

of both benefits and costs in monetary terms to assist comparability in decision-making. (1) Some local government officials have claimed that cost-benefit analysis is merely a new name for the comprehensive reports on projects which are submitted to City Councils and which have in the past formed the basis of decision-making. Yet seldom have benefits been quantified in these reports. It is the crux of cost-benefit analysis that both costs and benefits are set out in monetary terms. It requires the recruitment of qualified analysts, and this has been a factor in limiting its use to the type of major project mentioned above.

There is one other technique, however, which is being increasingly used in local government, namely, the cost effectiveness study. This differs from cost-benefit analysis in that 'the inputs have been priced but the outputs have not'. (2) As an example, assume that at a cost of one million rand one cancer clinic can be operated which will prevent one hundred deaths, and at a cost of five million rand five clinics can be operated which will prevent four hundred and fifty deaths. A cost effectiveness statement would thus be represented as follows: (3)

<u>Cost (R)</u>	<u>Effectiveness</u> (deaths prevented in an average year)
1 000 000	100
5 000 000	450

1. N.J. Kavanagh, Economics of Water Supply and Cost Benefit Analysis, I.M.T.A. Conference Paper 1968, p. 16.

2. Harold A. Hovey, The Planning-Programming-Budgeting Approach to Government Decision-making 1970, p. 45.

3. *ibid.* pp. 45-6.

While the first impression that may be gained from the above representation is one of over-simplification, it should be realised that the demands for analysis in programme budgeting have been for information more along these lines than the normally unattainable expression of benefits in monetary terms. Broad indicators of output in social services are now a common feature in programme budgeting. The use of these together with 'issue papers' and 'programme memoranda', both of which are substitutes for in-depth analysis, have become an acceptable form of analysis both for a consideration of alternative programmes and the furnishing of data for long-term financial and output plans. Issue analysis is merely a discipline which ensures that all relevant factors are considered in perspective and it is commonly used by local authorities when introducing programme budgeting systems. It was used by the management consultants appointed to introduce programme budgeting systems in Liverpool. ⁽¹⁾ A vital factor in this modified form of analysis is the measurement of output, a subject which will now be considered in some detail.

5 The Measurement of Output

In the course of this study numerous references have been made to inputs and outputs. Inputs are resources of finance, manpower, goods and services expressed in monetary terms. Outputs are the results achieved by programmes, and need not be expressed purely in monetary terms.

The analysis of programmes is undertaken in order to

1. Letter from City Treasurer of Liverpool, 8th September 1970; See also George Washington University, PPB Note 11: A First Step to Analysis - The Issue Paper.

test their contribution as well as the contributions of alternative programmes to the fulfilment of major objectives. Yet the generation of alternative courses of action by themselves is insufficient. It is necessary to have a measure of the effectiveness of a programme in meeting a major objective. Although measures of various kinds are employed in the general course of analysis described above, indicators of effectiveness are also used as part of multi-year output and financial plans as will be observed in the following chapter. It is considered better, however, to cover the subject of output measures in this chapter which deals with analysis rather than under multi-year planning.

In the sphere of industry the measurement of output is not difficult because definite commodities like shoes, stoves and motor-cars are produced. The differences between private goods and public goods were discussed in Chapter III and it is a subject very pertinent to the development of output measures. Reference has also been made above to a spectrum of analysis, ranging from the easily measurable activities at the lower levels of the programme hierarchy, to the broad objectives at the higher level where quantification is not only difficult but held by several authorities to be undesirable. (1)

The measurement of output is not new in the sphere

1. See for instance A. Wildavsky in (a) 'The Self Evaluating Organisation', I.M.T.A. - U.K. Programme Budgeting Implementation - Some Practical Problems, pp. 60-1. (b) 'The Political Economy of Efficiency, Cost Benefit Analysis, Systems Analysis and Programme Budgeting', Lyden and Miller, op. cit. p. 382.

of local government, nor is the use of output measures in association with budgetary formats. This was observed in the development of performance budgeting in the nineteen fifties. (1) Considerable interest has been aroused in output measures in recent years as a means of assisting decision-makers, rather than in the narrower field of measuring efficiency. This movement represents an extension of the use of unit costs beyond the field of cost accounting, and into the sphere of general management. Work-study is today employed not only with a view to increasing the efficiency of public services but also to provide information on the manner in which objectives are being achieved.

In recent years valuable work has been accomplished in establishing output measures for use in programme budgeting systems. In Great Britain, for instance, useful studies have been undertaken by the Home Office, the Department of Education and Science and the Gloucestershire County Council in developing output measures as part of programme or output budgeting. (2) In the U.S.A., where programme budgeting has advanced further than in other countries, much has been done in developing output meas-

1. See Chapter V, Section 2; John H. Dwyer, Yardsticks for Performance; George A. Terhune, op. cit.; Municipal Finance Officers Association, Performance Budgeting for Libraries.

2. G.J. Wasserman, 'Planning Programming Budgeting in the Police Service in England and Wales, O and M Bulletin, May 1970, pp. 197-207; Reports to the Gloucestershire County Council on PPBS Feasibility 1971; United Kingdom, Output Budgeting for the Department of Education and Science, op. cit. p. 19.

asures. (1) In South Africa the slower development of programme budgeting has tended to retard the use of output measures in spheres other than accounting, but several writers have urged the use of output data with annual budgets. (2)

Before considering some of the output measures which could be used in determining the effectiveness of programmes, brief reference will again be made to the major allocative decisions which have to be made at the top of the decision-making hierarchy, e.g. Should more resources be employed on transportation and less on health? The analytical aids which have so far been mentioned are of little use in this sphere where 'intuition and judgment are paramount'. (3) There are many problems in finding an optimum allocation and reference has already been made to the problems in this regard when dealing with theories of social choice. (4) The output measures which will be considered here have relevance mainly in programmes and activities at lower levels. The lower the level in the

1. The references are too numerous to quote, but see in particular George Washington University, PPB Note 7: Output Measures for a multi-year programme and financial Plan.

2. J.J.N. Cloete, 'Budgetary Practices for Local Authorities', I.M.T.A. Conference Proceedings 1964, p. 94; P.W. Hoek, 'n Rigsnoer om Lopende Koste van Munisipaliteite te hersien en beheer', The South African Treasurer, June 1958, p. 120; A.R.J. Cross, 'Die Beheer van Koste deur Funksionele Indeling en Begrotingstechnieke', Paper to Summer School, University of Pretoria, 1959.

3. Gene H. Fisher, 'The Role of Cost-Utility Analysis in Programme Budgeting', Programme Budgeting, David Novick, op. cit. p. 63.

4. See Chapter III.

programme structure, the more easily can quantification be undertaken. Output measures become more meaningful. They are sometimes referred to as 'intermediate measures' to distinguish them from the ultimate measures at the top. (1) Simon distinguishes between final goals where value judgments predominate, and mediate goals where factual judgments predominate. (2)

In the traffic model given in the preceding chapter, the ascent from firm measures to nebulous measures can be seen. One activity at the lowest level was the testing of vehicles. The contribution of this activity to the programme of 'ensuring vehicle roadworthiness' can be measured by the total number of vehicles tested per annum, the number of vehicles passed as roadworthy, the number rejected, and the number of random tests conducted on highways. At the next higher level a determination must be made of the contribution which the programme - 'ensuring vehicle roadworthiness' - makes towards the intermediary objective - 'traffic control'. Here, a different type of measure is needed, such as the number of accidents arising from vehicles not roadworthy, or the number of road blockages caused by breakdowns. At the next higher level, a measure is required for ascertaining the contribution which 'traffic control' makes to the next higher intermediary objective - 'movement of traffic on highways'. At this stage less definite measures of effectiveness will

1. United Kingdom, Output Budgeting for the Department of Education and Science, Appendix II, passim.

2. Herbert A. Simon, op. cit. pp. 4-5.

enter the picture, and a measure is now needed which must virtually determine the extent to which the traffic department in its entirety facilitates vehicular mobility. One measure suggested is the reduction in the number of accidents per year, or the number of fatal accidents, yet these are not logical measures of effectiveness.

Furthermore, the effectiveness of traffic control would have to be weighed against the effectiveness of the other important intermediary objective at this level e.g. 'Construction and Maintenance of Highways'. At this higher level, the kilometers of roads constructed in a year are not important; such a measure is significant only in lower level programmes. What is required is a measure for ascertaining the effectiveness of the roads network as a whole in promoting the free movement of traffic. This is a good illustration of the output problem in budgetary decision-making. Should a local authority commit more resources to improving its road networks, and less on traffic control measures, or vice versa? How does one measure their relative contributions to the fulfilment of a major objective? One measure of highways effectiveness is the journey-time saved by motorists in getting from point A to point B. One measure of traffic control effectiveness is the reduction in the number of accidents, or the time taken to clear peak traffic. None of these are definitive measures and they demand intensive investigation. Nevertheless, they could still be satisfactory general indicators of the extent to which intermediary programmes contribute towards fulfilling the ultimate objective of transportation in a city, namely 'the movement

of persons and goods within the municipal area as quickly, safely and efficiently as possible'. (1) Many local authorities do not even attempt to quantify measures at the top; they either use no measures at all, or repeat the measures used at lower programme levels. (2)

An important question arises out of the search for measures of effectiveness. Is effectiveness the same as efficiency? The employee conducting roadworthy tests on vehicles may be performing his task efficiently, but the overall effect of his work in fulfilling higher needs may fall short of the contribution which other activities could make towards traffic control. A municipal department may be efficient in pursuing the wrong ends, and it may be inefficient in pursuing the right ends. An activity or programme can only be evaluated relatively - relative to a common purpose, and relative to available resources. This is basic to any economic theory of budgeting. In the sphere of local government particularly, a major factor in the ends-means relationship is the limitation of resources. Another is the number of legislative constraints which restrict freedom to choose certain means when desirable ends have been established. Simon and Ridley draw a distinction between 'adequacy' which is an absolute measure of results and 'efficiency' which is an accomplishment relative to available resources i.e. the ratio of the effects actually obtained with the available resources to

1. See Chapter VIII, Section 4.

2. See for example City of Boston and County of Suffolk, 1971 Programme Budget, p. 329.

the maximum effects possible with the available resources. A good public library is not one which owns all the books published but one which has used the limited funds to build up as good a collection as possible under the circumstances. (1)

The problem of resource constraint is of considerable importance. The main reason for having to choose at the various levels in the programme structure is to be found in the fact that resources are not limitless. Optimal programmes for meeting chosen ends may be submitted by analysts - but if they fail to observe policy and resource constraints, their schemes may be valueless in the sphere of planning. An analyst in the public sector is obliged to suboptimise at the lower levels of the programme structure and must operate within policy constraints imposed at higher levels. (2)

The published works on output measurement in the public sector end frequently on a despairing note. They point out that the very nature of the services which are rendered in order to satisfy public wants defies quantification. How is it possible, for instance, to measure the effectiveness of health inspectors in promoting the general health of the community? There is also criticism of the practical application of output measures to the effect that some quantitative measures formally and expensively

1. Clarence E. Ridley and Herbert A. Simon, *op. cit.* p. 3.

2. Charles E. Schultze, *op. cit.* p. 96; Roland N. McKean, 'Criteria of Efficiency in Government Expenditures', Public Budgeting and Finance, Robert T. Golembiewski, *op. cit.* p. 516.

established are little used. (1) Furthermore, certain writers have pointed to the danger of a Gresham's Law of budgetary choices - those which can be sustained by quantifiable measures tend to drive out those which cannot, because the pressure of budget time-tables demands rapid decisions. Those propositions supported by adequate data would tend to receive preference over those which are less quantifiable, yet which may be original and laudable. (2)

In the sphere of the public services there is sufficient evidence to suggest that when measures are established as part of a programme budgeting system, great care should be taken in their choice and use. 'Mindless quantification', a term used by Wildavsky, should certainly be avoided at the higher levels of the programme structure. There is strong support for the view that the open market system of choice cannot be simulated in the satisfaction of social wants, where outputs are resistant to the forms of quantification found in the private sector of economy. (3)

In recent years, however, a new approach has been made in the use of output measures to sustain public budgetary choices. The genesis of this lies in the fusion of programming and budgeting. Decision-makers can easily be confused by a plethora of budgetary information. There

1. John M. Leavens, 'Measuring Budget Performance - Concepts', Municipal Finance, August 1960, p. 66.

2. R.W. Wallis, 'Management theory, decision-making and local government', Local Government Finance, September 1967, p. 334.

3. See in particular Frederick C. Mosher, 'Limitations and Problems of PPBS in the States', Public Administration Review, Vol. XXIX, 1969, p. 161.

is a human limitation to the facts that can be absorbed. The conceptual side of this problem of choice has already been discussed in Chapter III.

The proponents of the new method of using output measures agree that the application of complex analytical studies in routine budget-making has proved impractical, because the type of measure required for in-depth analysis must as far as possible be in quantitative terms and where possible in terms of money. The new approach, however, calls for a less rigorous method of measuring effectiveness in a process which combines budgeting and planning. Here, the decision-maker requires some 'ready-to-wear' type of measure; he obviously has no time to study a cost-benefit analysis for each choice. The need is clearly put by the U.K. Department of Education and Science thus:

The key to the objective assessment of performance is thus not necessarily quantification. The first step is the careful identification of objectives; the next is the identification of the type of evidence that is generally agreed to be an indicator of success. This evidence may or may not be quantitative; indeed, naive measurement can be harmful. For example, one of the indicators of success in basic research is the extent to which new discoveries are made, but it would be more illuminating to have expert judgments made about the importance of particular discoveries than to try and devise a numerical scale which in this instance would have no claim to objectivity. (1)

The implication of the above for public budgetary decision-making seems to be that the Lindblom proposition regarding the impracticability of a comprehensive study of all alternatives may be accepted, but at the same time the view may also be accepted that budgetary choices can be illumined

1. op. cit. p. 65.

by meaningful information of a general nature. Such information will not necessarily ensure rationality; even complex analysis may fail to do that. Yet it could assist in giving the decision-maker a general idea of effectiveness, and help to answer questions like, What are we trying to achieve? What are we getting for the financial resources we are committing?

General indicators of achievement have been evolved to illumine budgetary documents rather than as output measures associated with programme analysis. The State Local Finance project supports the use of ready indicators, which show what is being achieved for the expenditure provided in each programme category and its components, even if these are only crude measures of volume e.g. number of students enrolled. Such indicators may throw little light on the quality of education but they give some indication of programme size, of the changes that accompany changes in expenditure and of the prospective levels of expenditures, and they assist in highlighting areas which require close scrutiny. (1) They are also being used by local authorities even where there is no commitment to a programme budgeting system. (2)

These general criteria for evaluating effectiveness are foreign to the concept of performance measurement in terms of standard costs and budgetary formulation as practised in the sphere of private industry. Accurate measure-

1. George Washington University, op. cit.

2. P.B. Kershaw, 'Budgeting for Achievement', Local Government Finance, September 1973, p. 313.

ment is vital to business, for in no other way can a company ensure efficient operation and profitability. Administrators in the public sector do not have such clear output data. They must turn to the use of more general and even external data in order to measure achievement. These can be useful if used as guidelines, but dangerous if regarded as guarantees of rational choice. All information systems which assist management should be seen in this light - that they are subject to the same risks and uncertainties as the managerial decisions which are made. (1)

6 Conclusion

There has always been analysis of some kind. Whenever items on the annual estimates are queried and reports called for, some form of analysis takes place. Before a major item is placed on a capital programme ad hoc analysis on a complex scale may take place. Programme analysis as a component of a programme budgeting system has tended to be seen as an integral part of the budgetary process, rather than as an ad hoc study.

If analysis is too complex the time-demands of budgeting systems have proceeded without analysis for the reasons given above. Budget reformers have, therefore, turned to general measures of effectiveness which can be arrayed with financial data to give both officials and elected representatives at least some indication of achievement.

Yet even this type of measure will require adequate statistics and information systems. There is a wide field

1. J.E. Fisher, 'Management Information and Evaluation Criteria', O and M Bulletin, August 1971, p. 167.

for further research in providing an answer to the question, for instance, 'How well are we doing in transporting people'? Indicators of achievement at lower programme levels may convince officials that output is satisfactory - but Councillors, passengers and road users may have other views. There is, in fact, considerable scope in local government for the use of market research techniques. Any criterion of success in the public sector must not ignore the real world of the consumer.

CHAPTER XI : THE INTEGRATION OF PLANNING AND BUDGETING

The four major components of a programme budgeting system are briefly:

- (a) the identification of objectives
- (b) the determination of programmes and costs
- (c) programme analysis
- (d) the preparation of multi-year programme and financial plans. (1)

The first three were dealt with in the preceding chapters; the fourth is to be covered in this chapter. A widely recognised advantage of a programme budgeting system is the integration of planning and budgeting at all levels in the programme structure. It is also recognised that this advantage cannot be fully realised if the time-span of budgeting is limited to a period of one year. In the many references to budgeting in earlier chapters, the period of one year was assumed. The financial year is entrenched in accounting theory and practice, as it is in Provincial legislation in South Africa. (2) Budgetary practice fell into line with this traditional time-span, but attention has been given to longer-term budgeting

1. These components were described fully in Chapter VIII.

2. J.W. Cowden, Holmes Local Government Finance in South Africa, op. cit. pp. 374-5.

in the past two decades. (1) The new development in long-term budgeting will be considered in the sections that follow, and then compared with multi-year programme and financial plans, the final stage in the implementation of a programme budgeting system.

1 Developments in the Field of Financial and Economic Planning

Developments in the field of economic and financial planning during the past three decades received their main impetus from Keynesian economic theory in the nineteen thirties. The concept of a balanced annual budget gave way to a budget balanced over a number of years in a cycle. This was followed by theories of functional finance to which reference has already been made. (2) Public expenditure on national infra-structures was retarded during World War II, but it accelerated at a fast pace after the cessation of hostilities. The ideal of social security which emerged after the depression and war years, gave rise to substantial increases in social expenditure. In France, Sweden, United Kingdom and the United States of America, public spending as a percentage of gross domestic product varied between 30 per cent and 40 per cent in 1968, compared with 6 per cent and 10 per cent at the beginning of the century. The climate in the post-war years was thus favourable for financial and economic planning.

1. See for instance J.W. Cowden, *ibid.* Chapter XII; C.F. Nieuwoudt, 'Die Begroting as Beheermaatregel van die Stadsraad oor Plaaslike Administrasie', p. 7; J.C. Reynders, 'Die Begroting van Plaaslike Besture', The South African Treasurer, June 1962, p. 114.

2. See Chapter IV, Section 4, and Chapter V, Section 1.

The need for better control, management and planning of public spending, was highlighted in the U.S.A. by the two Hoover Commissions (1949, 1955), in the United Kingdom by the Plowden Committee (1961), in Canada by the Glassco Commission (1960), and in South Africa by the Franszen Commission (1970). (1) The long-term surveys now being conducted in these countries have as their main aim the integration of economic and physical planning.

Physical planning goes much further back in history than economic and financial planning. By its very nature, the creation of physical things demands close attention to future needs. The engineer must plan roads and bridges for tomorrow's traffic as well as today's, and the architect must plan buildings which will serve the needs of users for many years ahead. Long-term perspectives may require forward projections up to a hundred years. (2) One of the problems of integrating economic and physical planning has been the differential time horizons of physical plans and financial plans. Where no integration exists, planning becomes synonymous with the execution of a particular project and its time-span. (3) Where there is integration, some compromise must be reached regarding long-term planning periods. There are no fixed rules in the private sector as to how far ahead long-term planning should reach. A firm with no commitments beyond three

1. op. cit.

2. Juliusz Gorynski and Zygmunt Rybicki, *The Functional Metropolis and Systems of Government*, Metropolitan Problems 1970, p. 305.

3. S.F. Thirion, op. cit. p. 298.

months can plan for that period, a fashion firm may plan for a year, a forestry enterprise for ten years. (1)

In the public sector the most common time-span chosen for financial and economic long-term planning is five years. This is the period covered by Great Britain's and South Africa's economic development programmes, and by the multi-year financial plans in programme budgeting systems of various countries. Although the projection of both physical and financial data beyond five years is useful to planners, periods longer than this are seldom recommended because of the high cost of processing the additional data relative to its utility, the need to have a comprehensible plan for elected representatives rather than an unwieldy one and general distrust in forecasts beyond five years.

In the sphere of local government, the introduction of long-term surveys of expenditure and the integration of physical and financial planning has been slow. Where long-term plans have been produced, they have been confined mainly to the sphere of capital investment. In the U.S.A., for instance, capital programmes were introduced as a result of the serious financial state many local authorities have found themselves during the post-Depression years. There were large accumulated debts, the consequence of unplanned and over-ambitious public improvement programmes. This brought home to cities the need for coordination in planning and finance, and considerable local interest in the forward planning of public expenditure was generated. The retarding of capital expenditure

1. John Argenti, Corporate Planning 1968, p. 209.

during World War II intensified the need for long-term capital improvement programmes. (1) Two other contributory factors in the stimulus given to capital programming in the U.S.A. were:

- (a) the importance attached by investors in municipal bonds to the forward planning of capital improvements,
- (b) Federal legislation, which made forward planning a condition of certain grants-in-aid.

In Great Britain the Ministry of Health as far back as in 1934 required local authorities to prepare programmes of capital works for a period of five years. During and immediately after the Second World War this type of planning was greatly intensified. The gradual relaxation of economic control, however, led to a situation where the five-year capital programme ceased to serve its original purpose. The government stated that there was a tendency for local authorities to inflate their requirements. Other powers to control the capital formation of local authorities were just as effective and therefore long-term capital programmes were abandoned. (2) In the past two decades large local authorities have voluntarily prepared long-term capital programmes in the interest of good planning generally. This development has been stimulated considerably by the publication of the Mallaby, Maud and Bains Reports

1. Municipal Finance Officers' Association of the United States and Canada, Budgeting with Special Reference to Capital Budgeting, pp. 1-2.

2. J.W. Cowden, Holmes Local Government Finance in South Africa, op. cit. p. 289.

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