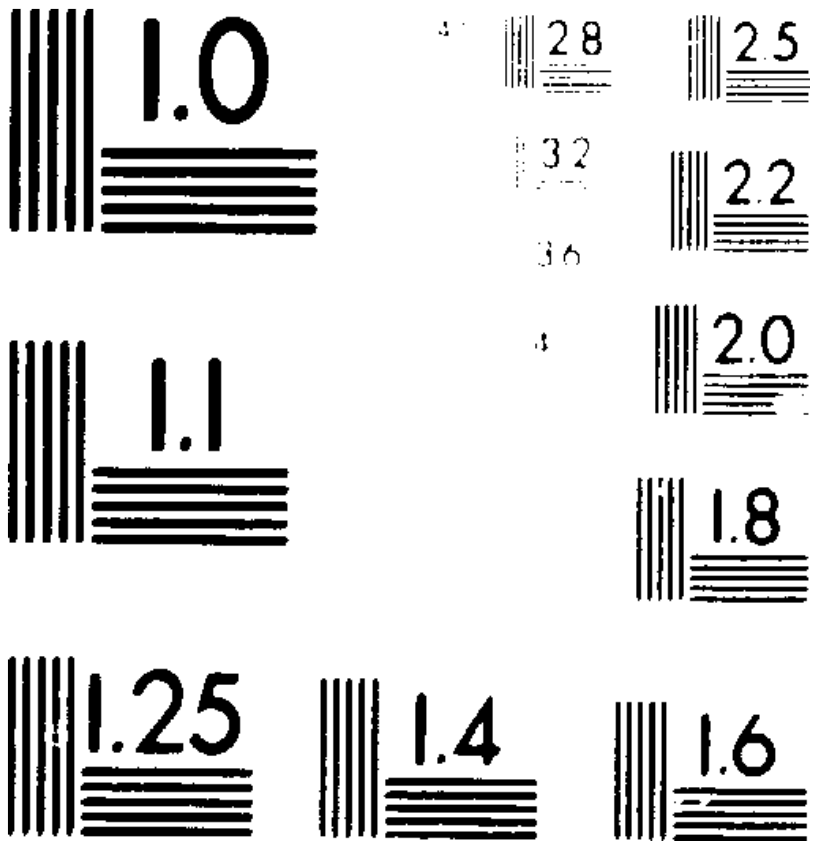
The significance of import substitution and export promotion strategies is connected with establishing marketing possibilities of the output. However, both strategies have some distinct handicaps and deficiencies in industrial planning practice in developing countries. In fact the main disadvantage is the possible technological dependence upon foreign countries for technology, raw materials and other intermediates. In addition, export oreinted strategy might create the following problems:

the acceleration of exploitation of non-renewable mineral resources, create food shortages at home, re-exports of imported production inputs, and the risks connected with the oscillations in the world market and the increasing protectionism in developing countries which might lead to idle stirring of the export capacities.

The resource utilization strategy is a more organic approach. This strategy is of extreme importance due to linking the production to the national resources. In this way import substituted or export oriented production will establish better linkage with primary producing sectors, such as agriculture and mining. In this respect industrial planner must be able to choose the appropriate commodities, processes and inputs in order to provide the greatest use of domestic raw materials.

While the introduction of capital - intensive technology into the basic industries is of crucial importance for restructuring the economy and for accelerating economic growth, its introduction into consumer goods industries might compete with the traditional sector and cause its ruin on the one hand and cannot lead to further economic development on the other. Therefore, the intro-





duction of capital - intensive technology must in the initial stages of industrialization be limited mainly to the basic industries. However, with the expansion of the national industrial basis and increase of output in the form of physical capital, more and more productive activities should be equipped with capital - intensive technologies. Moreover, the introduced capital - intensive technologies must be stretched to the level of employment required.

The major public investment in the industry must be concentrated within few large-scale key industries instead of fragmenting it among tiny ones, in order to achieve high output - capital and low input - output ratios on the one hand and to concentrate on improving the preparation, implementation and operation of these of these projects on the other. However, small-scale industries can play decisive role in industrialization if division of labour within the industry is well organized. This include the following considerations:

a) Small-scale industries must operate in areas where the introduction of large-scale plant is not economically justifiable, e.g., to produce final consumer goods or in rural areas to process agricultural resources.

b) The production of small-scale plants must be integrated with that of large-scale plants to strongly develope industrial interlinkages within the national economy. In this respect small-scale industries should perform various downstream operations to process intermediates produced mainly in key large-scale projects.

c) The functions of small-scale industries must be different from that of handicraft and other production units which utilize labour - intensive technology. In fact in developing countries, particularly with surplus population and relatively developed handicrafts and cottage industries, the labour-intensive production must be encouraged to to meet as musch as possible of the demand for consumer goods.

d) To facilitate higher efficiency for small-scale industries the government must establish industrial districts to provide relatively cheap industrial services, and infrastructural facilities.

ANNEX

Some Quantitative Aspects of Resource Allocation for Industrialization Process

Accumulation is the prerequisite for expanding productive capacities. Accumulation is refraining from using resources for consumption purposes. But it is also possible that countries can borrow accumulation from others or can receive them as gifts. Accumulation in physical form occur when some part of national product is not used up in current consumption, but is kept in inventory to be consumed later, or is used up in producing other goods and services. Accumulation can be hoarded or loaned out, can be used immediately for capital formation purposes, or can be kept for future use.

Capital formation is the process of utilizing the part of accumulation in the form of goods to expand the production capacities. Part of the accumulation will be used in form of working capital, such as fuel, semi-finished materials and other inputs necessary for industrial processing. Total accumulation required for creating new industrial production capacities and working capital during one year is called "current investment" or "new investment". The volume of the current investment in the industry and the efficiency of utilization of the current or total (the existing and new) industrial production capacities determine to a high degree the growth of industrial output.

New investments in the industry creates employment opportunities. However, employment in the industry is not a linear function of investments. The level of employment depends upon the volume of investment and the efficiency of the used technology , as well as the type of technology.

In the following we will introduce some important planning ratios which can be used to closely examine the problems of resource allocation and growth in industry. These ratios are widely used in the planning practice and with their help it is possible to identify the dependence of growth in manufacturing value added on the investment and employment into different industrial sub-sectors and on the type of products and inputs required therefore. Some of these ratios are also employed as criterion for evaluating the economic effectiveness of individual projects.

The Ratio of Investment to Total Net Output or Income (I/Y)

The ratio of investment to total net output or income: i.e., the proportion of resources devoted to adding to the existing stock of capital equipment plant and buildings to income or net output. In this form the ratio refers to net investment or new investment (I) and is equivalent to the imports and domestically consumed output of the capital goods industries over and above what goes to replace worn out equipment or used up stocks. It needs, therefore, to be related to net national income or net output (Y): i.e., total output (or income) after deduction for capital depreciation run down during the year in question.

The Capital - Output Ratio (K/Y)

The capital - output ratio)or sometimes called the investment - output ratio) expresses simply the relation between the value of total capital used (K) and the value of net output in one year (Y). It will vary from industry to industry and also change overtime, e.g., as a result of technical changes and the precise character of technical change. As a ratio for a country as a whole, it represents an aggregate of numerous different ratios for particular industries and other sectors of the economy and one has always to remember that this aggregate ratio may be high

or low according to which industries preponderate in the country in question. The ratio may be affected by the intensity with which capital equipment is utilized. If some of it is standing idle or is only used intermettently (in other words there is excess capacity) it will tend to be on the high side. If on the contrary the equipment is used effectively it will tend to this extent to be low.

Incremental Capital - Output Ratio ($I/\Delta Y$)

The incremental capital- output ratio expresses the relation between net investment or new investment (I) and the value of the additional output (in one year) over and above that produced during the previous year (ΔY)

Capital - Labour Ratio (K/L)

The capital - labour ratio (K/L) expresses the relation between the value of capital used (K) and the number of total manpower employed.

Incremental Capital - Labour Ratio ($I/\Delta L$)

The incremental capital- labour ratio ($I/\Delta L$) expresses the relation between net investment or new investment (I) and the number of the additional employmed manpower (in one year) over and above the employed during the previous year (ΔL).

Labour - Output Ratio (L/Y)

The labour - output ratio (L/Y) expresses the relation between the number of active labour force in the country and the value of net output (in one year) (Y).

The growth of the output as a result of new investment is determined by the following two factors:

1. The investment ration
2. The incremental capital - output ratio.

Thus, the rate of growth of the economy (r) resulted from new investments could be expressed as follows:

$$r = I/Y : I/\Delta Y \quad \ldots\ldots\ldots\ldots \quad (3.1)$$

$$r = \Delta Y/Y \quad \ldots\ldots\ldots\ldots \quad (3.1^a)$$

Example No. 1

Let us suppose that national income in the country is equal to 100 million monetary units and that its investment ratio being 20 per cent, and the incremental capital - output ratio is 4. Required the growth rate of the economy.

$$r = 20/100 : 4/1$$

$$r = 0.05$$

The rate of growth of employment due to new investment could be expressed as follows:

$$r_1 = I/Y \cdot \frac{\Delta L/I}{L/Y} \quad \ldots\ldots\ldots \quad (3.2)$$

$$r_1 = \Delta L/L \quad \ldots\ldots\ldots \quad (3.2^a)$$

Example No. 2

We will expand example No.1 by assuming that in this country the number of active labour force is (1) million and the incremental capital - labour ratio is equal to 400 monetary units per labourer. Required the rate of growth of employment due to new investments.

$$L/Y = \frac{1,000,000}{100,000,000} = 0.01$$

$$\Delta L/I = 1/400 = 0.0025$$

$$r_1 = \frac{0.2 \times 0.0025}{0.01}$$

$$r_1 = 0.05$$

Input - Output Ratio (W/Y)

The input - output ratio (W/Y) expresses the value of inputs (W) needed to produce net output (Y) in one year. The smaller the input - output ratio the larger is the net output for the less is the consumption of inputs during the processes of production the larger is the net output which lead to direct growth of industrial output.

The Reinvestment Ratio (I/K)

The reinvestment ratio expresses the relation between the value of net or new investment (I) and the total value of capital used (K).

Choice of Appropriate Commodities and Inputs

The negative impact of increased intermediate imports as a result of substituting the import of the final product could be demonstrated on the basis of the following equation:

$$X_i = MVA_i + W_i \quad \ldots\ldots \quad \ldots \quad (3.3)$$

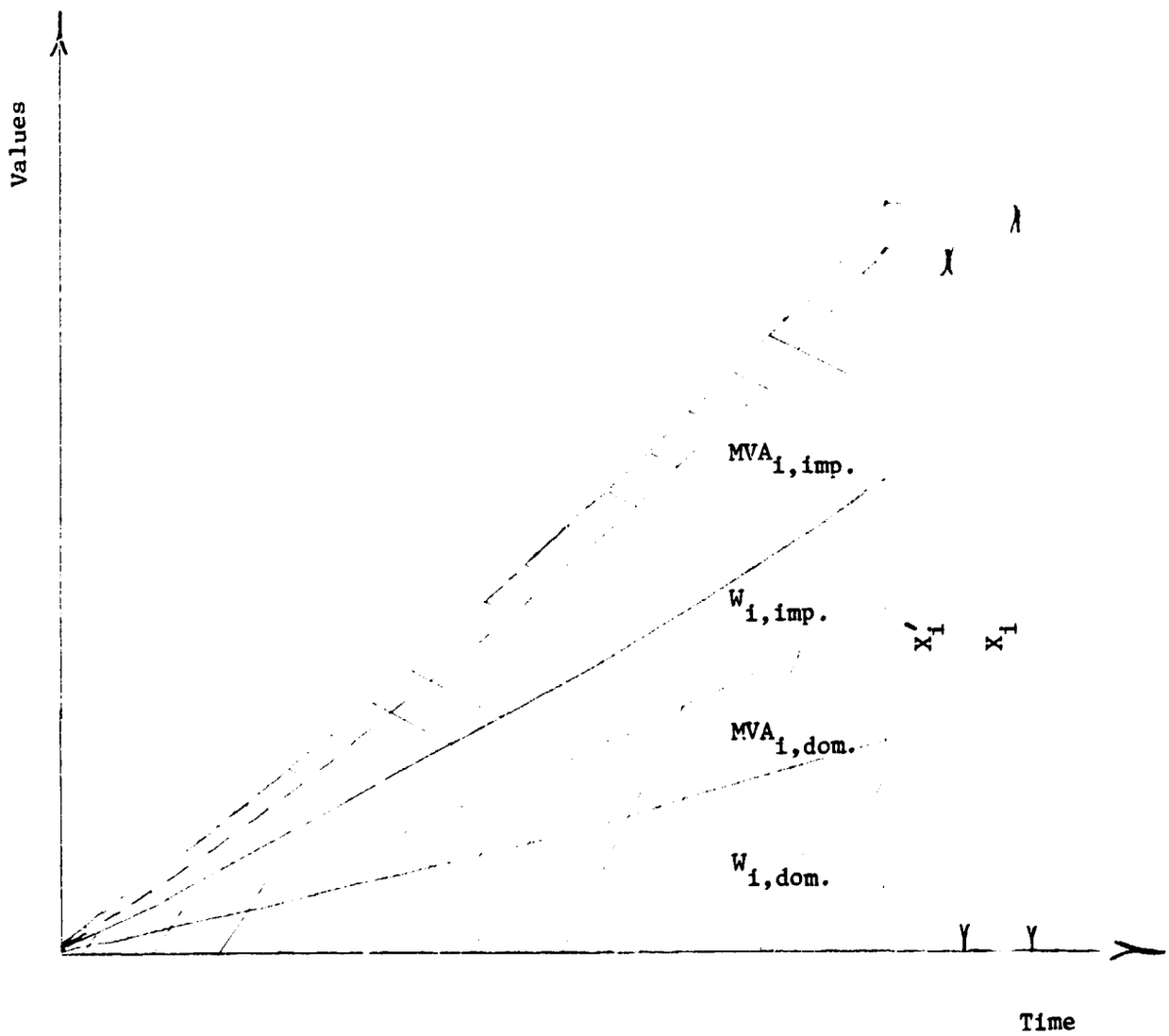
where X_i is the value of output of the sub-sector (i), MVA_i manufacturing value added originated in the sub-sector (i) and (W_i) is the value of intermediate consumption of the sub-sector (i). Part of intermediate consumption is imported ($W_{i,imp.}$) and the other part is produced domestically ($W_{i,dom.}$). The value added originated in the sub-sector (i) contains different components in foreign exchange, such as depreciation of imported machineries and wages of foreign skills. Thus, here again we have value added originating from domestic sources ($MVA_{i,dom.}$) and manufacturing value added originating from imported sources ($MVA_{i,imp.}$).

Now we assume that the value of substituted product in the world market is (X_i). Whereas (X_i) might be smaller or larger than domestic value of these products (X_i) because they are determined independently. Moreover, the direct benefit from import substitution

is equal to the value added originated from domestic inputs. The direct benefit would be maximum if the imported components would be zero and diminishes by the increase of the latter as shown in the inequality below (see also Figure No. 3.1)

$$o \leq (X_i^{\wedge} - W_{i,imp} + MVA_{i,imp}) \leq X_i' \ldots\ldots \qquad (3.4)$$

Figure No. 3.1



Some Analytical Observations on the Choice of Technology

The analysis of the choice of technology must start with the ratio of output of means of production to that of consumer goods. This ratio determines the allocation of net output (Y) to both consumption (C) and accumulation. For convenience we assume here that accumulation is totally used in new investment (I).

$$Y = C + I \quad .... \quad ... \quad (3.5)$$

If basic industries were chosen then the supply of capital goods will grow faster causing higher reinvestment ratio (B).

$$B = \frac{I_1}{K_o} \quad .... \quad ... \quad (3.6)$$

$$L_1 = Y_1 - C_1 \quad .... \quad ... \quad (3.5^a)$$

$$B = \frac{Y_1 - C_1}{K_o} \quad .... \quad ... \quad (3.6^a)$$

Wheareas (1) indicates the year (t_1) and (o) the base year (t_o). In the nominator the difference between net output and consumption would be higher in the case of basic industries than labour intesnive industries due to the increase of capital goods output which are physical investment sources on the one hand and relatively less requirements for labour and hence relatively less wages and consumption. Thus, investment ratio could change in favour of investment if the output is higher.

Let us now assume that the duration of gestation period is one year. Then in the next year investment of I_1 = BKo is added to the initial stock of capital Ko. Therefore, stock of capital in the next year (K_1) will be:

$$K_1 = Ko + I_1 \quad \ldots \quad \ldots \quad (3.7)$$

$$K_1 = Ko + BKo \quad \ldots \quad \ldots \quad (3.7^a)$$

$$K_1 = Ko\ (1+B) \quad \ldots \quad \ldots \quad (3.7^b)$$

From equation (3.7^b) it is obvious that chanelling investment into basic industries will lead to the expansion in stock of capital. This means virtually expanding factories, roads, ports, etc. and therefore, facilitating more production.

The net output or income in the next year (Y_1) will be:

$$Y_1 = Yo\ (1 + r) \quad \ldots \quad \ldots \quad (3.8)$$

Where Yo is the value of net output in the base year.

$$r = Io/Yo : Io/\Delta Y \quad \ldots \quad \ldots \quad (3.1) \text{ (repeated)}$$

$$Y_1 = Y_o\ (1 + I/Y : I/\Delta Y) \quad \ldots\ldots \quad \ldots \quad (3.2) \text{ (repeated)}$$

From equation (3.2) it is obvious that investment in the capital - intensive technology leads to higher grwoth of net output, because of the relatively small value of incremental capital - output ratio ($I/\Delta Y$).

Finally, the number of jobs in the next year (L_1) will be:

$$L_1 = L_o\ (1 + r_L) \quad \ldots\ldots \quad \ldots \quad (3.10)$$

Where (L_o) is the number of jobs in the basic year.

$$r_L = I_o/Y_o \cdot \frac{\Delta L/I_o}{L_o/Y_o} \quad \ldots\ldots \quad \ldots \quad (3.2) \text{ (repeated)}$$

$$L_1 = L_o\ (1 + I_o/Y_o \cdot \frac{\Delta L/I_o}{L_o/Y_o}) \quad \ldots \quad (3.11)$$

(L_1) could also be calculated on the basis of the following equation:

$$L_1 = \Delta L/I_o \cdot K_1 \quad \ldots\ldots \quad \ldots \quad (3.12)$$

$$L_1 = \Delta L/I_o \cdot K_o\ (1 + B)$$

Because of low incremental labour - output ratio capital - intensive technology in the initial stages of industrialization less labour would be required in comparison with the labour - intensive technology. However, with the development of the industry, the total capital and reinvestment ratio will increase faster ca.sing higher employment rates in the future.

Example No. 3

Let us assume that national income in the country in the year (t_o) is equal to 100 million monetary units, the investment ratio being 30 per cent, the number of active labour force being (1) million. The planners are considering tow technological options. The first is capital - intensive technology (I) and the second is labour - intensive (II) with the following average indicators:

	I	II
$\Delta I / L$	4	8
$\Delta I / L$	400	250

Required:

Net output and employment in the year (t_1) for both options.

The rate of growth of income and employment for both options are as follows:

$$r_I = \frac{0.3}{4} = 0.0750 \qquad r_{II} = \frac{0.3}{8} = 0.0375$$

$$r_{LI} = \frac{0.3 \times 1/400}{1{,}000{,}000/1{,}000{,}000} \qquad r_{LII} = \frac{0.3 \times 1/250}{1{,}000{,}000/1{,}000{,}000}$$

$$r_{LI} = 0.075 \qquad r_{LII} = 0.12$$

Net output and employment in the year (t_1) are as follows:

$Y_{1I} = 100\ (1 + 0.0750) = 107.50$ million monetary units

$Y_{1II} = 100\ (1 + 0.0375) = 103.75$ million monetary units

$L_{1I} = 1\ (1 + 0.75) = 1.075$ million workers

$L_{1II} = 1\ (1 + 0.12) = 1.120$ million workers

The Relationship Between Industrial Capacity and Production Cost

In practice the six-tenth rule is usually used for comparing investment costs required for different capacities. If for example, Y_A and Y_B are the capacities of two plans A and B, and I_A and I_B the respective investment costs then:

$$\frac{I_A}{I_B} = \left(\frac{Y_A}{Y_B}\right)^x \qquad \ldots \qquad \ldots \quad (3.13)$$

where (x) is a coefficient representing economies of scale. For example, in the case of spherical container area varies with the volume, and thus the capacity to the power of 2/3.

Example No. 4

The capital investment required for the construction of steel mill with an annual capacity of (100) thousand tons is 100 million monetary units.

Required:

1. Calculate the capital investment required for a mill with an annual capacity of (200) thousand tons.

2. Calculate the capital - output ratio for both mills.

$$L_n I_A = L_n (100) = 2/3 (L_n (200) - L_n (100))$$

$$L_n I_A = 4.6052 + 2/3 (5.2983 - 4.6052)$$

$$L_n I_A = 4.6052 + 2/3 (0.693117)$$

$$L_n I_A = 5.0672779$$

$$I_A = 158,741,600.0$$

$$I_{100}/Y_{100} = \frac{100,000,000.0}{100,000.0} = 1000.0 \text{ monetary units/ton}$$

$$I_{200}/Y_{100} = \frac{158,741,600.0}{200,000.0} = 793.708 \text{ monetary units/ton}$$

CHAPTER III

THE BASIS FOR INDUSTRIAL PLANNING

IN

DEVELOPING COUNTRIES

Plan of Chapter III

The Duration of Industrial Plans

In practice there exist various durations for different industrial plans. Generally three types of industrial plans are distinguished: Annual, medium -term and long-term. While all these plans represent instruments for achieving industrial development, the differences in their duration are related to their specific functions which have to be exercised within specific time periods.

Medium - Term Industrial Plans

A four to six years plan period is usually regarded as medium - term plan. In the practice the most typical industrial plan is one of five years. Experience indicates that five years for industrial plan is short enough to permit reasonably accurate projections and estimates to be made on the one hand and long enough to cover the gestation period of most of major industrial projects on the other.

Medium - term industrial plans constitute the principal form of industrial planning. They comprise more details than

both annual and long-term plans. This is due to the fact that they determine the major directions, objectives and tasks of industrial development as well as the dynamics of industrial growth. Moreover, they present the principal link within the entire industrial planning process. Therefore, they must ensure an organic continuity together with annual and long-term plans. In fact each medium-term plan must be conceived as a necessary step for the realization of a certain stage of the long-term plan. This, of course, requires the employment of the same methodology for all these plans on the one hand and the unity in content of the major sub-sectors on the other. It is along this line that medium-term plans must serve as a means to specify and correct long-term plans. And annual plans must in turn serve as means to correct and adjust medium-term plans.

In some developing countries medium-term plans are substituted by short-term plans lasting two to three years. These are mainly countries in transition period from colonial status to that of independent or countries in a state of emergency.

Short-term plans are not desirable, above all, because they are too short to cover the gestation periods required for major industrial projects. Their role in influencing industrial development is limited since they do not provide adequate

opportunities for mobilizing resources and cannot be used effectively to bring about basic structural changes.

Because of the limitations of short-term plans, central planning body in developing countries where no medium-term and long-term industrial plans exist must make serious efforts to create the necessary prerequisites to shift to medium-term and long-term planning.

Long Term Industrial Plans

Planning experiences show that for planning industrial development the period of five years is too short to bring about qualitative changes in the industry. A number of projects cannot be fixed into medium-term plans, because they need longer planning periods. For example, in the case of complexes for capital goods industries which are to be built in stages, or because their realization is completely dependent upon key projects under construction. Moreover, long-term industrial plans are of extreme importance for the definition of the objectives of industrialization policy over prolonged periods of time and for formulation the strategy of industrialization.

Long-term plans are attempts to look far into the future. They have less targets and contain less details than the medium-term plans. Their targets are based on only rough approximations of the likely supply of and the demand for physical resources as well as skilled labour and technicians. On this basis they can give a good enough ideas of priorities to enable planners to concentrate upon the most effective industrial sectors in preparing medium-term plans. They can also indicate long enough in advance in what areas per investment and other surveys will be required before specific projects and programmes can be formulated. They can also indicate shortages of technicians and skills which would constitute serious bottlenecks to long-term development and would alarm the country to make substantial increases for vocational and traditional education facilities immediately.

Few developing countries adopted long-term plans at the start of their planning experience, almost all of them turned out to have been so inaccurate for the latter years of the plan period. This is of course closely linked with the whole planning practice in developing countries as we have shown in Chapter I.

Long-term industrial plan must be longer enough than the

medium-term industrial plan since the primary purpose of the appraisal is to give perspective to the medium-term plan. But because of high level of uncertainty which is attached to the longer-term plans in developing countries, projections ahead so far into the future become too imprecise. This was the case in many developing countries where it was found that it would be more convinient to reduce their long-term plans from 20 - 30 years to 10 to 15 years. In fact the period of 10 - 15 years is widely agreed upon among planning experts as appropriate for long-term plans in developing countries.

Annual Industrial Plans

Medium-term plans indicate total investment by sub-sectors for the entire plan period and the targets to be achieved at the end of the plan period. Therefore, they cannot be used as programmes of action in the intermediate years.

Annual industrial plans prove to be indispensable as instruments for detailing exactly what must be done to convert existing medium-term plans into programmes of action.

Few developing countries prepare annual plans because of lack of sufficient planning experience and required information.

Annual plans in developing countries are usually replaced by state budget which encompasses main investment allocations. However, the state budget does not represent adequate substitute for yearly plans. Here again the central planning body in developing countries must make efforts to prepare annual industrial plans.

Conclusion

A well functioning industrial planning process requires three types of industrial plans: annual, medium-term and long-term plans. These plans must ensure an organic continuity. They must be unifide in respect with their content and methodology.

The differences in the duration of these plans are related to their specific functions. Medium-term industrial plan constitute the principal form of industrial planning for it determines the dynamic of industrial growth. Long term industrial plans are required for the formulation of the strategy of industrialization and to enable the planners to concentrate upon the most effective industrial sectors in preparing medium-term industrial plans. Annual industrial plans are necessary to convert medium- term plans into programme of action.

Plan Goals, Objectives and Targets

There can be no rationality in choice of resources and their combination if there are no goals towards which purposeful actions are directed. Therefore, the normal course of plan preparation is to start with the setting of plan goals. The goals express the long-term aspiration of the society. For example, the main goal of industrial planning in developing countries is, of course "industrialization of the country". Many goals of the national plan can also serve as goals for the industrial plan. For example, "economic independence", "more equitable distribution of national income" and "improvement of standard of living".

The goals are usually broad and expressed in qualitative terms and are mainly the concern of long-term plans.

For the preparation of the medium-term plans and to a large extent long-term plans, the goals must be transfered into objectives after analysing the capability of the economy to carry them out. For example, the objective necessary to meet the goal of "improving the standard of living", would be the increase of industrial output of goods required by large masses

of people and the increase of productive agricultural and industrial employment, as well as increase of food production (indirectly through modernization of agricultural sector).

It should be pointed out here that in developmental exercise goals are almost constant over a long period of time; whereas objectives are subject to changes from time to time. This is because goals are to be achieved in the long run, while objectives must be achieved mainly within the medium-term plan period, hence they correspond to the relevant development state of the country. However, in the long run the successive realization of objectives must lead to their convergence with the goals.

To the extent that objectives can be made concreate they act as guidepost for the preparation of plan. The most effective way of giving objectives concreate meaning is by quantifying them whenever possible thereby translating them into targets. Otherwise, if objectives are largely expressed in terms of qualitative indicators alone the effectiveness of planning in guiding the process of production is reduced. For in such cases it is possible to reflect only general trends of socio-economic development but not specific outcomes. Such objectives always contain an element of uncertainty which often makes it difficult and sometimes even impossible to guide industrial processes in the corresponding areas through planning. It is worthwhile mentioning here that there are cases in which

a verbal description of a planned objectives is sufficient to identify its quantitative aspects. For example, "to completely remove unemployment", implies attaining a 100 per cent employment level. On the whole the industrial planner should quantify as much as possible of the objectives. Even qualitative objectives, such as the achievement of a more diversified industrial output, which are not directly susceptable to quantification may be reflected directly in investment targets for the production of few commodities, or inputs required for these commodities. Besides the target of manufacturing value added, an industrial plan may have investment, employment, export of output, import of input and other targets. Targets may be set for the region, sub-sector or to individual industries, projects or commodities; they may be set in physical units of output or input, such as kilo, ton, kwh, as well as in units of value such as dollar, pound, and frank. Finally, the plan is a document comprising both quantitative attainable targets within a given period and means, such as pysical, financial and human necessary for their achievement.

Setting the Goals and Objectives in the Practice in Developing Countries

The extreme importance of the plan goals and objectives calls for great efforts on the part of each developing country to clearly define its industrial development goals and objectives. The planners must constantly improve the design of objectives on the basis of past experiences gained from plan implementation and problems arising from poor performance of the economy. Moreover, the planners have to avoid typical dificiencies in setting goals and objectives in the practice, such as listing objectives which mutually inconsistent or failure to give good objective hierarchy or confusion of basic with secondary objectives.

Confusion of essential objectives with minor ones is typical in planning practice in developing countries. For example, the set of objectives may comprise the growth rate to be achieved and the completion of a certain project. Even in more sophisticated plans of some developing countries, the goals and objectives of the plan can be contradictory to each other in combination although each objective may

be logical itself. Frequently development plans do not distinguish between long-term and short-term objectives and between objectives and strategies necessary for achieving them which indicate the state of uncertainty about what it is to be expected from a plan.

In the following a very simple example will illustrate how planners must identify contradictory objectives:

Example:

Consider the following objectives, interalia, for medium-term industrial plan in a country with very low per capita income.

- a large increase of the basic industries.
- a large increase in standard of living.
- a large increase in employment.

Required:

1. Is each objective logical by itself?
2. Are these objectives harmonious in combination?

Please try to answer these questions before reading the comments below.

It is obvious that each objective is logical by itself. However, because of the low per capita income a large increase in the standard of living is bound to limit accumulation by

shifting resources from investment to consumption. Reducing the ratio of investment is contradictory to the objective of a large increase of the basic and heavy industries which requires a concentration of large investment. Concentrating on heavy industry which uses less labour than light industries will lead to restriction of the number of jobs.

In this case the planner must find a solution to maintain the necessary coherence among the objectives. For example in a number of countries it would be possible during the initial periods of industrialization the increase in the standard of living will be met through increasing agricultural production due to improvement of peasant's productivity on the basis of introduction of new organizational methods without large financial investments. On the other hand the choice of techniques in basic industry has to be such that relatively a large number of jobs will be created. This choice must take also into account the current skills of available workers and the coherence with the progress of training.

In such a way the planning body is warranted against any superficial appraisal of the problems to be solved and objectives can clearly be established.

> Thus, planning to be meaningful must involve enough knowledge of the behaviour of the objective economic factors to relate future actions to objectives. "Wishful thinking is not planning".

Definition, Choice and Priorities of Goals, Objectives and Targets of Industrial Plan in Developing Countries

> Industrial planner must bear in mind that a clearly defined goals and objectives which are in complete compliance with the country's needs and circumstances in the initial stages of industrial plan formulation is virtually laying a sound foundation for the whole process of industrial planning.

A precise defined industrial goals and objectives is logically the first component of industrial plan, since they constitute the basis for establishment of a warrant strategy for allocating investment resources among competing demands. Without a definition of industrial development objectives, projects and processes are likely to be chosen arbitrarily and policies and measures adopted to implement a plan are likely to be contradictory.

Who Must be Responsible for the Choice of Goals, Objectives and Targets?

Industrial development goals and objectives may be economic, such as those mentioned earlier, or political, such as the improvement of a country's prestige in future and military capacity. Due to the fact that industrial objectives involve political and economic considerations, the choice of goals and objectives and their priorities must be a joint responsibility of planners and policy-makers. Planners must consult policy-makers and inform them about the importance and the implication of each goal and objective, as well as contradictions that are likely to occur between different objectives. In this way the planner will be able to take account on the concerns of the policy-makers in plan preparation on the one hand and bound them to the plan implementation on the other.

However, the instructions given by the country's policy-makers can only have a general nature. Therefore, it is the duty of the planner to go from these general proposals into the set of objectives temporal within the planned period. Thus, while the country's policy-

makers assign to the planners the objective of establishing or expanding the basic industries to gradually meet demand of industrialization for capital output, the planner by formulating the plan will set a number of mutually interrelated targets and indicators which are related to the programme for developing domestic basic industries. These in turn include forecasted estimates of development in domestic demand for these products in connection with financial accumulation and the rate of investment, as well as the degree to which the country is oriented toward establishing economic national independence.

In practice the planners cannot quantify and elaborate all these objectives on the level of central planning body. Otherwise, they will be unrealistic. Therefore, the calculations of targets must be made in collaboration with the Ministry of Industry, relevant enterprises and other institutions as well as in consultations with the working people and private enterprises. It is worthwhile mentioning here that the calculations of targets cannot be done in one operation. For their magnitudes depend by large upon many other targets and inputs. The final value of the targets in practice which are consistent can only be determined on the basis of iterative technique among various levels of planning hierarchy (see table 4.1).

What is the Best Approach to Designing Objectives for Industrial Plan in Developing Countries?

To facilitate a preparation of a realistic industrial plan in developing countries under the prevailing socio-economic

conditions, we suggest three types of objectives to be defined:

1. Deterministic objectives for the public and mixed (i.e., joint public and private ventures) sectors. These objectives are possible to realize because these sectors lend themself to the effective government control.
2. Oriented objectives for the national and foreign private sector. Oriented objectives are expected to be realized during the plan period. Threfore, they may be expressed either in form of qualitative indicators (i.e., verbal description of the nature and main trends of development of the given process within the planned period), or else in the form of parameters which may include the quantitative characteristic of that process which is expected to be realized during the plan period.
3. Estimated objectives for autonomous processes connected to the industrial activities. For example, exports of manufacturing goods or agricultural output required for industrial processing. Such magnitudes are dependent upon factors difficult to control. Therefore, estimation is the only possibility to quantify and link them to targets. It should be pointed out here, however, that the achievement of estimated objectives is connected

with a certain degree of uncertainty. For an estimate of what will happen is dependent either upon the existing circumstances (the ceteras paribas close) or on the changing in the magnitudes of the influencing factors.

The actual nature of each of these three groups of planned objectives from the specific characteristics that are peculiar to the given country. In cases in which possibilities for guiding socio-economic development are limited even within the public sector, the major objective of planning may initially be confined to ecconomic policy. In such cases the plan will largely refer to a diversity of organizational and economic measures aiming at a centralized regulation of public industrial sector and at some control over the development of the private sector. All remaining targets will then be of a forecasting nature.

In cases in which the state can exercise more control over the public sector and in which the public sector is relatively dominant the plan could comprise a larger set of deterministic objectives in addition to various oriented and estimated objectives.

It is worthwhile mentioning here that in the practice it is not advisable for developing countries to include a large number of objectives and targets in medium-term plan because they usually introduce regidities in the planning process and they may bring about confusion when deviation occur during plan implementation. Therefore, it would be easier to limit the number of targets to the essential ones.

Finally, the determination of industrial plan targets must be done in co-ordination with other sectoral plans to ensure an internal consistency of the national plan. In cases in which no national plan exists, it is of particular significance that the industrial planner takes account on the interlinkages between industry and agriculture. For example, the determination of targets connected with the industrial output destined for agriculture, such as agricultural and irrigation machineries, fertilizers and pesticides must be calculated on the basis of the expected needs and absorptive capacity of the agricultural sector during the plan period. This applies also to the determination of industrial output targets that are dependent upon agricultural outputs such as food processing, textiles and leather which must also be calculated on the basis of the expected agricultural output of the relevant goods.

Table No. 4.1

The Sets of Goals, Objectives and Targets	
Goals (Long-term)	1. Industrialization of the country. 2. Achievement of economic independency. 3. Improvement of standard of living. 4. More equitable distribution of income.
Objectives (medium and long-term. However, long-term objectives are subject to changes in future.)	1. Accelerate the rate of industrial growth. 2. Increase the basic industries. 3. Increasing productivity in the traditional sector and small-scale industries. 4. Increase the employment in the industry. 5. Increase industrial output of goods required by large masses of people.
Consistent Targets (for medium-term plan)	1. Achieve ...%growth in the industry. 2. Raise the share of industrial sector (manufacturing) in GDP to ....% 3. Increase employment in the industrial sector by at least ....% 4. Improve productivity in the traditional and small-scale industries by at least ....%

Exercise

It is unlikely that some universal recipe exists for selecting planned goals and objectives nor for describing an industrial plan as a system of goals objectives and targets of industrial development. Therefore, it is of great importance for the training purposes that each practitioner would set goals of objectives and targets for the industrial plan for his (or her) country. These goals and objectives should be identified, chosen and ordered in accordance with their priority on the basis of the specific characteristics peculiar to the country's economy, such as per capita income, factor endowments, stage of industrialization and population. Because the targets are usually defined in practice on the basis of iterative technique, they should be regarded for the purpose of this exercise as tentative.

Teachers are asked to assist practitioners to develop the main ideas and to evaluate the results. Moreover, we recommend that this exercise should be dealt with and evolved during lecturing Chapter III. This is necessary to enable practitioners to go into further details.

Information System for Industrial Planning

The process of developing industrial plans consists of a number of stages that are closely linked with each other. The first of these is the pre-planning stage which consists primarily of preparing the informational and statistical base.

Industrial plan preparation requires in the first place a comprehensive statistical basis to analyse past and current industrial activities to evaluate necessary indicators. Moreover, implementation of plans also depends on up-to-date indicators to help evaluate progress and introduction of readjustments.

Thus, statistical data about past and current activities contribute the necessary initial materials for designing the industrial plan. Moreover, the higher the quality and scope of available statistical information and the greater the extent to which it is expressed in operational terms, the more it contributes to the quality of the industrial plan, particularly in ensuring its internal consistency as well as the coherence among different objectives and real possibilities of industrial development.

The Status of Statistical Information in Developing Countries

Planning in the majority of developing countries is to some extent handicapped by lack of comprehensive informational and statitistical base. In many countries there is lack of reliable up-to-date information about national income, consumption, accumulation investment, capital formation and employment. It is more difficult to find relevant data on sectoral activities, such as industry, mining, agriculture and records on roads and road traffics.

Even in cases in which relevant data are available, their use might be quite useless. For example, data on national income include gaps, breaks in continuity and time lags. In many other cases the quality and scope of statistical information available are not sufficient to make long term projection with the minimum degree of confidence required. Many planning experts do not even trust the published statistical information in many developing countries. A number of factors may account for this. For example, the population figures are someitmes overestimated for prestige or political reasons. However, in general unrealiable data are attributed to the inexperience of statistical personnel.

Another problem connected with statistical information in developing countries is the need for co-ordination of statistical work in the country to bring about a free flow of information within the government. In many cases, we find a ministry or its department

hoarding data it ha collected as its private property. A number of motives may account for reluctance to make information available to other branches of the gcvernment. For example, to hold more power within the bureaucratic system if more information are available, or sometimes due to political reasons, or to cover economic failures.

Industrial Planning in Developing Countries and the Problem of Inadequate Data

> "Planning on the basis of inaccurate data may be worst than no planning at all, since such data may not only point to wrong solutions to problems but also create a false sense of complicacy and lead to serious bottlenecks and rigidities." 1/

The question facing the planner in developing countries, where no adequate data are available, is whether to start planning immediately or whether planning should be postponed until improved information in sufficient quantity is obtained?

1/ UN. ECAP. "Economic Development and Planning in Asia and the The Far East", Economic Bulletin for Asia and the Far East, November 1955, P.69

In fact there are considerable risks connected with planning on the basis of insufficient data. Experience has shown that ambitiuos plans which have been prepared without sufficient data have resulted in serious bottlencks which have prevented completion of plan. Therefore, if a country in which necessary data for the plan is not available and it is determined to embark upon serious development planning, then the planners must postpone planning and concentrate first on collecting and analysing minimal information and data required for plan formulation. This was the case in many African and Latin American countries in which planning experts started with pre-planning surveys needed before preparing the first plan. In this connection the country must launch an appropriate programme with the help of foreign experts and international organizations to carry out population sensus, survey the existing industries, traditional sector, basic soil, land used, mineral, water and other resource surveys. It is worthwhile mentioning here that geological survey is of extreme importance. Fot it is no point in establishing industries based on local raw materials if geological or other surveys have not been made to discover the extent availability of these resources. In many developing countries cement, paper and sugar plants and other industries have been placed on uneconomic cites because of absence of resource data. Moreover, relevant statistical surveys should be done on the basis of samples.

Moreover, it is of extreme significance that officials, engineers, economists on different administrative levels as well as workers should participate in the process of collecting necessary data and information for plan preparation. In fact sometimes experienced personnel can help to analyse the situation and overcome some rigidities connected with deficiencies of data.

Improving Planning Data

Planning is a perpetual process which can never be completely perfect, so are the informational and statistical data base required for the planning. Therefore, the established minimal information and data base for starting the planning process should further be developed to meet future planning needs. In this connection some organizational efforts should be required to facilitate a proper collection, flow, storage and retrieval of information:

1. Co-ordination of the flow of Statistical Information

In many developing countries there is a lack of co-ordination within the governmental apparatus to produce unified data. This is partly due to the existence of more than one planning body and partly due to the absence of central statistical office. But even in cases where central statistical office exists no real organization is to be found to co-ordinate statistical activities at different levels. Thus, frequently parallel government offices produce figures without checking with one another, and the figures released are often not comparable with each other.

The need for co-ordination is great not only to eliminate duplication and improve comparability, but also to bring about a free flow of information within the government. Therefore, developing countries urgently need the creation of central statistical office and other statistical units on different levels, such as ministries, departments, large-scale enterprises, as well as regional statistical offices and co-ordinate their work in a way to facilitate better access to data and flow of information. In the following some typical sources of data for industrial planning other than statistical offices which must be included in the statistical net work:

a) government administration at all levels;

b) foreign trade organizations;

c) plan executing agencies;

d) trade industry associations;

e) investment agencies;

f) special task forces, working groups and consultants involved in specific development studies;

g) organizations managing infrastructural facilities;

h) central bank and commercial banks;

i) labour organizations;

j) interantional organizations such as OECD and especially the UN system including UN Statistical Organization, UNIDO, FAO ILO, UNCTAD and World Bank.

2. Aggregation of Central Planning Body and Central Statistical Office

Experience shows that there are significant advantages if the central statistical office is made part of the Ministry of Planning in developing countries:

a) The heavy dependance of planning upon statistics requires close association between planners and statisticians and statistical services.

b) The preparation of data could be made in suitable form for planning. Whereas if central planning body and central statistical office are disaggregated, data might be arranged in unsuitable way for planning purposes.

c) Since planners are the main users of statistical data, they are likely to do much for the improvement of their quality and quantity.

d) Delay in the preparation of information can strongly impede planning process. Therefore, measures can be taken with the central planning body to overcome difficulties in preparation of necessary data or decide on priorities.

Finally, if the central statistical office has been placed in the central planning body, equal attention should be paid for the provision of data for purposes other than planning.

3. Upgrading the Efficiency of Statistical Work

The efficiency of statistical work depends on a number of factors, some of which are listed below:

a) To improve the stock of planning information the programme of information must be fitted to the particular needs of planning process to avoid any possible waste in the efforts of statisticians. In this respect the planners must take into account the scarcity of statisticians in the first stages of establishing the statistical information base and decide precisely upon the kind of data nad information they need in the future to permit statisticians to provide data in an organized way.

b) Developing countries must allocate sufficient funds for statistical work to enable carrying out necessary surveys, collection of data, adequate training for personnel and to enable paying attractive salaries to attract effecient people to statistical work, as well as introduction of computers and other modern equipment and facilities for processing, storage and retrieval of data.

c) Statistical work requieres continuity, and should be followed up by the central planning body and other governmental organs to ensure the following: First, the accumulation of reliable statistics in the long run. Second, adaptation of statistical work to more

advanced planning techniques. Third, expansion of the field of statistical activity to cover more aspects of economic and social activities.

Data Required for Industrial Planning

The specific requirements of the industrial plan from statistical data depend to a great extent on the nature of the plan, socio-economic conditions and the length of planning period. Nevertheless, it is possible to state a number of general requirements:

1. From the statistical point of view two types of data would be required to formulate and elaborate the plans; time series and cross section. 1/ Time series data are required for examination of past trends and predicting the future. Since the industrial plans in developing countries are to some extent of a forecasting nature, statistical offices on different levels may forward estimates to planning bodies as well as calculated indicators. For example, a description of the manufacturing activity on the basis of time series data is always useful and sometimes

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1/ Time series and cross section data are presented in Annex 4.1 (See Tables 4.2.1 and Table 4.1.2)

indispensable for effective industrial planning. A description in the form of estimates over time can also be made for different industrial sub-sectors to reveal relative importance, similarities and differences.

Cross-section data are required for determining the behaviour of different factors, for example consumer preferences and estimating demand for different consumer goods on the basis of family budget samples. This is of great importance for industrial planning in some developing countries where final demand is largely affected by market forces.

2. From the technical point of view, industrial planning requires a great number of data in form of "technical norms". "Technical norms" are indispensable for working out balances and establishing input - output tables, as well as application of different mathematical methods for preparation of different stages of the industrial plan. 1/ Industrial planning requires different norms for intermediate consumption of key products, such as steel, chemicals and petrochemicals, refined products,

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1/ For definition of "technical norms" see the section on balances.

cement, etc. In addition industrial planning requires other kinds of norms, for example average requirements of human being from calories and protein to set long term targets to meet modernization requirements of agriculture from industry.

3. From the organizational point of view statistical data must be fully adjusted to the requirements of plan preparation and implementation. Therefore, it is necessary to provide the data in developing countries in such a way that it follows the targets of the plan. According to the experience of most industrial planning experts in developing countries it would be most suitable to disaggregate the industrial sectoral plan into sub-sectors or branches in accordance with the ISIC 4-digit classification, and that for the same branches industrial statistics collects the data. Some countries may go into more detailed breakdown in accordance with the details of their industrial plan. For example, to adopt a 5 or 6 digit. The minimum should be 4 digit because 3 digit classification is mixing to many branches under one code number. This could be well seen from the following comparision:

3 digit	4 digit
311/312 food manufacturing	3111 Slaughtering, preparing and preserving of meat;
	3112 Manufacturing of dairy products;
	3113 Canning and preserving of fruits and vegetables;
	3114 Canning, preserving and processing of fish, etc.

Consequently, 3-digit classification does not give sufficiently detailed inside view and, therefore, does not enable a proper analysis of problems involved.

It is worthwhile mentioning here that ISIC classification is scientifically classified and may satisfy any country's requirements. Moreover, it facilitate international comparison which are of great significance for planning purposes.

Data Required for Industrial Plan Preparation and Elaboration

a) Time-series on the national economy, such as GDP, national income, consumption, investment and capital formation.

b) Every plan requires data about human resources. This is of great significant due to the facts that people must be the primary beneficiary of any plan, as well as the source for both manpower and market demand. In this connection a realistic industrial planning requires two kinds of data. First, information about the nature and growth of population the size, consumption and sectoral employment of the labour force, nature of available skills, rural and urban unemployment. Second, information about family expenditures at different income levels and circumstances. For example, rural and urban in order to estimate potential demand. This is very important under the circumstances where the interference of the government is very limited.

c) Detailed data on each industrial sub-sectors, such as capacity and output, exports of manufactured goods, capital formation and depreciation, breakdown of intermediate consumption, such as energy, semi-finished materials and other intermediates from local or imported sources, employment and skills (nationals and foreigners). In addition other information about constraints and bottlenecks and new opportunities for further expansion is also required.

d) Detailed data on the traditional sector are also needed. Here data on output, employment and input requirements are of great significance. In addition information on problems faced by the producers and possibilities for both development of productivity and co-operation with the modern sector are also of importance.

It is worthwhile mentioning here that in cases in which information and data required for both the industrial and traditional sectors are sufficient or reliable, it would be of extreme importance to launch an industrial survey to collect as much as possible of relevant data and information.

e) Data and information about natural resources required for industry, such as the location of the mineral deposits, size and quality of the depostis, as well as agricultural inputs required for industrial processing.

f) Data and information about other relevant sectors and projects, for example the locations and capacities of hydro-electric stations, water network, availability of water for industrial purposes, reciprocal requirements of agriculture, construction and industry.

g) Data on exports and imports (quantities and prices) of manufactured consumer and capital goods. This is necessary to evaluate the structure of foreign trade, the investment ratio, consumption patterns, as well as to estimate marketing possibilities for projects involving the expansion of production for export or for substitution of imports. In addition, information about world market condition and their outlook, as well as costs of production abroad is also needed.

h) Fiscal data including estimates of revenues and proceeds of foreign and domestic loans and grants, help to determine the public expenditures for investment and current expenditures associated with plan. And information about funds available to finance private investment is also necessary to set targets for the private sector.

i) Data about each planned industrial project are required in order to enable the planner to estimate the costs, in national currency and foreign exchange, and physical requirements for construction materials, machinery, equipment,, supplies, manpower and skills.

Data Required for Plan Implementation

The nature of statistical information that is required for control of plan implementation is determined by the plan's objectives and targets. However, whatever the differences between the objectives and targets of different plans might be, every plan requires for control of the implementation process two kinds of statistical information. The first, are information concerning the follow-up of the execution of industrial projects. The second are information about the development of the existing industries during the plan period.

In Chapter I we have discussed the problem of industrial plan implementation in developing countries, where it was shown that plan implementation constitutes the major bottleneck in industrial planning process in these countries. However, in order to facilitate a proper control over implementation of industrial plans in these countries, it is necessary to set up a reporting system for all important industrial projects to follow-up progress being made in the execution. In this respect provision of relevant data and information can play a significant role to avoid possible dealys in execution.

Moreover, data required for plan implementation must permit identification of potential bottlenecks as early as possible to

facilitate the determination of their causes, evaluation of the extent to which deviations threaten the attainment of plan targets and taking effective measures for plan readjustment. Therefore, it is of great significance for the proper functioning of the follow-up activity that data be provided without any delays.

The implementation of industrial plans in developing countries is usually decentralized in many operating organizations within the ministry or ministries of industry; wheras evaluation of a plan's progress centralized by the central planning body. However, evaluation of industrial plan's progress depends on complete, accurate and timely reports on the progress of the execution of the industrial projects. These, however are almost never available for all industrial projects and industrial sub-sectoral programmes in the majority of developing countries.

Experience of many developed countries as well as few developing countries shows the necessity of introduction of reporting system to enable comparison of performance with planned schedule. Setting up a reporting system requires the following:

1. Creating central follow-up unit within the central planning body and in important districts.
2. Creating statistical units within operating units to report on the progress of execution.

3. The reports must be at least monthly, standardized, simple, short and expressed in physical and monetary units.
4. The central follow-up unit must publish a monthly report on the basis of received reports indicating the potential bottlenecks, their causes and suggestion, as well as measures for plan readjustment. To facilitate more comprehension, these reports must include maps and charts.
5. The central follow-up unit must also prepare a comprehensive implementation report covering the period of medium-plan in which a detailed description on the past trends, problems and constraints that occured during this period.
6. Follow-up reports must be made public to mobilize the people's support and participation in implementing projects.

Follow-up activity requires data concerning the development of the existing industries during the plan period. These data are necessary to identify major trends of industrial development in both private and public industrial sectors in the course of plan implementation, as well as the extent to which they meet the general objectives and principles of the state economic policy that underly the plan. Here again the statistical information must be provided without delays to permit the planner to monitor deviations and to take measures or to change some policies. For example, to raise tax duties on similar imported commodities, or to reduce subsidies for certain group of commodities or to reveal bottleneck in supply of strategic intermediates.

The Necessity of Price Indices for Planning

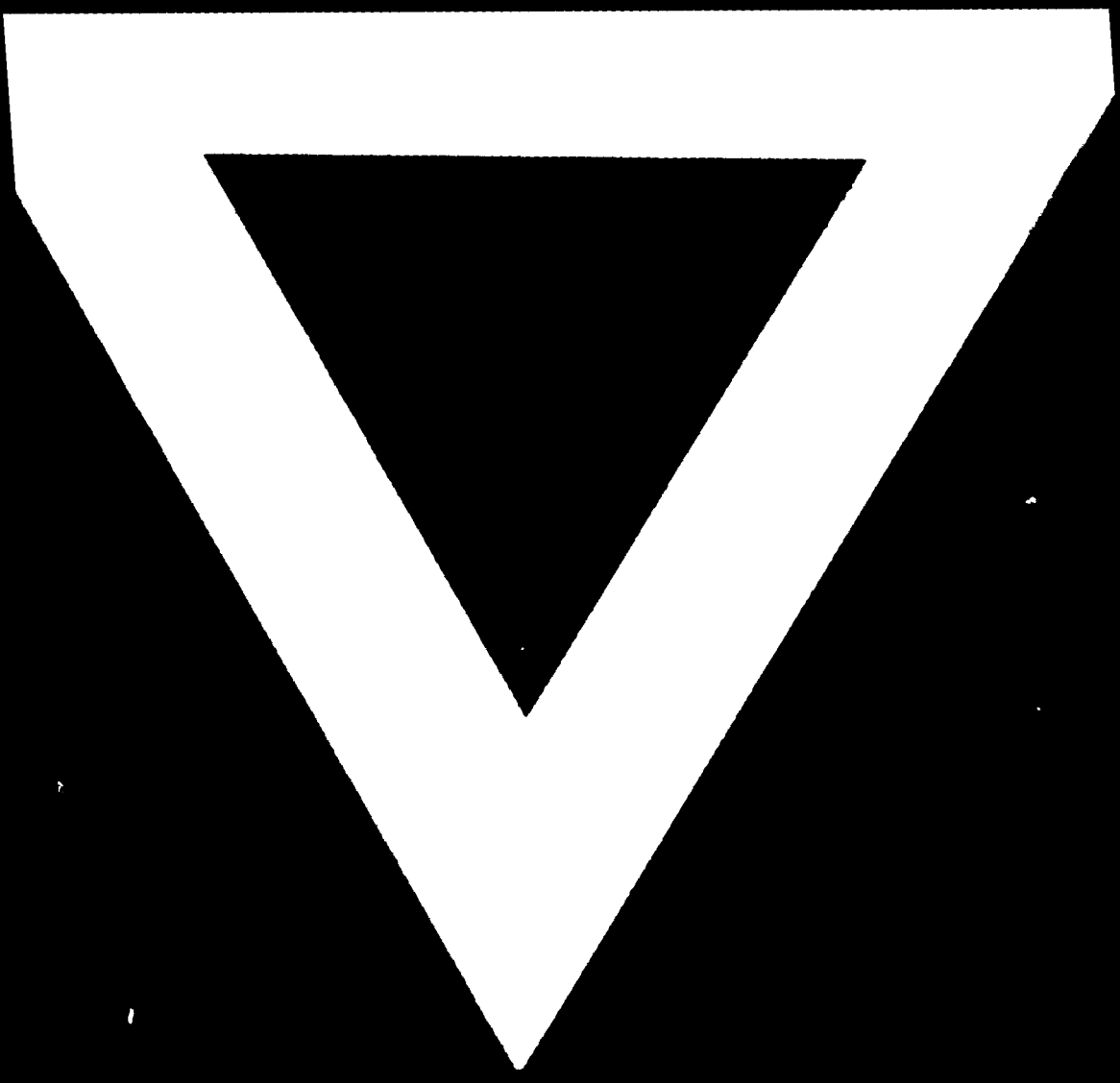
Statistical data serving industrial planning must make it possible to identify major industrial development and relevant socio-economic trends, during the preceding period and also provide an initial basis for meeting the plan's requirements for internal consistency.

Inflation within the national economy and in world market prices makes calculation based on current prices quite useless. In addition changes in the prices of individual groups of commodities and services are often of an irregular nature and result in substantial discrepancies between magnitudes of planned indicators expressed in value terms and the actual magnitudes of corresponding values. Therefore, the use of constant prices in plan preparation is of great importance for establishment of internal consistency. For the changes of prices in different rates turn the consitent plan out to be unbalanced.

In this connection the preparation of price indices is of great significance to deflate time series which are expressed in current prices. Deflation of these time series by their relevant price indices makes it possible to both identify the actual indicators and makes necessary readjustments in the course of plan

execution in order to avoid disproportion in the development of national economy.

The impact of data expressed in current prices can be immense, particularly within the execution of planned industrial projects. This is due to the fact that in most developing countries the development plans are to a great extent investment programmes. Measuring plan progress on the basis of expenditure might lead to unrealistic results because of inflation. For increasing expenditures due to price increases often results in a situation in which capital investment plans appear to be fulfilled or even over fulfilled if expressed in current prices, while the actual projects which they refer continue to be largely uncompleted. This must also be taken into account in setting up the reporting system.



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