A SYSTEMATIC APPROACH TO GOAL ANALYSIS AND EVALUATION OF SOCIO-ECONOMIC EFFECTS (WITH SPECIAL REFERENCE TO EDUCATIONAL PROGRAMMES)

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A systematic approach to goal analysis and evaluation of some economic effects (with special reference to educational programmes).

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A systematic approach to goal analysis and evaluation of socio-economic effects (with special reference to educational programs).

The main purpose of this paper is to discuss various methods to systematize goal formulations within the public sector.

Special attention will be paid to the methodological problems encountered when analyzing social rather than purely economic goals.

The present lack of social allocation theories and evaluation methods is striking in particular when considering that the corresponding fields in economic theories constitute major research areas. The increasing importance of the public sector and a unified social and economic approach to development underline the urgent need for a systematic analysis in this field.

Our level of ambition as regards these improvements must however be rather low as the theoretical base is missing as well as our knowledge about many of the important functional relationships within the public sector. We simply do not know the linkage between e g economic means and certain social ends.

The first question to be posed is of course what methodological approach we can apply in order to systematize and structure the problems to be discussed. Most of the available analytical tools as regards evaluation have been developed within the private sector and are - explicitly or implicitly - usually based on profit or growth goals. If these value premises of the method as such are not recognized when such a method is transferred into the public sector it may very well be that the method chosen rather than the public goals stated directs the allocation decisions and indicates what should be considered a success or failure.

Assume for example that we applied the traditional market based internal rate of return method as an allocative tool for educational programs. This method presupposes that the benefits from the program analysed are to be expressed in monetary terms. The incomes created through education thus become the benefits to be considered.

From this follows that the more income generated through an educational program the higher priority should it be given because a high internal rate of return in economic growth terms is considered to be the best indicator of a sound and productive investment.

Let us now apply this philosophy to reality as it exists. Is it in line with the existing political will to consider education of women less important than education of men in all societies where the men traditionally get the better paid jobs?

Should in service training of high income night-club managers be given a higher priority in the development plan than up-grading of low income agricultural extension workers?

Only if the policymakers answer questions such as these with "yes of course" can it be assumed that their goals and the implicit goals of the analytical tool are in line with each other.

If they on the other hand do not agree to the stated priorities then it must also be recognized that the market based internal rate of return figure is not a relevant indicator for establishing educational priorities and evaluating the success of a training program.

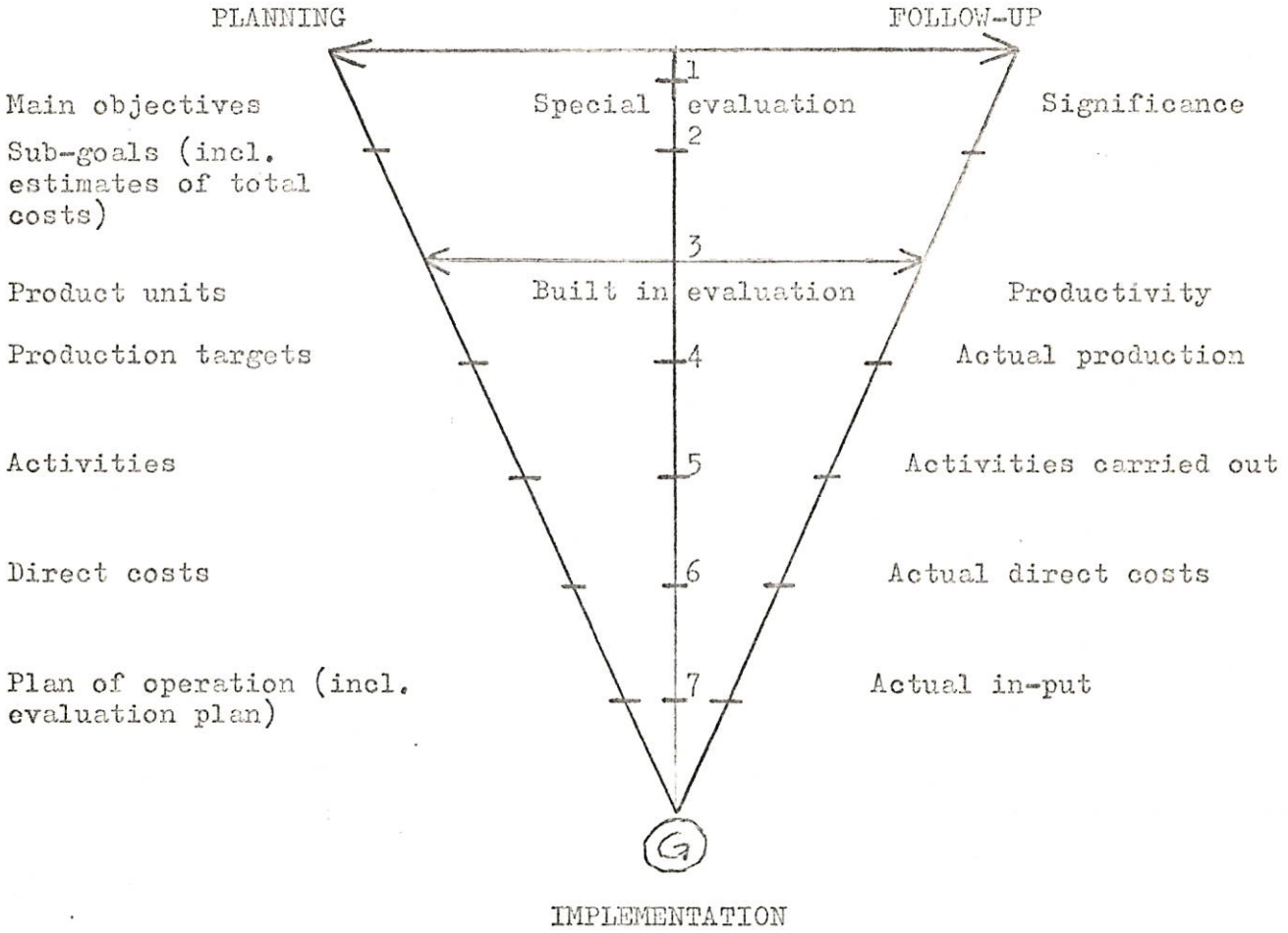
To claim - as sometimes happens - that the economies of the market are politically neutral only reveals either a narrow minded ignorance as regards alternatives or more likely a "technical" approach to policy making.

Instead the evaluator must derive the benefits as well as costs from the political goals stated. In order to carry out this task it may be useful to systematize the various steps and levels of evaluation.

1. A systematic approach to evaluation

Evaluation is a continuous process from the moment when a project idea is born to the day the results and effects of a certain project cannot be related to the objectives of the project. Project evaluation must thus be a continuous process integrated in the planning, implementation and follow up phases of the project.

This systematic approach to evaluation can be illustrated by the following figure.



The left wing of the "V" illustrates the planning phase starting with the analysis of main objectives which are then concretized into sub-goals, production targets, activities, cost estimates and implementation plans. The wheel at the bottom of the "V" feeds planned in-put into the implementation process. The right wing of the "V" shows the follow-up of actual results and effects. The comparisons between planned and actual results (level 7-3) is then defined as built-in evaluation and the comparisons between planned and actual effects (level 3-1) defined as special evaluation.

The V-model also enables us to distinguish between the following four basic concepts which are to constitute the corner stones in the evaluation:

- Planned significance = $\frac{\text{Planned fulfilment of main goals}}{\text{Estimated total costs}}$

- Planned productivity = $\frac{\text{Planned production targets}}{\text{Estimated direct costs}}$

- Real productivity = $\frac{\text{Real production}}{\text{Real direct costs}}$

- Real significance = $\frac{\text{Real fulfilment of main/sub goals}}{\text{Real total costs}}$

The terms will be used both in an ex-ante and ex-post meaning. To distinguish between the two we are going to talk about potential significance when applied to an ex-ante situation with potential goal fulfilment and potential (estimated) total costs. Real significance is then the term used for ex-post analysis as it is based on real goal fulfilment and real total costs. The same distinction is of course also made between potential productivity and real productivity.

The present trend in most economic literature only to consider the ex-ante concepts is misleading when not made explicit and can easily create the impression that the difference between e g potential and real significance is marginal and that no ex-post analysis therefore is necessary. Experiences, whenever observed and analyzed in a systematic manner, almost with no exceptions show how important it is to distinguish between data as estimated in the plan and as recorded in reality.

The "foundation" of this evaluative system thus consists of the analysis of objectives, goals and targets during the planning phase.

2. ANALYSIS OF PUBLIC GOALS

The importance of well defined goals can be described in terms of:

- Allocative power; the extent to which criteria for establishing priorities can be derived from the stated goals

- Management power; the extent to which program activities can be related to and guided by the stated goals

- Evaluation power; the extent to which progress made can be expressed in terms of the stated goals.

The first step in an analysis of an educational program is thus to define as clearly as possible the policies which are to form the base for the allocation decisions, management control and evaluation work.

Most analysts would theoretically agree to the statement that it is prerequisite for any analysis in the public sector to know what the policy makers want to achieve - that is being familiar with their goals. But in practice few analysts - in particular those using economic research methods - start off their work by trying to find out what these goals really are.

This theoretical acceptance but practical neglect of the political policies can partly be explained by the fact that goals are already implicitly given in most economic models partly by difficulties to transform public policy statements into operational goals.

The above described evaluative approach by definition is not linked to any particular economic or social policy but based on the stated policies in a particular country for a particular sector or program at a particular time, a goal analysis must always be carried out. In fact it constitutes the very heart of the system.

The analysis of public goals - as seen from the evaluators point of view - can be divided into the following six major phases:

a) Describe the problem-area

b) Identify policy out-puts

c) Specify the goal elements

d) Structure the goal elements

e) Analyse of the linkages goals on different levels (Means and ends test)

f) Analyse conflicts between goals on the same level.

These six steps of the goal analysis, on which the following discussion will be based, can be illustrated as below:

A. Describe the problem area

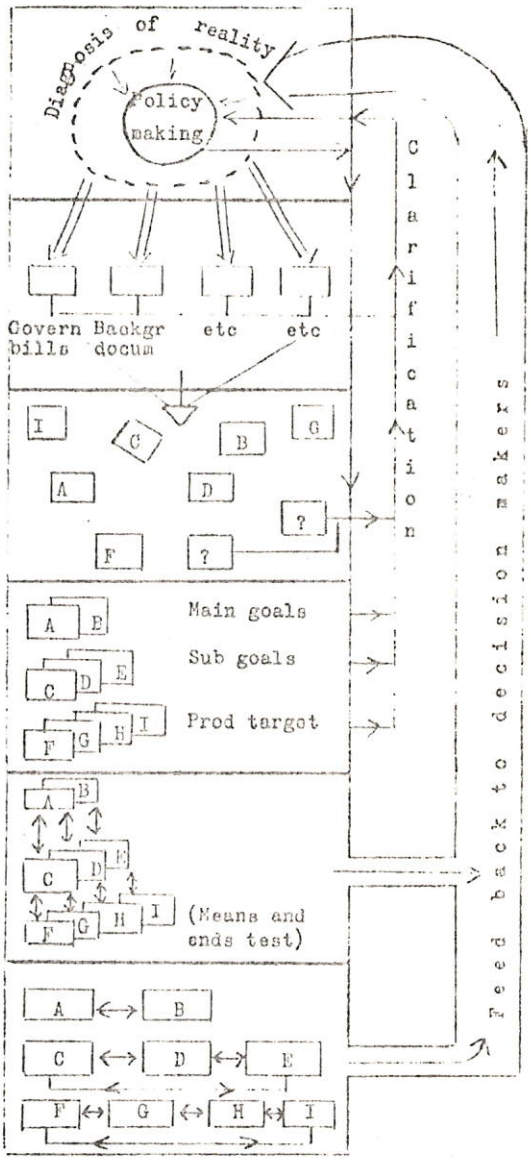
B. Identify policy out-puts

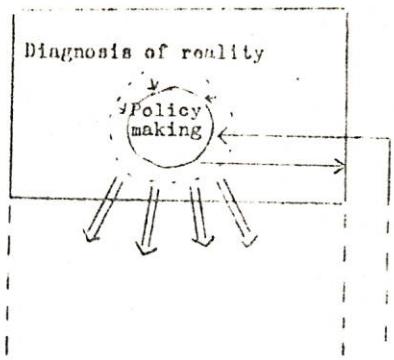
C. Specify the goal elements

D. Structure the goal elements

E. Analyse the linkages between goals on different levels

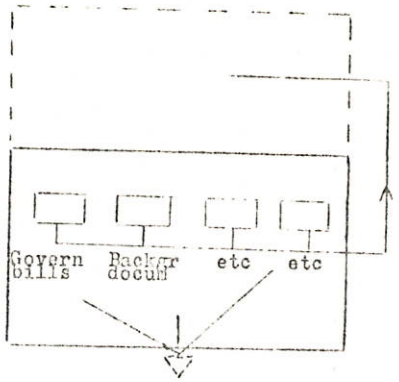
F. Analyse conflicts between goals on the same level





2.1. Description of the problem area

Policies are not formulated in a vacuum. They are - or should at least be - based on an assessment of the present situation. The achievements to be aimed at can then be indicated and transformed via e.g. a political process into policy out-puts e.g. annual and long term plans. An evaluator of e.g. educational programs should not directly be involved in policy making. His role is to utilize the policies stated in the analytical work in order to help the policy makers to acquire a better understanding of alternatives as judged against their own policy statement. The evaluator can, however, only play this role if he has some insights as regards the process of policy-making as such and knowledge about the structure of the educational sector and content of the educational plans. (See separate paper



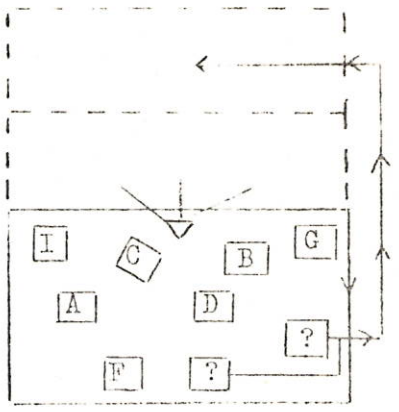
2.2 Identification of policy out-puts

Familiarity with the policy making system described above is necessary when the various policy out-puts are to be identified. These out-puts may be expressed in written documents or only verbally stated. Some may be explicit and clear policies, other rather vague. In many cases it will be next to impossible to find any policy guidelines at all except the fact that a decision is to be or already has been taken. But one thing is for sure: goals always exist as long as the purpose of a program or a project is to achieve something. It is this "something" that the evaluator must identify. As the structure of policy making varies between countries it is impossible to give any general indications as to where to look for policy out-puts in governmental bills, developing plans, committee background papers, plans of operations, legal documents, various protocolls, budget presentations etc etc. The only advice to be given is that the evaluator take the time needed to find out what exists and what does not. One may argue that it should be the policy makers' job to communicate their policies in such a form that the evaluator never had to search for the information needed. But as this study tries to face reality as it usually exists such a recommendation is seldom a solution to the problem to be solved.

Instead we will consider the quality and relevance of the policy out-puts in order to facilitate the next step of the goal analysis - the defining of the goal elements.

The quality of the policy out-puts only refer to how well they are defined which - of course - has nothing to do with the quality of the content.

The relevance of the policies must be determined with reference to the structure of the policy making institutions. The reason of course being that in any field of public activities there exist various opinions of what ought to be the policies to be followed. If funds are to be allocated within e.g. the educational sector various interest groups such as the teachers, pupils, parents, officials at the ministry of education, political parties, leaders at regional associations etc are interested to influence the decisions to be taken. The evaluator is of course not the one to judge what are to be considered good and bad policies - his task is to consider those policies that are formulated in accordance with the accepted policy making process of that particular country for this particular type of program. Neither is he to introduce his own political views into the analysis. This may seem selfevident but how many times have not analysts introduced theoretical models without recognizing the implicit policies then applied. It may sound more scientific to refer to Pareto optimality than to a vague governmental bill when analysing various expenditure patterns for education. In terms of relevance for the evaluation the simple truth is, however, that a policy formulated by the government in the country concerned (e.g. that the regional distribution of new schools should be considered) is far more relevant than the policy ideas of a prominent economist from Italy in the beginning of this century (which includes the idea that redistributional policies are not been considered).



2.3 Specification of goal elements

The relevant policy information identified is now to be transformed into what can be called goal elements, that is to say formulated in operational terms from the program evaluator's point of view. In the ideal case the policy makers may present their guidelines not in lengthy and vague statements but as precise goals. Usually, however, it is not only the task of the evaluator to identify policy out-puts but he must also specify the operational elements in these policy declarations.

A set of goals are usually considered operational if all the individual goals are measurable in relevant units and if the individual goals "form a logical and unambigious whole in such a way that they can be achieved simultaneously' [1] The strong emphasis on quantifiable units has often stimulated analysts to consider only those goals that can be expressed in operational terms and neglect goals that cannot be expressed numerically. To avoid this one may either stress that both operational and non-operational goals should be included or widen the concept of operationality to include all goals that can be formulated in such a way that the goal fulfillment can be described either in quantitative or qualitative terms.

We are going to apply the second definition of operationality which then will include a quantitative, qualitative, distributional as well as an executional dimension.

The quantitative dimension

The basic meaning of operational being measurable it is obvious that the quantitative expressions of the goals are of central importance. The extent to which it is possible to quantify different types of goals and thus benefits are to be discussed in some detail below.

The qualitative dimension should be considered both as regards the qualitative aspects of the quantifiable units (e.g. the quantitative units "student examined can be qualitatively described in terms of minimum knowledge required to pass the exam) and for such aspects of the goal that cannot be quantified (e.g. description of what is meant by the goal "a more democratic society").

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[1] Eero Pitkänen, Sweden Journal of Economics 1970, p 207.

What is important is that the language used when describing the qualitative dimensions is as clear as possible. Only one interpretation should be possible. The socio-economic evaluator probably has a lot to learn from pedagogical research in this respect with its taxonomies describing in a systematic manner the qualitative aspects of various educational goals. A major research task would be to replace the so called "neutral" check lists with similar taxonomies focusing various macro goals related to educational systems.

The following example shows a gradual specification of both quantitative and qualitative goal elements for a teacher training institute in Kenya [1]:

The first tentative definition of the purpose runs as follows:

"The goal of the teacher training project is to remove the shortage of well-qualified teachers in a short time and at a low cost by producing a number of well-qualified teachers".

This is a rather general statement without any reference to the Kenyan situation which also lack a time dimension.

Policy out-puts presented in the project documents enables the analyst to formulate the following:

"The goal of the Kenya Science Teachers College (KSTC) is to contribute to the removal of the shortage of Kenyan S1 science teachers in a short time and at a low cost by 1968 producing 44, by 1969 47, by 1970 98, by 1971 128 and from 1972 onwards 144 well-qualified Kenyan S1 science teachers given a three-year course".

The qualitative goal element "well qualified S1 science teacher" is then specified and the definition of quantitative and qualitative goals for the KSTC project would then be as follows:

"The goal of the KSTC project is to contribute to the removal of the shortage of Kenyan S1 science teachers in a short time and at a low cost, by 1968 producing 44, by 1969 47, by 1970 98, by 1971 128, and from 1972 onwards 144 well-qualified S1 science teachers given a three-year training, out of whom the academically superior will qualify for university entrance and the rest, preferably all, will serve as S1 science teachers for such a time as there is a shortage of S1 science teachers in the country, trained so that they have academically reached a standard equivalent to Higher School Certificate in their two major subjects, that they have a broad basis of scientific knowledge, that they have achieved skills in, positive attitudes to, and knowledge of progressive teaching methods, that they will be able to function as innovators of these progressive teaching methods with respect to their pupils and teacher

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[1] Presented in a study by Olga Linné: "A sociological-pedagogical evaluation of Kenya Science Teachers College, Uppsala 1970, p 23-27.

colleagues and that they have a good knowledge of social and economic conditions in their country so that they are able to serve as well-informed opinion leaders in their own local communities".

(It should be noted that this definition is not an official explicitly stated system of quantitative and qualitative project goals but rather has been developed from interviews with the College staff and from documents available at KSTC in Nairobi).

The difference in evaluative power of the last as compared with the first specification of goal elements is obvious both as regards the quantitative and the qualitative dimensions. The relevant questions to be considered in an ex-post analysis is thus automatically given in the latter goal formulation and include e g

"To what extent does the KSTC project fulfill the goal of an annual out put of by 1968 44, y 1969 47 etc".

"To what extent and for how long will the S1 science teachers graduated from KSTC stay in the teaching profession".

"Does the KSTC project change the students attitudes toward more progressive teaching methods".

It may be interesting to recall at this point the difference between an evaluation - based on specifications of relevant goal elements - and traditional market based internal rate of return evaluations based on income generated. In an ex-post evaluation it would be considered a failure if the trained teacher never became a teacher but accepted jobs in foreign private firms operating in the capital. With the latter method this may be considered a success if the private enterprises paid a higher salary than the government could offer science teachers.

The distributive dimension covers both distribution over time and distribution between various target groups. We will limit the presentation of this dimension to the distribution over time and between groups.

The distribution over time can be described by a starting point (base-line), various check points during implementation and a specified time when the final goals are to be achieved.

The base lines serve the dual purpose of informing the decision maker about the present situation and thus improve the base for decisions as well as they enable the manager to follow the goal variables over time as from the time before the program was implemented.

The check points are particularly important for the management power of the goal. A goal stating that 1 000 teachers should be trained within a ten year period is not operational until the yearly out-put of teachers trained is specified. This can easily be understood when realizing the differences in implementing the following two different out-put series (Alt 1: 10 x 100; Alt 2: 5 x 20 + 5 x 180).

The evaluative power of the time dimension of a goal is selfevident. No one would consider it irrelevant if the 1 000 teachers were trained during a 5, 10 or 25 year period.

In spite of the obvious and absolutely crucial time dimensions base lines and check points are often missing and some educational policies are even lacking any reference to time. A goal without the time dimension can never be considered operational.

The distribution between various groups (e g classified in terms of income, age, sex, or geographical location) is equally important but in spite of this often neglected in most public goal formulations. Just as goals always exist - at least in an ex-post sense - so do target groups. When known such distributional goals are usually either very vaguely formulated (equality is important) or belong to the implicit goals that fall into contradictionary pieces if expressed explicitly. Another reason for the lack of distributional descriptions between groups is that the present situation is not known and thus the light of explicity will only reveal a lack of knowledge. Finally an often heard argument for not focusing on the distribution between groups when appraising public programmes is that taxes and other "distributional" policies take care of these aspects.

Any practical knowledge about reality will however indicate that the distributional effects of certain public investments neither can (due to its permanent character) - nor will (due to lack of political power) be directly linked with other redistributional efforts.

How can, for example, a farmer on the countryside be compensated for a government policy not to consider the distributional effects of such public services as education or health? Through a general redistributional policy of progressive taxation? Surely not. Consequently the specific target groups for a public investment must always be identified in a goal analysis.

The executional dimension

The concept operational goal implies, as described above, that the goal can be used as an allocative, management and evaluative tool. The executional dimension of the goal describes the extent to which the goal in reality will be related to the allocative decisions to be taken, the management process and the evaluation work to be carried out.

Many political goals are expressions of compromises and which may be the most practical way to avoid political conflicts. The goals then formulated may have no "steering power" as regards the development on lower levels.

In these cases the technique of "revealed preferences" can be useful in checking to what extent the decisions actually taken are in line with the policy statements made, that is to make a crude but still distinction between what can be considered real and imaginary goals respectively.

2.3.1 Benefit measures actually applied when evaluating educational programs.

The identification of the benefits for a certain project is the same as the description of the content of its operationally defined objectives and goals. In spite of this it may be interesting to indicate some benefitmeasures as they actually have been used in various analyses in order to exemplify the possibilities and limitations to express progress data in quantitative and qualitative terms, are these measures of course only to be regarded as examples of potential benefits.

1) The principal measure of productivity is the increased earnings due to higher education as isolated - as far as possible - from income effects determined by native ability, family background, social class origin, work experiences etc.

Even if we could isolate these factors and all the relevant statistics were available, it can be questioned whether - from society's point of view - income levels and productivity levels were strongly correlated.

From the individual's point of view the earning as such is of course the criterian of better opportunities and possible rise in level of living regardless of the productivity effect of the job performed.

When calculating the productivity/income effects of education the actual rate of employment must be estimated (based on manpower plans) and not school enrollment figures, drop out rates, un- and underemployment must be included in the analysis.

2) Consumption benefits from education (the pleasure during and after education) is hard to measure and therefore often excluded.

3) Social educational benefits include - greater flexibility and thus adaptability in a changing society due to education (greater security).

- higher status and - perhaps - more "wanted" type of jobs

- lower birthrates are often associated with education as well as improved health (due to better hygiene).

4) Indirect benefits

- other persons earn more due to the education of some e.g. employers, sub-ordinates, families. (mothers can go out to work when the children are in school).

- less social cost for the public in the field of police protection, social welfare, etc. (mainly relevant in urban areas in industrialized societies).

5) Institution building effects

- development of an institutional structure adopting and forwarding attitudinal changes with positive effects on the development process.

- the maturity and quality of the teaching institutions can be measured (e.g. by assessing the quality of the inputs).

6) Political benefits

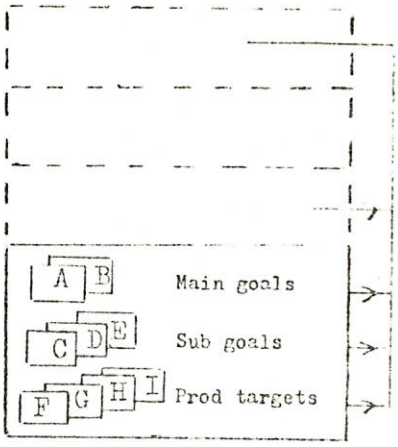
- the importance of a literate electorate

- forging a national culture and in many cases a common language

- modernized out-look both as regards those educated and their relatives (e.g. parents) and friends.

7) Distributional benefits

Education can bring about equality in opportunities and the distributional benefits of providing education to those under the poverty line are an extremely important policy measure to decrease the gap between poor and rich. It should, however, be recognized that the place of residence after completed school rather than the location of the school is most important. A theoretical elementary education in a rural setting may just increase the unwanted urbanization and thus unimployment in the cities and be of no or negative effect for the communities where the school was located.

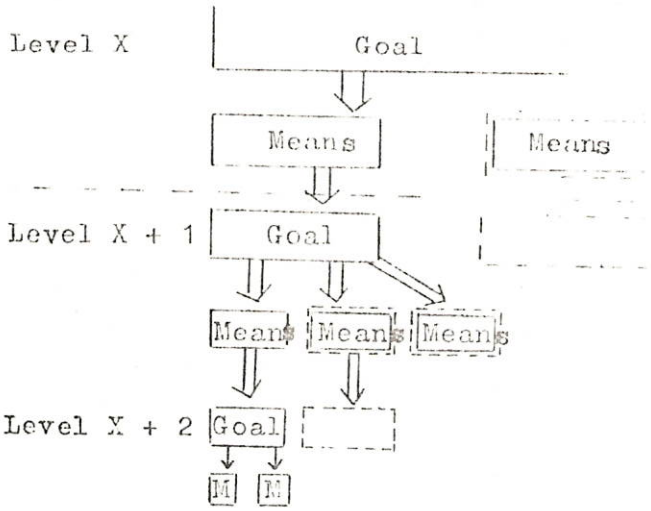


2.4 Structuring the goal elements

The goal hierarchy

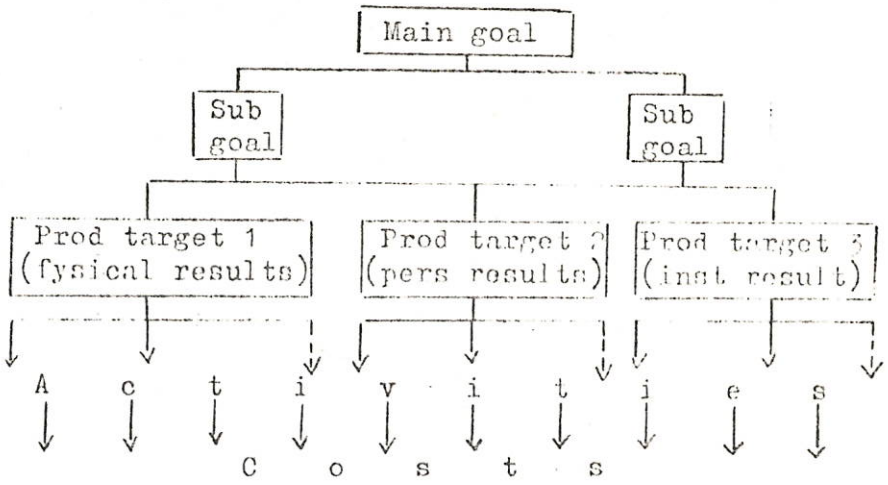
We have now reached the stage in the goal analysis where the relevant policies have been transformed into goal elements which are as operational as possible. The next step is to relate these goal elements to various policy levels, that is to say identify how ends and means are related to each other. This can be done by constructing a goal hierarchy.

A goal hierarchy - or a means and ends chain as it is also called - can have any number of levels and is charachterized by the fact that ends on one level becomes means on another. (See the figure below)



For practical purposes we will use a four level model. These four levels are usually sufficient when analyzing a public programme and can be referred to as main goals, sub-goals, production targets and activities.

The goal hierarchy can then be presented as follows:

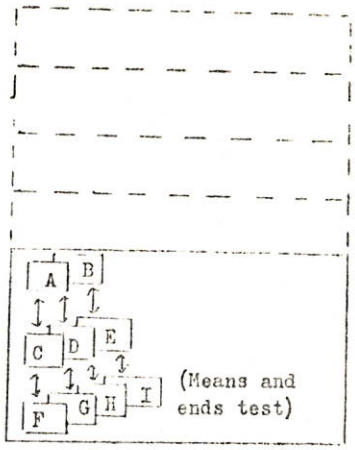


In constructing such a goal hierarchy both the "top-down" and "bottom-up" approach must be used depending on the extent to which the alternatives are a priori given. Again it is worth to underline that the fact that the evaluator has to try to structure various goal elements into a goal hierarchy should not reduce - but stimulate - the policy makers to do the same before the policy statements are formulated. This would be a most effective way of directly improving the consistency and clarity of almost all policy statements and stop the present presentation of isolated policy elements on various levels.

Assume for example that the policy makers formulating the main goal for foreign aid in an expenditure figure (e.g. 1% GNP) had tried to formulate some production targets. When realizing that spending - regardless of use - hardly constituted any base for allocation decisions this main goal had probably been expressed as a resource base related to some main more meaningful goals if one did not accept the fact that e.g. 10 000 monetary units (MU) spent on a Rolls Royce automatically are ten times better than 1 000 MU spent on educational material.

This example may seem to be out of touch with reality "as no politicians act without considering the use of the money". But when realizing that most public policies are expressed not in benefit but expenditure terms (X MU to the educational sector instead of stating the main benefits to be achieved through an expenditure of X MU) the above example is neither irrelevant nor an undue oversimplification.

The goal hierarchy also enables us to apply the central concepts of significance and productivity described above. Planned and real significance is then related to main- and sub-goals while the numerators for planned and real productivity are to be found on the production (out-put) level.



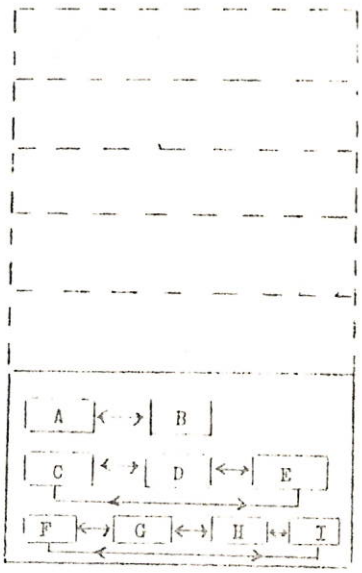
2.5. Analysis of linkages between goals on different levels

The logic of the goal hierarchy, which implies that the various goal elements are "sorted in" on the appropriate levels, must be integrated with an analysis as regards the linkages between the different levels. This is usually called an ends and means or a means and ends test depending on whether the "top down" or "bottom up" approach is used.

One way to understand and describe these linkages is to look upon the various goal levels as separate subsystems and then try to see how these systems are linked to each other. Assume that we are to carry out an ex-post means and end test. The starting point would be the in-put system specifying what in-puts (in terms of e.g. money, manpower, goods and services) actually had been provided. The linkage between the in-put system and the project system is revealed through questions such as: Was the money used in accordance to the plans? Could the manpower resources be utilized? To what extent were the goods and services provided succesfully absorbed by the project system? What in-puts were missing (lack of linkages)? The project system then transforms these in-puts via various activities to outputs. The linkages between activities and certain production results is of course of extreme importance and is usually a problem to be studied by a subject matter specialist.

The relationships between the project system and the subsector to which the project belongs is of crucial importance.

To consider only production and productivity has in many cases simply implied that the wrong out-puts have been produced more effectively (improved teacher training for the wrong types of teachers, increased production of products without a market etc). In other instances isolated productivity analysis have stimulated the decision makers to try to maximate a certain type of production without relating it to other related project systems and higher ends. A positive effect of stressing the relationships between means and ends is also that the subject matter specialists have to relate their knowledge and recommendations to a wider and more dynamic context instead of limiting their views t e.g. the project system. If this type of communitation is improved the risk of the "white elephant" projects is reduced and every subject matter specialist has to come out of his professional jargon in order to relate his job to the others'in order to achieve a common end.



2.6 Analysis of conflicts between goals on the same level

"The government of any society may be viewed as composed of many competing individuals with conflicting goals".[1] The last part of the goal analysis will focus on the understanding and formulation of these conflicting goals. The whole process of resource allocation can of course be considered in terms of various goal conflicts as more resources to one programme result in less for another. The more limited scope of this analysis is to discuss some possibilities and constraints in order to determine relevant trade-offs between e g stated production targets or sub-goals in order to create a base for the further analysis of the resourse allocation problem. This is to be considered an alternative to the present trend to neglect existing goal conflicts at the policy level and only consider one goal at a time.

In terms of political slogans the goals for education, health and improved communications may then be formulated separately in very general terms. Expressions such as integrated, unified, or balanced approaches may however give the public an impression of a consistent whole. From the programme analysts' point of view such goals resemble more of a wishing list than a base for any allocation decision.

What is for example the meaning of "balanced regional development in tne field of educational facilities". Is it to be interpreted as if the differences between rich and poor regions in a country should be reduced (balance = equality) or remain unchanged on a higher level (balanced = present distributional pattern).

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1) Alessi J. "Implications of Property Rights for Government Investment Choices". The American Economic Review March 1969

A simple systems approach can also when analyzing relationships between goals on the same level be preferred to a static expression of a single goal as it helps the policy maker and evaluator to understand the dynamics of the various goals.

A major task for the evaluator is to identify inconsistencie within the goal structure and by making them explicit hopefully improve the technical quality of the goal either by stimulating policymakers to reveal their preferences or by structuring the available goal information in a systematic way.

Not until these steps in the goal analysis are carried out can the identification, enumeration and valuation of relevant benefit expressions of a particular educational program be focused and an ex-post evaluation - from society's point of view - be useful for policy makers and managers.