UNITED ARAB REPUBLIC

THE INSTITUTE OF NATIONAL PLANNING

Memo. No. 927

Problems of Long-term Planning in the German Democratic Republic

By

Prof. Dr. Manfred Engert

October 1969

CAIRO
3, MOHAMED MAZHAR - ZAMALEK

"Opinions Expressed and Positions Taken by Authors are Entirely their Own and do not Necessarily Reflect the Views of the Institute of National Planning".

Problems of Long-term Planning in the German Democratic Republic

by Prof.Dr. Manfred Engert; University of Economics,Berlin

(This note gives a summary of the main points of two lecturers that been held at the I.N.P. in October 1969; it is not an elaborate memo.)

Presently, basic changes take place in the G.D.R. economy and its planning system. In particular, this is true with respect to the central planning. In this field one of the most remarkable trends is that increasing emphasis is put on long-term policies and on long-term planning. The approach to long-term planning is completely new, which means that there is no simple extension of the time horizon of planning activities.

Real life prompts to attach more importance to long-term planning for the following main reasons:-

(i) The dimension of problems (economic,technological,social etc.) in a modern economy is rapidly growing. Most of these problems tend to be national (or even international) ones rather than sectoral ones.

(ii) Resources and funds needed for the solution of such problems are becoming more and more tremendous. As a role, they go beyond the economic power of big companies or even industries.

(iii) The comprehensive (complex) character of such problems is evident. Therefore, solutions on a large scale,mostly at the national one, are required.

(iv) The problems mentioned usually affect many other sectors of the economy; overall, comprehensive measures are essential.

Consequently, more time is needed for studying these problems and for drafting adequate plans, to solve these problems. The prevailing way of thinking in planning and of dealing with the problems of economic development must be, therefore, a strategic one. We have to adjust our planning to modern trends in technology and society. This requires a re-considering of present principles and methods of planning as well as a critical evaluation of our experience in this respect.

The problem we face involves a rather contradictory issue= We must plan for more years ahead than we did before but our knowledge about the far future, naturally, is rather limited. On the other hand decisions in the plan on long-term problems must be accurate since they will affect all the economy and their basic trends. In other words: Decisions must be precise for a future which we do not know precisely.

Three main steps have been taken to solve this problem.

(i) Strengthening of central planning parallel to an extension of independent planning at lower levels.

(ii) Concentration of central planning on long-term projects (strategic top-priority targets).

(iii) New approach to setting up the medium-term plans (5-year-plans).

This paper deals with point (iii) only.

The new approach calls for genuine scientific planning and, therefore, preparatory stages in the planning process are of much more importance than before. Actually, this means more steps of drafting and re-drafting the main targets and more time for thorough studies of all implications of the targets under discussion.

In order to make quite clear what the new approach really is an outline of the previous way of elaborating the 5 year plan will be given in a somehow simplified way. Previously, 5 year plans had been set up according to

- the level reached in the base year, or, in other words, according to the implementation of the preceding plan.
- the bottlenecks or problems of, say, disequilibrium which had been revealed or which developed during that previous plan.

So, the new plan had to solve present problems according to the present state of affairs in the economy and based on the present way of understanding of (and present knowledge about) problems. This was some kind of linear approach. Now planning starts from the problems we shall face from the problems which are likely to come. Appart from an analysis of present conditions in the economy most attention is directed to the conditions that will prevail many years ahead. Thus, planning will assume a new function: It has to find out those future problems which we shall face and which have to be solved by the next plan (s). Planning has to 'produce' knowledge about the future of the economy and related fields, about future trends which will take place far ahead. It has to prepare the theoretical fundament from which later on plan targets can be derived. The Planning process now does not start with drafting targets but rather with an appraisal of future trends in all respective fields of economy, science, technology, society etc. First comes the scientist before the policy maker will take decisions on the objectives of the plan.

Since preparatory activities in long-term planning became more important, a new scheme of setting up the 5 year plans was developed in G.D.R.:

(i) Prognostic projections

(ii) Programme for structural policy

(i.e. policy for sectoral development and industrialization)

(iii) Drafting the 5 year plan

a) Drafting the targets for the top-priority projects.

b) Drafting the comprehensive 5 year plan

(iv) Drafting the annual plans.

The setps (i) and (ii) are new; so is the elaboration of the 5 year plan in two minor steps.

Prognostic projections

A big programme of long-term (prognostic) projections was started in 1967 as a result of the new system of national planning. Prognostic projections are detailed studies on the objective trends and results of future development in science, technology, economy etc. They give a theoretical description of these trends,and they tell the planner and decision-maker what objectively will and/or can possibly take place in future (and not what should take place or what would be desirable). So, in the initial stage of such prognostic projections there will be no evaluation or appraisal with a view to fixing plan targets. Actually, this means that prognostice projections both

- are based on the presently knwon objective laws of economic, technological etc. development
- and aim at detecting new objective laws.

Thus, science will play its emminent role as one of the most important factors of modern development. In fact,it has to be regarded as decisive productive force of the country.

In the planning process prognostic projections have assumed two main functions:

(i) to prepare background studies,knowledge and ideas as a basis for decision-making;they are decision-preparing activities.

(ii) to outline the scope of possible trends and, therefore, the scope of plan-decisions; they have to fix the range within which the decisions that will be taken in the subsequent stages of planning are realistic.

Prognostic projections can be defined as a system of forecasts (or predictions) aiming at several possible strategies in the respective field which all are within the range of the forecast objective trends. Whereas the plan is a system of selected strategies with compulsory targets for all sectors and units of the economy; these strategies are taken from those offered by the prognostic projections.

The system of prognostic projections in G.D.R.

In the G.D.R.-economy a big programme for prognostic forecasts was started several years ago. Initially, it was a business at the factory level covering mainly technological trends. It was based on references and other accessable information from all over the world in the respective fields. An immense number of data had been compiled and evaluated. It served as a fundament for planning in the companies and, partly, for some planning activities at higher levels. The problem, however, was how these projections would fit together. They hardly could be used for the national planning. Central planning authorities had found it impossible to take adequate decisions because the results of the unnumerous prognostic projections were too diverging as regards their impact on the whole economy. Moreover, they neglected to a large extent the developmental capacity of the country.

To remedy this it had been decided:

first to abandon the idea of mainly projecting technological trends; they had further to be undertaken together with studies on the economic implications (in terms of cost, resources needed etc.)

second to develop a general system of prognostic projections at all levels but with giving preference to a selected number of central forecasts.

So, certain decisions were taken before the large-scale projecting programme was launched in 1967/68:

(i) All projecting activities will be under direct supervision by the government.

(ii) Subject to central projections will be some selected fields and sectors which most probably will be the essential ones for the G.D.R.-economy in future.

(ii) All prognostic projections should be concentrated on such variants in the respective fields which will lead to the biggest increase in national income.

At the central level about 20 standing comitees were formed which were headed usually by outstanding scientists or other experts in the respective fields. Members to these teams had been appointed ministers, scientists, company directors, engineers and others. It was the idea that all prognostic projections (with one exception) be carried out apart from the day-to-day performance in the ministries, planning authorities etc. in order to avoid using traditional methods of long-term planning in this new business. The task of prognostic projections was brandnew so new methods should be developed and new ways of thinking on economy and technology had to be found unhampered by the current affairs and problems in planning.

This required some revolutionary change in studying economic problems. This is confirmed by the following. If we assume that human knowledge in science and technology is doubling once every 6 to 7 years, projections undertaken now and covering the period up to 1980 can be based only on 1/3 of the knowledge which will be available in the final year.

Amongst the central standing comitees were e.g.:-

- natural resources
- technology in chemical industries
- power generation
- automation

- education
- demographic trends
- technology in metal-processing
- agriculture
- transport
- main factors of development

The time horizon, however, was different depending upon the subject under study. In the field of electric power generation projections can be made for more than 20 years ahead whereas forecasts of certain technologies in chemical industries or, say, in electronics would not exceed a period of 4 to 7 years. In general, the standing comitees had been asked to cover the period up to 1980 by their studies however rough their results would be.

In addition to the system of central prognostic projections similar forecasts at the lower levels went on.

Prognostic projection on the main factors of development

The most important part of the general system of prognostic projections is called prognostic projection of main factors of (economic) development. It is a framework for all the others serving as criterion whether they are feasable or to what extent they are. It has been felt that such a frame is necessary because the various forecasting studies should prepare for decisions on economic policy,they, therefore, have to be channalled into a definite range of variants which is conducive to the capacity of the whole national economy.

The projection mentioned is the central one. It is carried out by the supreme planning authority, the State Planning Commission. It is both the starting point for all other prognostic projections and the final study into which all projections (and mainly the technological ones) have to fit as regards their impact on the main economic resources,proportions and factors. The main functions of the prognostic projection of the main factors of economic development are:

(i) To prepare a comprehensive study of long-term trends in the national economy as a whole. It aims at forecasting the system of basic economic proportions related to the national income and its distribution. Also, it has to evaluate the impacts of main factors of development on the increase of national income.

(ii) To serve as basic projection for assessing the efficiency of all other prognostic projections with respect to their impact on the national income and their requirements in national resources.

The prognostic projection of main factors of economic development has five chapters:

- main trends in science and technology
- main trends in manpower

- main trends in natural resources
- main trends of basic economic proportions
- main trends in foreign economic relations (international division of labour)

What follows is an outline of projecting the basic proportions of the economy given by points.

This prognostic projection is intented to calculate

i) the volume of national income at the end of the period under discussion (this includes,naturally,an estimation of the rate of growth of national income,and

ii) to draft a tentative scheme for distribution of the forecast national income

The whole projection is based on two assumptions:-

First: The national income depends upon the number of productive manpower and their labour productivity

Second: Both,labour productivity and the volume of productive labour force are directly connected with the efficiency in using the means of production (mainly fixed assets)

Accordingly,several steps had been undertaken in fulfillment of the mentioned task of the projection of basic proportions of the national economy:-

Step 1 : Forecast of the number of productive manpower

From the prognostic projection of general demographic trends the number of people in the working age had been taken which was the basic data for making an assumption about the percentage of this age group that will be engaged in the productive sectors (because the service sector does not produce any national income; it is regarded non-productive). This assumption was derived from current statistics and from an evaluation of international trends. It resulted in a smaller ratio compared with the present ratio. Now the number of people in the working age who will be on training

during the period under study had to be deducted; this number was calculated according to the results coming from the general prognostic projection on education. Next came an estimation of the ratio of women in the working age who will not be able to work. This ratio presently is about 25 to 28 percent. It will decrease as a result of various measures in the social field (e.g. kindergattens, nurseries etc.).Finally, an estimated number of pensioneers who will still hold their jobs had to be added. About 20 percent of all pensioneers are now still working. Due to many factors this ratio will increase.

These estimations resulted in the number of manpower available MP (available) in the period under study.

Step 2: Caculation of total working time

Starting from the present official working hours per week (45 hours) several variants of a possible reduction up to 1980 had been calculated followed by an estimation of working time per worker and per year (taking into consideration the annual paid holidays which now are 15 days as a minimum)= WT.

Multiplying the number of available manpower by the annual working time (MP available WT) we have total working time of all productive workers (WT total).

The very calculation are obviously elementary; the difficulties were in a sound forecast of such variables like ratio of women in the working age who will work or the ratio of manpower in the productive sectors. This requires a deep knowledge of basic social and economic trends and a big imaginatory capacity.

Step 3: Calculation of labour productivity

According to the results of the first chapter of the prognostic projection of main factors of development which dealt with the trends in science and technology an estimation was made of their impacts on productivity. For this calculation some assumptions were essential as regards the future

sectoral and branch structure of industry in the G.D.R.-economy as well as regards future improvements in the management of industries. This forecast had to bring together data (or assumptions) on future technology, structural changes and organisational resp. managerial trends.

The labour productivity, finally, was calculated in two forms:

- net product per worker $\left(\frac{N}{MP}\right)$ and
- net product per working hour $\left(\frac{N}{h}\right)$

This projection revealed that all the forecast increase in national income will stem from an increase of productivity only. There was no chance left for an increase of national income (net product) by additional manpower. It was found, furthermore, that under the conditions of the G.D.R.-economy the growth rate of labour productivity per hour must be higher than per worker :

$$\Delta' \frac{N}{h} > \Delta' \frac{N}{MP}$$

From this can be seen that one of the basic precondition for a rapid growth of national income is an intensification of production which directly results in a higher net product per working hour. Thus, large-scale mechanization and automation of industry and big improvements in management of productive sectors will rank first in economic policy for the future.

Step 4: Calculation of the volume of national income

With the results of the previous steps the total of national income was calculated on two lines:

Net product per worker multiplied by the number of workers and net product per working hour multiplied by the total of working hours.

$$\frac{N}{MP} \cdot MP_{(available)} = N_{(national\ income)}$$

$$\frac{N}{h} \cdot WT = N$$

Of course, some of these calculations at various steps had to be repeated in order to reach identical results on both lines or, at least, to reach an acceptable range of divergence between the two N.

An additional calculation was made for checking the results on N by assuming (in variants) annual rates of growth of national income ranging from 4.5 to 5.5 percent annually. This range is regarded to be realistic; present growth rates are not exceeding 5.5 percent p.a.

It was interesting for the planners to learn from all these projections that up to 1980 the rate of growth of manpower will at any case be far lower than 4.5 percent; if the rate of growth for the national income is assumed to reach its maximum (5.5 percent) then the growth rate of productivity per hour must be much higher than 5.5 per cent. This is an important indicator for the minimum requirements of technological and managerial innovations in industry.

The steps number 1 to 4 were all based on the first assumption that national income depends upon the productive manpower and their productivity. The subsequent steps were based on the second assumption that efficiency in using the means of production affects labour productivity.

Step 5: Estimation of future capital intensity and capital efficiency

It was assumed that as a result of technological progress the capital intensity (fixed assets or capital net product ratio; $\frac{FA}{N}$) will decrease. Accordingly, capital efficiency ($\frac{N}{FA}$) is expected to rise.

This would mean that the present trends of the G.D.R.-economy will turn to their opposite. For verification the forecast trends in technology of the most important industries (including projections of the organisational pattern of future industrial management) had to be analysed with a view to calculate their effect on the mentioned ratio of capital intensity. This ratio, probably, will drop by not less than 10 per cent during the period 1968. It is important to note that these calculations were not based on overall data of the capital net product ratio. Rather they went into technological details of industrial branches. Also the future structural pattern of the G.D.R.-industry has been taken into consideration.

Step 6: Calculation of the increase in fixed assets

Provided the estimations of capital intensity were fairly correct an attempt could be made to find the total of fixed assets which would be necessary for getting the national income that had been calculated in the previous steps.

N. $\frac{FA}{A} = FA_n$ (fixed assets in the final year, say, 1980)

From this follows $FA_n - FA_{(\text{base year})} = \triangle FA$.

Thus, we have arrived at the necessary increase of fixed assets during the whole period.

This is equal to the minimum capital accumulation required.

Step 7: Estimation of renewal of fixed assets.

By various methods the necessary amount for renewal of fixed assets was calculated. It had to be added to the minimum capital accumulation to the extent it would exceed total depreciation.

After this a rough estimation was carried out of the probable increase in reserves.

Thus, the steps 5 to 7 resulted in tentative data on the distribution of national income as regards accumulation:

FA + Renewal of fixed assets + increase in reserves = A

(A = accumulation)

(It is obvious that this calculation was related to the respective figures for the whole period of the prognostic projection. Equally, the national income of the same period had to be estimated; this note has shown the principle steps for calculating the national income in the final year only. As can be seen from the steps 1 to 4, however, there was no difficulty for this second estimation).

From the results of calculating the total national income and of step No.7 (A= accumulation) the following basic equation was derived:

$$N - A = C \quad (C = \text{consumption})$$

or $$A + C = N.$$

The rate of accumulation (A) could also easily be fixed : $\frac{A}{N} = A$

For checking these results another method was used for calculating the total of accumulation and consumption according to the mentioned basic equation A + C = N. This estimation started from an analysis of the present rate of accumulation (which is in G.D.R. about 22 p.c.) and international trends of this rate as well. Taking into account the requirements of technological progress and their impact on accumulation it was assumed that this rate has to be increased, at least, to 25 p.c. Accordingly, total accumulation out of the national income which was previously forecast could simply be calculated: $\frac{N. \quad A}{100} = A.$

Next came estimate of investment in research (not less than 3 p.c. of national income) and education based on the findings of the first chapters of the prognostic projection of main factors in economic development (A (research, education)).

The remainder of national income was now equal to total consumption:

$$N - A - A_{(\text{research, education})} = C$$

After this a separate forecast was started with a view to fix total consumption. This independent calculation was a large scale one taking into account that annually a minimum of increase in consumption renders necessary for financing various measures of the government for improving the standard of living in the country. This minimum amounts do not less than 1.5 billion Mark.

Concluding the forecasts which had been outlined in this note arrived at the following results:

National income (total and for the final year)
Rate of growth of national income
Accumulation (total)
Consumption (total)
Fixed assets (for the final year)
Rate of accumulation (A
Capital intensity
Labour productivity
Manpower (total and for productive and service sectors)

This part of the prognostic forecast of main factors in economic development was a first attempt to fix the general trends of the economy. However, due to certain defects in economic theory and to insufficient reliability of some data on the trends under study it does not yet represent a consistent model of the basic proportions of the national economy. However, it has solved many problems in preparing the next long-term plan in G.D.R. and, in addition, it encouraged further theoretical research in the respective field. Many problems, however, had become clearer as a result of this prognostic projection which is important for further progress in theory of planning.