UNITED ARAB REPUBLIC

THE INSTITUTE OF NATIONAL PLANNING

Memo. No. 638

GENERAL ORGANIZATION OF PLANNING IN INDUSTRY (Second Edition)

Part I Long-term planning

by Prof. Dr. K. Sack Prof. Dr. Hermann Linsel

April 1966

GENERAL ORGANIZATION OF PLANNING IN INDUSTRY

Part I

Long-term Planning

(2nd newly elaborated edition)

Contents

- 0. Introduction
- 1. The necessity of long-term planning
- 2. General contents of long-term planning
 - 2.1 Prognostic estimations of development
 - 2.2 Prospective planning
 - 2.2.1 Main features and tasks
 - 2.2.2 Indicators of prospective plans
 - 2.2.3 Main fields of prospective planning

O. Introduction

It can be stated that the necessity of planning is widely recognized in almost all developing countries. There are, however, decisive dissents as to the contents and role of planning in national economy and its various branches. In line with our subject, we would like to concentrate upon those problems merely relative to industry and its productive units. In spite of this, sometimes it will inevitably be necessary to touch problems of entire national economic development, too.

When studying the history of industrial development, one will find that thorough consideration has been paid to it in all emerging countries. That is, though they are generally earmarked by a predominating sector of agriculture determining the economy of the country, one is well aware of the fact that only industry will be able to push ahead national economy as a whole. This is stressed, for instance, already in the First-Year Plan of the United Arab Republic when saying:¹

> Whilst agriculture is considered the primary sector upon which the whole structure of the economy is based, industry is the basic outlet for economi progress and continual growth ...

Consequently a growing economy is usually characterized by an expanding industrial activity and a continuous progress in the means of production based always on scientific methods. Industry, in actual facts opens three new prospects: the increase in production, the variety and improvements of products and the continuous scientific progress.

Similar considerations are given in the Third 5-Year Plan of India. There, it is pointed out:²⁾

¹⁾ General frame of the 5-Year Plan for economic and social development, Cairo 1960, page 4.

²⁾ Third Five Year Plan, published by the Planning Commission, Government of India, June 1960, page 24

The second set of general considerations concerns the priority accorded in the plan to the related sectors of industry, power and transport. Development in these fields is vital for lifting the economy to a higher level and for its accelerated growth. It is recognized that beyond a stage, the growth of agriculture and the development of human resources alike hinge upon the advance made in industry.

Owing to the role inductry is given, its planning starts already at the very early stages of economic activities in newly independent developing countries.

But, what does this kind of planning imply?

At that time, planning of industry is chiefly confined to determining certain projects, the realization of which is considered to be urgently needed for different reasons. More or less empirically, those projects were singled out industrialization of the country in question should be started with. Such a method of embarking on industrial development can be found everywhere.

In the UAR, for instance, immediately after the revolution "The Permanent Council for the Development of National Production" was appointed. Its activity in the field of industry was concentrated upon studies of already started projects of industrialization and their continuation. Besides that, researches were undertaken to determine those branches and projects considered to be cornerstones in the UAR's economic development.

Again, similar efforts can be observed in India, for example, after having established the Indian Planning Commission in 1951. In result of general studies of India's economy and by considering the ownership relations, planning of industry in the First 5 Year Plan has been estimated as follows:¹⁾

1) D.R. Gadgil, Planning and economic policy in India, Asia Publishing House, 3rd edition, 1965 page 9. The programme of suggested expansion in this sector is said to be based on previous discussions with private industrialists. Presumably it reflects the judgements or expectations of leaders of industry in that sector. It is, therefore, not a programme drawn up by the Planning Commission in relation to certain overall objectives and trends determined by the Commission but only a summary of what the private industrialists think may well happen during the next five years.

All this leads to the question whether respective activities undertaken at that time can be looked upon as a real planning at all. And the answer is also given by highly esteemed economists of both the countries cited as examples. Generally, these endeavours are called "attemts of planning" or "a modest approach to planning" (Nehru)¹⁾ aimed at gaining experiences in this rather complicated field of economic development. D.R. GADGIL is, the sfore, quite right when saying:²⁾

-3-

In the main, it is no more than a compilation of existing and expected plans of public investments, chiefly in irrigation and transport, by central and state governments put together on the basis of no clear criteria; in the field of industry the "plan" presents just a resumé of discussions with private industrialists, in other spheres it mostly indicates existing expenditure, objectives and levels on the part of state and central governments.

This stage of organizing economic development must, therefore, be considered a transition period only. To be really successful, it has to be completed by a system of comprehensive planning of national economy and its single sectors and branches. In this case, determination of industrial development is expected to be derived from a general approach of economic growth of the country concerned by pointing out those branches of industry given priority in a certain stage of development. And as experiences show, this way of formulating various kinds of objectives must step by step be followed by all the developing countries if lasting economic effects are to be achieved. Dr. I.H. ABDEL-RAHMAN, an Egyptian economist, describes these problems as follows:3) 1) C.f. also I.H. Abdel-Rahman, Comprehensive economic planning in the UAR, Memo. No. 238 of the INP, Cairo 2) D.R. Gadgil, ibidem, page 20. 3) C.f. I.H. Abdel-Rahman, ibidem, page 16.

In comprehensive planning, when fully developed, an initial stage of macro-planning is accomplished before consider-ing single projects or single policies. Macro-economic studies serve to give a rough determination and the general proportions of the final plan, in the sense that it affords a general frame of reference for fitting projects and policies within. This will insure that final co-ordination between detailed projects or specific policies will be possible. Otherwise it will not be possible to have a well-knit plan; one could only get a collection of activities, some of which may be diametrically opposed in the other.

After having taken for granted that comprehensive planning is agreed upon to be the only method for leading industrial development, we have now to shift to the problem which space of time such plans should comprise.

In the early stages of planning in developing countries as well as, for instance, in the European socialist countries, one will find that short-term programs related to certain projects or branches were mainly applied so as to initiate planning. This is due to the fact that planning had to be started with at all and it was easier to come to grips with, at first, rather limited problems. Thus, you will find in the German Democratic Republic, for instance, a Half-Year Plan, elaborated in 1948, a Two Years Plan valid for the period from 1949 to 1950 and, afterwards, the First 5-Year Plan was put into operation. Trends of the same kind can be observed in the other European socialist countries, too.

In the UAR, the first program of industrialization was drafted in 1957 and it was followed by some other short-term projects of industrial development. It has been estimated, however, that;¹⁾

1) c.f. I.H. Abdel-Rahman, ibidem, page 2.

The partial and sectoral plans. failed in most cases to interest the public as a whole, they did not create a national commitment towards their fulfilment, and hence, were usually neither effective nor successful in reaching their objectives. Many development programmes were cut short, stopped or replaced by others before they were completed.

Hence, efforts are being made everywhere in planned economies to draw up comprehensive plans for over a longer period. The reasons are the necessary space of time needed so as to implement general changings in national economy, on the one hand, or to prepare and introduce new industrial projects, on the other. There is no general rule which space of time is to be used as basis of reference. Yet, on principle, it is agreed upon that it must be longer than only 5 or 10 years. Again, Dr. I. H. ABDEL-RAHMAN is to be quoted:¹⁾

> It is generally felt that a 10-year period is too short to draw up a proper perspective plan and to embody in it the principle structural changes in the economic and social attributes of the society, as well as, the effects of the capital technological developments expected in the future....

Long-term perspective planning (20-25 years) should be established to derive the main guiding lines of social development.

In India, economists are discussing similar questions and it becomes steadily more recognized that planning must be considered a merely long-dated formulation of targets and activities. This is stated, e.g. by K.N. BHATTACHARYYA, professor for economics at the National Academy of Administration, India. In his book "Indian Plans", he writes:²⁾

> Planning for making advance towards self-generating economy is essentially a part of the techniques of bigger plans for long range development. In other words, planning is always with a perspective. For the sake of convenience, a plan period may be for

1) C.f. I.H. Abdel-Rahman, ibidem, page 12,13.

2) K.N. Bhattacharyya, Indian Plans, Asia Publishing House, London 1963, page 159. five years, but each plan has to be designed in a way as to prepare the ground for fresh advance in the next plan period which again is to be linked with the future. Planning is thus not simply achieving mere immediate targets, each plan is part of a bigger design for achieving progress visualised over a longer period of time. The current third plan is a part of the five year plans to achieve certain targets during the period 1951-1977. Planning for 20 to 25 years is the essence of perspective planning and the design of each plan in the shorter period has to be linked with that broader objective over the longer period.

Opinions of leading economists in developing countries concerning contents, and duration of plans, mentioned so far, coincide with the ideas of economists in the European socialist countries proposing elaboration of comprehensive plans for different periods of time, based, however, on prognostic analyses of necessary economic development for a period of approximately 25 years.

Since, furthermore, these countries' planning is already highly developed notably in the field of industry, it is worth while studying their methods and problems when solving the tasks of developing countries now under discussion. And this goes for methods of long-term planning and short-term planning and the contents of over-all plans of national economy and industry as well. Though there are remarkable differences as concers level of production, ownership relations, skillness and social standard of workers, etc., respective studies will be of use. This so, because the steadily increasing division of labour demands, for being successful, scientifically founded methods based on objective trends of socio-economic development which are generally valid for the European socialist countries and emerging countries adopting the system of planned national economic development.

1. The necessity of long-term planning

The necessity of comprehensive and thorough analyses of preceding and, above all, future activities is due to different reasons. The most important of which are formed, nowadays, by the problems of a complex national economic development decisively be influenced by the conversion of science in a direct productive force and their effects on social production. By this process, the entire nature of industrial production and the role of worker in it is or is going to be changed. ZWORKIN, a Russian scientist, characterizes mentioned transition as fol-lows:¹

-7-

While the first period of the application of science was linked with the designing of working machines which mechanically shaped the materials supplied by nature, today an increasingly important role is played by implements of labour which constitute not a system of working machines such we have been acquainted with hitherto but a sort of vascular system in which natural processes converted to industrial purposes take place. Artificial processes, unknown in nature throughout the billions of years of its existence are now acquiring ever-growing importance.

In addition to this, for long-term planning, it is of peculiar interest to study and to know the role of workers and its changings caused by these decisive alterations of production so as to draw the right conclusions. It can be stated, for instance, that under lastly mentioned conditions workers do not any longer play a dominating role in immediately directing and controlling production process. The consequences of such alteration are described by ZWORKIN as follows²:

1)	C.f.	A.	Zworkin,	Science as a direct productive force, in:	
				Impact of science on society, Vol. III (1963)	1
				No. 1, page 56, UNESCO.	
21	0 0				

2) C.f. A. Zworkin, ibidem, page 57.

Production efficiency will not be determined by the expenditure of living labour but by the general level of science and the degree of its technological application. Man's role in production will become still more important not because he will take a direct part in production but because he will take part in the development of science.

To implement mentioned tasks of converting science requires a steady and enormous expansion in both the development of basic and applied research and an increase of the number of scientific personal to be engaged in. And this process takes actually place and it has been estimated that, for instance, 90% of all the scientists ever living on earth are working at present.

Moreover, an all-out shake-up of scientific activity is now in full swing¹⁾:

Scientific institutions are being transformed into large enterprises and, what is extremely characteristic, science itself is actually demanding the establishment of such enterprises and huge outlay of material resources.

The latter have been raised tremendously. This shall be illustrated by some figures.²⁾ When the English physicist FARADAY discovered the basic laws of electricity in 1850, the value of the equipment used was about \pounds E 9. The equipment used by the German physicist HERTZ who discovered the fundamentals of wireless in 1888 cost about \pounds E 90. The value of laboratory equipment in 1930 amounted on an average to \pounds E 3 000 000. The equipment of a laboratory for physics today demands an outlay from \pounds E 5 to 10 million.

In result of this spectacular progress of science and technique, there have happened decisive alterations in the whole

- 1) C.f. A. Zworkin, ibidem, page 52
- 2) On basis of research undertaken by Prof. Dr. H. Bernicke, University of Economics, Berlin.

industrial production. Most outstanding factors are given by the mechanization and automation of production processes and the expansion and quick changings in production programs. As to the latter, it can be noticed that the time needed from the original idea up to its full utilization in production has been shortened more and more. Let us consider the development of the telephone. It took approximately 50 years to be fully used in production. The development of television took more than 10 years and that of transistors only 5 years. Other examples are given by the following sketch.

-- 9---

(Sketch 1)

In connection with this development, another phenomena comes into the fore, the steadily progressing process of specialization and social division of labour, on the one hand, and of technical and economic collaboration, on the other. That is, while the introduction of science in production is closely linked up with specializing of production processes and, thereby, production programs of factories, the need of connecting the various and specialized links within national economy is growing simultaneously, toc. This entire process of establishing a highly effective social division of labour, specialization and collaboration according to future needs and the adequate equipment of factories and their whole technical lay-out cannot be organized from one day to another but must thoroughly be prepared and introduced very longdatedly.

And that stresses again the necessity of long-term planning of industry in order to put into operations such a system of social division of labour which fits in with the basic trends of science and technique and the requirements of socio-economic development of one's own country, or in case of multi-national economic units of socialist countries, the requirements of their economic development as a whole.



Sketch 1: Shortening of space of time needed to introduce new inventions into production

-10-

2. General contents of long-term planning

The idea of long-term planning is by no means new. Attempts have been made in various countries and related to different subjects. While, however, in countries following a "freemarket-system" these endeavours were and are merely directed at solving a limited task according to the intentions of the undertaker in question, long-term planning of industry in socialist countries was and is always connected with realising national economic objectives. That is to say, specific long-term aims of industry are derived from the targets of general socio-economic development so as to attain, for instance, a break through in economic growth. One of the first and most famous examples in this respect is represented by the known plan of the electrification of the Soviet Union.

Nowadays, similar projects and plans can be seen in all the European socialist countries as well as in many developing countries. And again, one of the outstanding long-term programs of industrial development of today is strongly connected with electrification, the building up of the High Dam in the UAR. This example very obviously shows, on the other hand, the close interactions between industrial and national economic development as a whole.

Though the construction of the High Dam itself must be considered an industrial project, its implementation and accomplishment affects quite a lot of other sectors of national economy, too.

What does this mean?

Building up of the High Dam requires common activities of different branches of industry as building materials and building industry, engineering, electrical engineering and so on. In line with accomplishing single stages of that project, new industrial and social projects can be started with as, e.g. establishment of a new factory for processing iron are in Aswan, or existing factories can be provided with necessary quantities of electricity so as to run them to capacity. As regards social projects, we have in mind electrification of villages and of activities in agriculture as driving of water pumps, etc.

Besides this, decisive alterations will occur as concerns the entire irrigation system of the UAR, which, in turn, will influence quantity and quality of agricultural goods e.g., cotton, being the basis for various branches of industrial production.

Thus, long-term planning of industry must be looked upon a very complicated process successfully to be implemented only by studying the manifold interactions and repercussions of the project under discussion.

Furthermore, it becomes evident that implementation of such projects as the High Dam or other programs of industrializing the country or of introducing new branches of industry has to be based on thorough estimations for different periods of time.

And that, firstly, for a very long-term development comprising accomplishment of the project as a whole. Starting from that general plan, main groups of tasks are qualitatively and temporally to be determined by considering the necessary point of time they have to be wound up and the period for their implementation. That is, partial tasks are fixed in calculating back, i.e. proceeding from the date of finishing the aggregate project up to the date of starting single preparations. Since, secondly, scientific and economic development cannot be expected to take their course in a linear way, due attention must be paid to alter-ations in theory and practice. This is supposed to be achieved by subdividing that long-ranging space of time of accomplishing the whole project into some prospective programs. They are serving, in turn, as basis in order to draw up medium-term and short-term plans needs for immediately organizing activities of materializing the project in question.

Thus, the main stages of planning are, above all:

- a prognostic estimation of the foreseen development within the forthcoming 15 to 25 years,
- prospective planning covering a period from 5 to 7 years,
- medium-term and short-term planning (annual planning, especially)

Because of the importance of these main groups, we want to explain their interactions and peculiarities somewhat more detailed.

By means of prognostic estimations, the main trends of science, technique, economy and living standard as well as structure and power of the country concerned are to be analysed and to be fixed respectively. Because of the very contents of these tasks, it will be the main subject of national economic planning though the single sectors and branches have to share in it. Various branches of industry are expected to study general trends of science and technique and to submit their prognostic estimations of foreseen technico-economic development to central planning authorities in order to adjust and incorporate them into the overall plans. These basic programs of the single branches are usually laid down in so-called "scientific-technical conceptions" being later on a main guide for drafting the specific tasks within prospective, medium-term and short-term plans. While prognostic estimations are intended to give a survey on necessary tasks to be solved during a rather long space of time, prospective plans must be drawn up in a more detailed manner. That means, objectives of industrial prospective plans must deliberately be fixed and balanced within the branch in question, i.e., between their economic units as organizations of public enterprises, public enterprises and, partly, semi-state or private enterprises, and other branches and sectors of national economy as well.

There is, however, no need of having prospective plans detailed up to the single partial task and up to quarters and months of the year, but they should be drafted in such a way that, afterwards, necessary medium-term and short-term plans for implementing the tasks can very exactly be derived. To say it in other words, within prospective plans the main stages and connecting links must be pointed out the implementation of which forms crucial points of implementing the entire project under discussion.

From this it appears, simultaneously, that medium-term and short-term planning, as setting up of two-years, annual or monthly plans, cannot be set the task to answer such important questions of planning as trends of science and technique, structure of industry, assortment of production - in case of producer goods -, basic investments, etc. It is rather aimed at specifying qualitatively, quantitatively and temporally those targets being contained in prospective plans. When doing so, various kinds of aims have to be subdivided into partial tasks and their realization be prepared and balanced in a very profound manner. Generally speaking, one can say that balancing represents the principal item of medium-term and short-term planning. Yet, at the same time, it can happen that this kind of planning leads to new tasks of long-term planning, too, because of arising disproportions brought to light in the course of balancing tasks and capacities needed for their materialization.

So, the circle of planning is closed and it could be seen once again the necessity of a comprehensive and continuous system of planning at all levels of national economy covering different spaces of time in order to achieve the most effective results.

2.1 Prognostic estimations of development

From what has been said it becomes evident that prognostic estimations of technical and socio-economic development must be regarded a main activity of central planning authorities. However, for successfully investigating and implementing main trends of science and technique in socio-economic development, respective studies must be undertaken at other level of nationaeconomy, too, notably for industrial branches and their organizations. The contents of these prognostic estimations is characterized, of course, by the special tasks to be solved by them. In spite of this, their close connections must always be considered. For example, elaboration of main trends of science and technique forms one of the co-rnerstones of national economic prognostic estimations. This cannot be sufficient, however, for preparing further production within industrial branches. For that, it is rather necessary to know

> - the effects of these basic trends of science and technique on the features of main groups of production of the branch concerned,

- the effects of newly investigated result of science and technique on the development of demand at all.

That means, due to new results of basic or applied research it can happen, a certain requirement will much more effective be met by a completely new product than by those applied at present. But this must be known beforehand so as to avoid production of the obsolete goods continues at a point of time, the new production has already been started with leading to a big excess of old goods which cannot any longer be sold. Of course, in a planned economy there are all the objective conditions given to overcome such deficiencies and to co-o-ordinate efforts and activities of factories or branches influenced by these alterations. Yet, the likely problems must be knwon and, if such a development may occur, be kept in mind so as to ensure their solution in a conscious and planned manner. And that goes especially for such a stage of national economic planning earmarked by a high degree of responsibility of the main economic units, i.e. of organizations of industrial enterprises and enterprises themselves.

So, we are coming to the conclusion that prognostic estimations at the level of industrial branches are to be based upon the effects of science and techniques on their main groups of production by including likely possible alterations of the features of products at all and the consequences resulting from that.

Up till now, only the qualitative contents of prognostic estimations has been dealt with. For determining objectives of industrial branches, however, qualitative, quantitative and temporal development of demand has to be investigated in a very profound manner, too. Again, the main groups of production of the branch in question are considered to be the basis of reference. This so, because a certain demand can be covered by various products within the groups alternately and, furthermore, to determine the demand for each product separately would be either impossible or extremely expensive.

To start with the space of time, investigations of demand are to be undertaken, two important factors seem to contradict each other. On the one hand, for achieving a high quality of necessary technical and organizational preparations, respective space of time should be expanded as much as possible. On the other hand, the problem is well-known that the more expanding this

-16-

period the less exact will be the results. Thus, we will be forced to look for an optimum solution combining both the extremes in the most appropriate way. Needless to say that this " optimum is quite different with regard to consumer and producer goods and, within these groups, related to more durable or easily perishable products.

The quantitative demand itself is generally to be investigated by means of

- empirical methods,
- mathematical and statistical methods,
- combinations of both of them.

Empirical methods of determining demand are derived from the consumption, for instance, of the goods in question in the past by estimating what could likely be the consumption, at first, within the country, when retaining the general conditions valid at present.

In addition to this, possible alterations of these conditions and their effects on demand caused by, e.g.,

- changings of the price of the products concerned,
- changings in the number and structure of population,
- changings in the income of population,
- other products appearing on the market and being more attractive than those offered hitherto and analysed in here

have to be taken into account. Only in this way, analysis of retail-trade turnover of certain products for over a long periods - as shown in the following sketch - will lead to well-founded inferences concerning the possible future demand.

(Sketch 2)



•

Source: Statistisches Jahrbuch der DDK, Berlin 1964, page 352

Furthermore, changings of demand have to be estimated caused by possible imports or exports of the products under discussion. Since these factors are usually planned longdatedly, more exact figures can be made available as compared to those concerning a possible "buying interest" of the people within the country. Figures of import and export intentions are, finally, favoured by the existence of economic organizations for countries, marked by similar social conditions of production, like the CMEA in case of the European socialist countries¹.

Mathematical and statistical methods for prognosticly investigating demand are to be used as auxiliary instruments only. And that because there are no possibilities to include all the manifold similarly directed and diametrically opposed trends of the development of demand into one formula. Moreover, any mathematical construction is closely linked up with certain assumptions being valid in the past which will usually differ to a more or less great extent from that conditions of the forthcoming period. Hence it follows, when relying on such mathematical models of the likely development of demand, a high degree of exactness is simulated which does not correspond to the intricate process of practical development of demand. After that, the best results are going to be achieved by an appropriate combination of pragmatic and empirical with mathematical and statistical methods. To say it in other words. On the basis of solid economic analyses of the forthcoming period, mathematical methods are to be applied on conditions that it has been proved beforehand the economic trends are similar to certain mathematical functions. Additionally, reality of these calculations has steadily to be controlled in practice in order to watch whether

1) The problems of investigating demand and markets are analysed, furthermore, in Memo. No. 597, part II, of the INP, Cairo.

..-19-

new factors are coming into being which may replace some conditions or assumptions and may lead to completely new consequences.

Determination of basic development trends of production and demand forms, however, one part of prognostic estimations only. The other side concerns the long-term formulation of those tasks which must be tackled and solved in order to implement these foreseen development. The problems connected with and the way of their solution shall be demonstrated by means of two groups of tasks, namely

- prognostic estimation of forthcoming research activities,
- prognostic estimation of necessary development of man-

representing crucial points in entire long-term planning.

Every research is finally aimed at improving efficiency of national economy. Spent outlays must, therefore, be repaid by selling products or performances based on results of these researches. Thus, those topics of research have to be singled out serving in the long run fulfilling of these goals. As regards the qualitative contents of research, respective topics are to be derived, as indicated, from the basic trends of science and technique taking into consideration the existing and planned division of labour in this field between factories, industrial branches and collaborating countries.

On the other hand, outlays to be spent for this research have quantitatively to be fixed in line with the importance results of research are going to play in industrial production. Hence, it must be calculated beforehand whether likely necessary expenses for undertaking research will possibly be repaid by the production started later on. Yet, such calculations cannot only be based on the immediately following but also, in case of basic industries especially, on the effects of that production being possible, for example, when using newlydeveloped raw-materials like plastics etc. From this is appears, mentioned estimations must be carried out in a very comprehensive manner by proceeding from and finishing with the effects on growth of national income.

After having executed this stage of preliminary investigations and coordinated their results with other branches of industry, arising tasks and available resources and capacities within the branches are to be compared with each other. Of course, for such a long-ranging space of time decisions can be concentrated upon main topics and available figures will be very rough ones only. All these difficulties notwithstanding, it has to be analysed in advance whether

- the order of magnitude of future research tasks is in line with existing or expected research capacities,
- the structure and qualification of scientific technical personnel in research institutions attached to the branch coincides with pecularities of forthcoming research activities,
- research activities will solely be undertaken by institutions of the branch concerned or whether other branches or institutions of national economy - universities, academies, etc. - should be involved, and so on.

Out of this whole complex, the role of manpower must again be put into the centre. This so, because implementation of all the planned researches depends lastly upon the faculties and knowledge of scientific-technical personnel and both of them cannot be gained from one day to another. In addition to this, scientific personnel is trained within but, to a large extent, also outside of the sphere of responsibility of industrial branches. This emphasizes once again the necessity of collaboration of different sector of national economy, in the case in point between industrial branches and institutions of higher education, if scientific-technical personnel of tomorrow shall be trained in consistency with future requirements of industry.

And this goes for developing countries especially where the number of undergraduates and scholarships for training abroad are not yet always planned or granted in line with these forthcoming needs. This is particularly stressed by the ILO - REPORT when saying¹)

> The first necessary step to redress this serious defect in planning would be to assess systematically the specific manpower requirements at various levels of skill for the fulfilment of each individual project as well as the whole of the development plan, to assess the value and capacity of existing training facilities and then to estimate, on the basis of such an assessment, the approximate amount of investment in training and education needed to meet this manpower budget. Manpower budgeting of this sort appears to be particularly needed for technical personnel at higher skill levels, not only because their training is more costly but because the long duration of training involved makes it necessary to plan for their training well in advance.

Thus, structure and level of higher education must be corresponding to the planned national economic development and prominence is to be given in all the developing countries, to the training in natural and technical sciences and economics as compared to arts playing hitherto often a leading role in their system of higher education. This goes for quite a lot of developing countries in Africa and Asia and was especially underlined in the ILO-REPORTS on Ghana and the Phillipines. As to the latter, it was stated as follows:²⁾

> The difficulty of providing suitable employment to all educated people is aggravated by the fact that relatively few Fillipines receive vocational or technical training. Law and humanities still account for a large proportions of the university degrees.

Employment objectives in economic development, Geneva 1961,
International: Labour Office, studies and reports No. 62, page 114.

²⁾ Ibidem, page 193.

So, the phenomena of unemployed intellectuals arises because there are "too many graduates of the arts and literature faculties" and "demand for lawyers, for example, is certainly not as great as the demand for technically trained personnel"¹) the lack of which are all developing countries suffering from.

To accomplish this, every country is in need not only of highly skilled manpower but also of various other degrees of qualification. Prof. F.H. HARBISON of Princeton University is, therefore, quite right when saying:²⁾

The shortage of technicians, nurses ... technical supervisors and other sub-professional personnel is generally even more critical than the shortage of fully qualified professionals.

This so, because they are representing the bulk of the employees and their demand exceeds that for senior officials by many times. Consequently, for achieving a high effectiveness of training manpower for the various fields of specialization and degrees of qualification, detailed long-term educational programs and plans of vocational training should be draw up. They are closely to be bound with long-term plans of scientific-technical and socioeconomic development so as to make sure a real consistency between the forthcoming needs of the country and the contents of respective training.

When concluding now the whole paragraph, it becomes obvious that like all the other plans prognostic estimations must also be balanced from the very beginning. Unquetionably, this will bring about a lot of difficulties since respective figures are usually rough ones only and not well-founded in any case. But, for ensuring their reality and further implementation, balancing

 F.H. Harbison: Human resources development planning in modernising economies, Geneva 1962, International Labour Office, page 6
2) Ibidem, page 3. has to be started with already at this stage of planning to be confined afterwards, i.e., when drafting prospective and shortterm plans.

The main fields of balancing to be considered in this context are, beside the indicated factors as science and technique, demand, research capacity and manpower, above all:

- necessary financial means for realizing objectives,
- possible financing of the projects,
- supply with necessary machines, equipment, raw materials, etc.

Again, these problems cannot solely be solved by the industrial branches but only in close collaboration between the management of branches and responsible state authorities. That is also the reason why prognostic estimations are not elaborated successively at the different levels of national economy but rather at the same time and simultaneously for the various fields of socioeconomic activities of the country concerned.

2.2 Prospective planning

2.2.1 Main features and tasks

Prospective planning of industry forms the second stage within long-term planning and contains the formulation of targets and the preparation of their implementation for a somewhat shorter space of time. Since the main goals of industrial development are to be fixed in prognostic estimations or special programs of starting industrialization in developing countries, objectives for drawing up prospective plans are to be derived from them by critically estimating their reality at present and the level of their realization. This was stressed, for instance, in the outline of Indian's Third Five Year Plan in saying:¹

¹⁾ Third Five Year Plan, Planning Commission, Government of India, published June 1960, page 4.

For a nation to lift itself from a state of poverty and enter upon the process of dynamic growth is a task that calls for a long sustained effort. It was for this reason that in the First Plan the problem of development was visualized over a period of 25 or 30 years and the immediate five-year period was considered in this broader context. Although, for certain purposes it is convenient to divide the process of development into shorter spans, in reality it forms one continuous whole in which the priorities and objectives for each are linked with a larger perspective.

At the same time, it has to be stated, drafting of prospective plans is not only a mere specification of that long-dated targets but also a rec-iprocal process aimed at checking prognostic estimations and, if needed, rectifying them according to the know ledge achieved up to that day. And that goes generally for the foreseen trends of national economic development and the expected ways of their implementation.

Accordingly, the differences between prognostic estimations and prospective plans are not only a matter of the space of time covered by them. There are rather different qualities of planning aiming at fulfilling specific tasks. And that, while prognostic estimations are elaborated so as to determine general development trends of national economy and its main sectors, prospective plans are intended to initiate their implementation by giving prominence to definite branches, the building up or the technico-economic progress of which is supposed to be a necessary cornerstone for a speedy economic growth of various other industrial branches or of national economy as a whole.

So the general tendencies of development are becoming effective by specifying their objectives in the course of prospective planning. Such a strategy of planning is already followed in some progressed developing countries and the success attained justified - in spite of all the difficulties and shortcomings the applied procedure.¹⁾ This comes particularly true in case of the UAR where decisive economic alterations have taken place because of the priority of development of single industrial branches, although the complete advantages, of building up metallurgy, for example, have not yet been achieved. Yet, industrial development in the UAR led already to the fact that per capita income was nearly doubled within 10 years (from 1950 to 1960) notwithstanding the rapid increase in population.²⁾

This shows, prospective planning of industry has been proved to be necessary and useful at the same time and priority of development of single branches and within them must be regarded as an indispensable ingredient of it. Whatsoever priority will be given to, a high effectiveness can only be made sure when coordinating activities of this leading branch within national economy and between and within industrial branches. As to that, particular stress is laid upon in the outline of India's Third Five Year Plan:³)

> Within each field in the sector of industry ... there is need for careful priorities, so that adjustments can be made readily. Secondly, programmes in these sectors should be worked out in a coordinated manner. Connected projects should be implemented as schemes closely related to one another, so that there is satisfactory phasing, and the expenditure incurred on each group of projects yield the maximum return

To accomplish this, it should be noted that - like prognostic estimations-prospective planning cannot be executed once and then stopped until a new prospective plan is to be drafted. The very nature of technico-economic development requires rather a continuous

1) This is especially to be underlined because of some criticism on India's planning policy related, for instance, to the development of heavy industry. In this criticism only the problems and deficiencies have been dealt with, without in our opinion, considering in a proper way the entire effects on economic growth and social development. A typical example for such a one-sided analysis is given by P.T. Bauer, Indian economic policy and development, New York 1960

- 2) According to United Nations Annual Report for 1960.
- 3) Third Flve Year Plan, Planning Commission, Government of India, June 1960, page 2.

planning of forthcoming tasks in all the sectors and at all levels of hational economy. It implementation demands a thorough observance of main trends in science, technique, demand, etc. and of their specific repercussions on the activity of the branch in question. That means, tasks of research, production, investments otc. have to be specified accordingly.

In general, these alterations should be discussed and, if necessary, taken over in the prospective plans in connection with, for instance, the preparation of annual plans so that always a period from 5 years to 7 years is planned in advance. Since this cannot be done anyhow, special institutions or departments, solely charged with prospective planning, have - at least partly been established in developing countries and notably in industrially developed countries.

In case of industrial branches in the European socialist countries, respective departments or sections are mainly affiliated to organizations of public industrial enterprises in order to enable their management to bear the responsibility for the respective economic units, the economic success of which depends mainly upon a high quality of prospective planning.

2.2.2. Indicators of prospective plans

In practice, objectives of prospective plans cannot be formulated in such a pure qualitative manner only. The single tasks are rather to be fixed qualitatively and quantitatively as well. And this is done by means of technico-economic indicators representing very necessary instruments so as to characterize technico-economic relations between national economy and industrial branches¹) and technico-economic development of industrial branches themselves.

1) Problems of indicators used for the national economic planning of development of sectors and branches are dealt with in Memo. No. 599 part III, chapter 2, of the INP, Cairo. As to the latter, development of indicators is generally marked by a trend of concentrating on only a very few but highly expressive indicators - this depends, of course, on the reached level of planning and skillness of those to be engaged in - characterizing technico-economic progress in such a way activities of factories and branches in the respective field can be embodied into that of national economy as a whole. The main fields of applying indicators for these purposes are:

- qualitative and quantitative development of main groups of products,
- preparation and introduction of new results of research and development,
- cost and price of main products,
- composition and qualification of manpower, etc.

Besides these indicators relative to immediate production and its economic results, some combined indices are to be used showing, for instance,

- utilization of fixed assets,
- utilization of productive capital,
- degree of rentability of the economic unit, etc.

The contents of the first group of indicators is necessarily and chiefly determined by the kind of production dominating in the branch, i.e. they are related to the products themselves. This goes especially for those indicators being used in order to coordinate productive activities between industrial branches and between industrial enterprises affiliated to them (e.g. demand for raw-material and output of production in physical terms). Therefore, these indicators are different ones and not comparable and must be determined separately for every branch concerned. Additionally, for centrally co-ordinating productive activities, there must be some indicators, too, marked by the same contents, which can be provided by all the industrial branches. These are, above all, indicators expressing development of production by using value terms as gross production, commodity production and so on.¹⁾

Similar problems are arising with regard to indicators of research and development, cost and price and manpower. In any case, those indicators are to be formulated needed for meeting requirements of conducting reproduction process, that means, they have to have such a quality responsible authorities or managers can actually use them for preparing new decisions or controlling effects of decisions taken in the past. Since every planning and control of indicators costs time and money, their number should be limited to such an optimum ensuring fulfilment of that specific tasks application of indicators is intended for.

While the firstly mentioned group is based on the requirements of organizing reproduction process, the second group is expected to reflect its economic results compared with spent input of financial means. These indicators are generally expressed in value terms and because of their general contents they are applicable to all the industrial branches. Therefore, they are to be used for the sake of comparing effectiveness of aggregate economic units in different branches. Indicators belonging to this group are, for instance, rate of used fixed capital, intensity of funds, utilization of funds, rate of profitableness, etc.

Both the groups of indicators are serving needs of planning and statistic alike. In case of using them for planning,

1) C.f. Memo. No. 596, Planning of Production, Part I, of the INP, Cairo.

that is to formulate objectives to be attained during the foreseen planning period, their fulfilment is to be stimulated by means of economic levers. These economic levers as profit, amount of bonus funds of industrial enterprises etc. are as exactly to be planned as productive targets themselves in order to give economic units actual material incentives interesting them in production according to the needs of national economy. That is why planning of technico-economic aims and determination of economic levers should be considered two sides of one task to ensure a highly effective production corresponding to internal and external needs. This is all the more important the higher the degree of responsibility of organizations of industrial enterprises or enterprises themselves for the organization of reproduction process.

Hence, it has steadily to be controlled whether the applied system of indicators and material incentives coincides with the conditions given and, if needed, we have to alter them according to the circumstances newly arising. From this it appears, simultaneously, such alterations cannot be started with after having the indicators used already led to undesired results but must be done before hand on basis of a continuous analysis of their actual effects.

2.2.3. Main fields of prospective planning

The fields of prospective planning are accounted for by the conditions of conducting production and reproduction process. That means, they have to involve the main stages of reproduction process as

- preparation,
- manufacturing and
- realization

of industrial production and the requirements to be met by the single elements of production process.

There is, however, no rigid scheme of plans needed within the frame of prospective planning and no description of how to build up the single plans themselves. This depends upon the conditions of production, the level of and experiences in planning and it is finally up to the respective authorities to decide what detailed procedure of planning is to be applied.

In spite of this, the following fields of planning and the mentioned problems of drafting the single plans can be looked upon as generally valid ones to be solved under various conditions of a comprehensive planning of production.

a) Research and development

Again, like the elaboration of prognostic estimations, planning of research and development must also be given prominence when drawing up prospective plans of organizations of industrial enterprises or enterprises themselves. This so, because all the other activities as planning of production, development of productivity and so on are, as a matter of fact, decisively influenced by the development and utilization of new results of science and technique.

Elaboration of prospective plans of research and development itself is marked by three main items:

- determination of topics of research and development,
- preparation of implementing research activities,
- preparation of introducing new results of research and development into production.

The topics of research and development are to be specified on the basis of the requirements of main trends of science and technique and the development of demand.

Proceeding from the foreseen topics, it has to be estimated whether respective tasks can be tackled and solved solely

within research institutions of the branch concerned or other institutions should participate in because of the very nature of the problems. Inasmuch as research institutions outside of the respective branch are to be included, timing of the project preceds drafting of prospective plans, i.e. the time schedule of the project is negotiated upon by the different institutions to be engaged in before taking over the partial tasks in the prospective plan. And that in order to avoid that drafted prospective plans handed over to superior or regional authorities must be changed because these preliminary activities were not carried out in a thorough manner. Since such alterations may cause a certain "chain reaction" of necessary changings in other branches or sectors of national economy, they should be kept as low as possible. Thus, for making sure a high quality of prospective plans, internal tasks of research institutions concerning a certain project should be discussed and agreed upon beforehand.

This represents also a very important precondition for a continuous transition of new results of research and development into production. In this field, there are still a lot of dificiencies in both industrially developed and developing countries hampering the full use of the latest results of science and techniques.

India's problems concerning arising when introducing completed research activities into production, the following critical estimation is given in the Third Five Year Plan:¹⁾

> There is still a wide gap between the completion of research in any field and the practical application of the results obtained. This is accounted for by a variety of reasons such as reluctance on the part of industry and Government departments to undertake extensive trial of new processes and techniques evolved

1) C.f. Third Year Plan of India, ibidem, page 141.

as a result of research within the country, inadequacy of pilot plant facilities, lack of designs organisations and paucity of engineers and consultants for designing and fabricating production plants. The need for eliminating these shortcomings is realized and the Third Plan will include proposals for achieving this object.

Thus, there is no arguing the point, deficiencies in prospective planning are some of the main reasons of mentioned difficulties. If, for instance, partial tasks are adequately fixed and co-ordinated within prospective plans and their fulfilment is bound with economic levers, institutions in question are legally and materially being forced to do their very best so as to accomplish targets set due to schedule. To let economic levers become effective demands, however, the single institutions - and that holds also true with regard to independent public research institutions - are conducted according to the system of economic accountancy or economies self-support.¹

b) Production

Economic levers should be applied, however, to both the sides, i.e. to those being responsible for the preparation of new technique and to those charged with implementing its results likewise. Thus, the problem of prospective planning of production comes into the force, for, finally, industrial research and development aims at nothing but improving the quality and assortment of goods and the conditions or effectiveness of production. As introduction of these amendments is usually connected with some difficulties, additional financial expenditures and, of course, always a certain economic risk, sometimes factories are reluctant to take over a new production. Sooner or later, however, this retention of a traditional production will lead to much more trouble because of the fact that obsolete goods can never effectively be sold neither on home much less on foreign

1) C.f. also Memo. No. 617, part I, Planning of research and development, of the INP, Cairo.

markets. Hence, industrial enterprises should be prevented from such an attitude towards technical progress from the very beginning. And that again by using economic levers being effective, for example, in a twofold way, on the one hand, by reducing prices for products unchangingly fabricated for some years and, on the other hand, by granting higher prices for technically up-todate goods newly introduced into production. This will put pressure on the industrial branches and their factories not only to be open-minded to technical improvements but to look by themselves for suitable results of research activities to be materialized in their production. Moreover, industrial branches and factories themselves will contact research institutions with the view to getting a hand in solving their problems and to concluding contracts on scientific-technical cooperation in various fields of mutual interest.

Consequently, a main task of prospective planning of production consists in finding, out those topics of research to be led up to production in order to keep up with technical progress and to increase effectiveness of production as a whole.

Selection of topics concerns, however, only one side of the problem. For preparing a highly efficient production, the new products, for instance, and the likely demand for them must be known. To investigate demand is a very comprehensive task usually not to be solved by one factory but only within the frame of one industrial branch or even in close collaboration between various sectors of national economy.¹⁾ The contents and procedure of that investigation depends merely on the two main groups of production - producer goods and consumer goods - and within these groups on the duration of production cycle.

1) C.f. Memo. No. 597, part II, Investigation of demand and market, of the INP, Cairo. As to producer goods, their production process exceeds usually the period of medium-term planning, e.g. one year. In this case, production process has already to be started with in the preceding year and, thereupon, production of such goods also to be determined in sufficient details when drafting prospective plans.

Regarding consumer goods, their production process, also for such durable goods as cars, refrigerators etc., does not exceed one year but lasts rather only days or hours. Furthermore, features of these products are more or less influenced by the time of the year and by fashion and those determining the latter.

So, it becomes obvious that prospective planning of production must be a different one according to mentioned different conditions of production. While in case of long-lasting production prospective plans have already to contain a lot of particulars as to single products and their components, such details must not and cannot be given as regards, for instance, prospective planning of consumer goods.

Therefore, investigation of demand in connection with prospective planning must be different, too. It must be all the more detailed the longer lasting production and vice versa. That means, in as far as a new equipment for a chemical factory is to be delivered, the main data of this project must already be known 5 to 7 years in advance. At the same time, main stages of production have to be distributed within this period of time so as to wind up manufacturing of entire equipment in time.

We are able to state, therefore, that under such conditions single tasks of a project must already qualitatively, quantitatively and temporally be fixed within prospective plans. Since consumer goods are subjected to indicated and, somtimes, very decisive qualitative alterations, they should not be determined in such particulars. What is to be done is to analyse their trends of development from the technical and economic point of view and, what is urgently needed, to investigate the likely quantitative development of demand especially on the home market. And this goes notably for developing countries where industrialization is very often commenced in the field of producing industrial consumer goods.

c) Investments

Owing to the fact that any industrial production newly to be started will, by and large, cause certain changings in production process hitherto applied, respective requirements have to be investigated and the supply with all the necessary means of production, raw and auxiliary materials be prepared in advance. The tasks and problems are again different within single branches and that due to the kind of production and duration of production process - but whatsoever the demand will be the new machinery, materials and so on are usually not provided from one day to ano-Therefore, after having investigated demand and determined ther. the likely volume of saleable goods, all the necessary prerequisites for the new production must be fixed and their supply be negotiated upon enabling respective producer to take over relevant tasks into their prospective plans of production or, if needed, of research and development, too.

What does this determination imply?

Regarding new means of production, it has, at first, to be estimated whether existing productive capacities will be sufficient to meet qualitatively and temporally the expected demand. That is meant, productive capacity is to be calculated by considering those changings in the future production affecting size of productive capacity and the degree of its utilization. To say it in other words, productive capacity has to be analysed from the point of view whether available machines and workers are able to meet the qualitative requirements of forthcoming production. Out of such an analysis, some conclusions can be drawn concerning necessary amendments of means of production or even completely new investments as well as concerning necessary measures for increasing qualification of workers. Obviously, these analyses and their results will be the more exact the more detailed already the future objectives of production.

The next step is expected to be a quantitative comparison between productive capacities available and the requirements derived from the planned production program. For that, the following tasks must be tackled:¹⁾

- quantitative estimation of existing productive capac-
- determination of that part of existing productive capacities to be used for manufacturing different kinds of production especially those newly to be introduced,
- estimation of effects of technical improvements and increase of labour productivity on productive capacity and the degree of its utilization,
- balancing of requirements and productive capacity and determination of bottlenecks,
- elaboration of proposals for closing the gaps by including other factories of the branch in that production or by expanding productive capacities of that factory mainly engaged in the production in question.

From this it appears, prospective planning of necessary investments for the future production forms a very comprehensive process. Since any new investment will influence the financial position of the factory or branch concerned, they are to be calculated very thoroughly in order to ensure a highly efficient fabrication of the single goods in the future.

1) C.f. Memo. No. 597, part III, Planning of productive capacity, of the INP, Cairo.

d) Material

As regards the prospective planning of supply with necessary material, the following problems must be taken into consideration.

-38-

Firstly, in case of materials being available on the home market, it has to be made sure whether they are also to be produced in the future and whether the needs of the factory or branch can be covered by that production quantitatively and temporally as well. If so, on basis of the prospective plans of production, commercial contracts should be concluded between both the responsible institutions. And this is going to be^f benefit for either side. The producing factory is able, for instance, to prepare respective production long-datedly and in a very profound manner aiming at reaching a high economic efficiency. On the other hand, the consuming factory will be allowed to ask, if need arises, for special fabrications which are expected to fit in with its intensions best.

By that, secondly, the problems connected with the demand for new materials have already been touched. Needless to say that any production will be the more effective the more the materials are prepared for these special purposes. Such a system can, however, only be followed inasmuch as large-scale production is concerned. In all the other cases consuming factories have to use standardized assortments of material produced in large quantity for various consumers.

Sometimes, it may occur that the start of a new production depends inevitably upon a very specific quality of material not on the market for the time being. Then, the consuming factory is forced to inquire after a factory being able to provide it with desired materials. And again, the conditions are all the better the earlier the demand is raised. In so doing, produc-ing factory will have some time to undertake necessary research and other preparatory activities and, if the demand for the new material is up till now low, to look for other consumer so as to reach an economicly effective production,

For as against producer goods, consumer goods are not qualitatively determined in such details in advance, prospective planning of necessary materials has to have another contents, too.

To meet, for example, requirements of fashion, production of respective materials must rather be flexible. Such conditions are given, for example, in textile industry because of the short production process. In spite of this, factories of textile industry have also to know beforehand which quantities will likely be needed and these figures have to be determined by the branches of those enterprises producing ready-made clothes in close collaboration with the trade organizations in question. Furthermore, if there will arise, for instance, a demand for new synthetic fibres, their production must also be prepared longdatedly and the same tasks have to be tackled as mentioned before concerning production of other new materials.

So far, prospective planning of internal physical relations has only been dealt with, this so, because developing countries should build up their industrial production by using, first and foremost, their own material resources. To a certain extent, they will be forced - especially during initial stages of industrialization - to import certain raw materials and semi-finished goods.

The necess-ity of exchanging semi-finished goods will be growing, on other conditions, however, in line with the steadily increasing division of labour between all the countries. But, these collaboration will only become a successful one if it is based on the principle of mutual advantage and on long-term agreements, derived, in turn, from long-term plans of development of national

-39-

economy and industry alike and concluded between countries marked by the same or, at least, similar socio-economic conditions. This represents, however, a mere problem of national economic planning and is, therefore, to be neglected in this context.

e) Manpower

To accomplish this chapter on the main fields of prospective planning, some remarks on the determination of the qualitative and quantitative demand for manpower.

The qualification of manpower required is again determined by the development of science and technique and this is true, as a matter of fact, of all the levels of skillness. If, for instance, there is a trend towards a higher degree of using electrical equipments for operating and steering machines, scientific-technical personnel in research and development institutions must be trained adequately. Additionally, the share of those being highly specialized in this respective field is going to be an increasing one, too.

Similar alterations have to be prepared as to those manufacturing or operating the new technique, i.e. foremen, skilled workers and reparing and adjusting personnel. In result of such technical changings it can even happen that traditional trades and professions will disappear and new ones appear. Such a development can be observed, for example, in chemical industry where decisive alterations in production have taken place in recent years.

The qualitative determination of required manpower is, however, not sufficient. What is also needed is the share of different fields of specialization and the degree of qualification in the total number of employees. This kind of forecasting is very difficult a task and will never be exact up to the last figure. Nevertheless, these tasks must be tackled and their solution forms one of the cornerstones of entire prospective planning because of the fact that all the other objectives of prospective planning are only going to be reached if adequate manpower is available. Therefore, it is quite right to lay such a stress upon estimation of demand of manpower as it is done, for example, in India's Third Five Year Plan devoting a whole chapter to these problems.¹⁾

How to cope now with these problems?

The main data are to be derived from the foreseen development and introduction of new technique, i.e. qualitative standards set are gathered from the elaborated documentations of research and development. They are quantitatively to be completed by the needs arising out of the implementation of foressen production programs.

It should be noted in this/context that the qualitative contents of workers' abilities required for mastering forthcoming production is subjected to decisive alterations. And that, there are not any longer dominating such strongly specialized trades as locksmith, turner, etc. but because of the mechanization and automation of production such new trades are coming into being as operators of automized machine systems and others. These workers must comprehensively be qualified but can afterwards be employed for producing various kinds of new products.

Proceeding from this by using already existing experiences of other already progressed branches within one's own or other countries and by analysing the forthcoming production, necessary degree of qualification and share of various groups of employees in the total of managerial personnel, sub-professionals and productive workers is to be determined. These analyses will lead to, at least, the approximate needs to be specified in the course of short-term planning. The latter goes especially for productive

1) Ibidem, chapter VII

workers who can, being already highly skilled, be retrained in a rather short space of time. Hence, the calculation of forthcoming demand within the frame of prospective planning must be all the more exact the higher the degree of specialization and skillness, because of the duration of training, that means, some of the problems have to be decided upon already at the time prognostic estimations are being elaborated.

Till now, only the determination of demand has been treated. Prospective planning of manpower includes, however, more namely to suggest necessary measures so as to meet this newly arising demand. Owing to the division of labour in national economy, various institutions will take part in this training and it is well known that highly skilled manpower is, above all, trained at universities and colleges. Industry will mainly share in these duties as to the training and ret-raining of sub-professionals and productive workers. That is to say, industrial branches are expected to establish technical schools or training centres for sub-professionals and productive workers and to reorganize basic training of productive workers in line with the future needs.

Since all these activities will require material and financial means for over a long period, they are already to be planned within the frame of prospective plans.

Summarizingly, it can be stated that prospective planning for being really effective must be carried out comprehensively by giving prominence to the development of science and technique. All the other fields are based upon planning of technical development or they are decisively influenced by it.

Furthermore, central management within the public sector of industry is considered to be the most favourable precondition for elaborating the various kinds of long-term plans and prospective plans in particular. This so, because all relevant potentials of enterprises and branches can be concentrated upon and partial activities undertaken in a co-ordinated manner.

Methodical questions are subordinated to the solution of main tasks. Planning methods, planning forms, etc. have to serve fulfilment of analysed main objectives and it depends upon the creative faculties and the experiences of planners to design such planning instrument serving best a high quality of drafting and balancing prospective plans.

the part outputs of the mean allot tilly should be the surgery

and the addition to the start is the second started in the

aleas static of grainers as here and the wind the fittless

Thursdal assistion over a long period, they due stready to t

Southernors, cantral manegement within the public actions during it considered to be the most five the post five the president of the presiden

placed the variants kinds of long-bernightan and sold placed

lennin eritected to enerit and dinair bacaral

or they are decisively tafinered by it.

ensit visite lifes and colleges. Industry will plante as the