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ABSTRACT

The report proposes a conceptual framework for researching key issues relating to rural public facility policy affecting such services as fire protection, water systems, roads, wastewater treatment, hospitals, and others, and identifies important research needs in this area. Major components of the framework are sources of financing (private and governmental), production inputs (labor and capital from private and/or public sectors); and production functions providing intermediate outputs in the form of community delivery systems. A major category of research needs and opportunities concerns the relationship between the inputs and the public service outputs of interest to consumers. Other research needs concern the development of technology for providing services under conditions of sparse population, to isolated households, or in small communities; the development of alternative methods of delivering public services; and the effect of state and federal laws or restrictions on the presence/absence of services/facilities. Additional research is needed in conceptualizing and ensuring spillover benefits from public services, the effects of projected population growth/shifts on the aggregate amount of investment expenditure in various capital facilities, and data gaps in public finance problems. Criteria for establishing research priorities might include judgment of benefits and costs, political appeal, feasibility, and interest of researchers. (NEC)

United States Department of Agriculture

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Agriculture and Rural Economics Division

Research Needs for Rural Public Services

Frederick D. Stocker

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ABSTRACT

This report proposes a conceptual framework for researching key issues relating to rural public facility policy affecting such services as fire protection, water systems, roads, wastewater treatment, hospitals, and others. Information needs are cited which require data collection and research.

Keywords: Public facilities, public services, rural development, rural communities, infrastructure.

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BACKGROUND AND PURPOSE

This paper proposes a conceptual framework for researching key issues regarding rural public facility policy and identifies the important research needs in this area.

In 1978, the U.S. Department of Agriculture (USDA) initiated a national survey of small towns and rural communities to determine the availability and condition of selected community facilities. This study, the National Rural Community Facilities Assessment Study (NRCFAS), completed in 1983, provided a rich data base for research, making possible explorations on subjects heretofore out of range.

The study involved a survey of 520 communities in the 48 contiguous States. The initial intention was to inventory 53 different types of facilities. But the scope was subsequently narrowed to focus on only fire protection, public water systems, and general community information on local roads, intercity transportation, and a variety of other facilities and background information on the communities themselves. Data on wastewater treatment, hospitals, and nursing homes were assembled from secondary sources for the sample communities.1/

Researchers, armed with this survey, may now consider the theoretical and public policy questions to which such data may be relevant and the still unmet data requirements for further extension of research on the adequacy of rural community facilities and services.

RESEARCH DRAWING ON THE NRCFAS DATA BASE

The first section of this report addresses possible research topics drawing directly on the NRCFAS data base or involving expansions of the data base.

The NRCFAS data base, essentially descriptive, profiles the availability and condition of public facilities in rural areas as of 1980. It serves also as a benchmark against which future profiles of a similar nature can be compared.

The basic problem that gave impetus to carrying out the NRCFAS study in the first place, that is, the widespread concern over the condition of the Nation's public infrastructure, remains of fundamental concern. This survey, whatever its limitations, is one of the few sources of firm data on the extent and severity of the problem. Public policymakers could use more and better data of this sort. USDA, having gained experience with this study, is well situated to provide guidance and to be a key participant in building and extending this data base and making it even more useful to researchers.

One valuable contribution that USDA researchers can make lies in refining the definitions and concepts that undergird any data base. The NRCFAS survey, in exploring uncharted territory, has identified and clarified some of these definitional problems. I hope that the existence of these problems, and the resulting deficiencies in the survey results (that is, the lack of a clear policy focus and a clear theoretical rationale), will not discourage further efforts along the same line, but will stimulate efforts to confront and solve them.

The data can be enriched, and their value greatly increased, by periodic replication of essentially the same information. Many important questions concerning the Nation's infrastructure relate not so much to the point-in-time snapshot view of the world as to the change. Perhaps the most obvious, and surely one of the most important, questions concerns the rate at which infrastructure may be deteriorating, and the related question of whether new construction is keeping pace with expanding population and rising demands for public services and facilities. Linkage of future surveys with the local government sample employed by the Census of Governments might provide economies of scale and perhaps enrich the usefulness of the data.

It is always essential in any proposed data gathering operation to weigh potential benefits (in the form of better informed policy decisions, more efficient resource use, or improved living standards) against costs. Weighing is especially important in this case, in view of the substantial cost involved and, as discussed later, the lack of a conceptual framework for making best use of the data.

Finally, the NRCFAS data might usefully be employed in a limited number of micro-level studies, involving a close look at a few of the communities in the sample. The purpose would be primarily heuristic, seeking insights into what additional information about the community, its public services, facilities, economy, population, and fiscal situation would be useful in clarifying the problems, linkages, and policy options. For example, it might turn out that community facility investment decisions result from such things as keen interests on the part of a single influential citizen, or firm; promulgation of State or Federal standards; interlocal rivalry; or a community's ambitious growth plans, to name a few. Likewise, it may turn out that investment plans are often blocked by opposition from a few key citizens or firms; the community's reluctance to borrow; ignorance of the technology involved; or ignorance of financing options. Such studies might also aid development of clearer concepts and definitions, as well as survey instrument design.

THE LARGER RESEARCH CONTEXT

We need to place this data base as it now stands, or as it may be enlarged on, in proper logical relation to the research program of USDA and the larger body of research on public services, facilities, and finance. We should think through and define the logical link to ongoing streams of research on such areas as the quality of life in rural areas; agricultural productivity; nonagricultural production and economic development in rural communities and regions; government services and service delivery systems; financing of public services and facilities and the Federal role in financing such facilities; the political economy of local capital expenditure decisions (for example, the extent to which business-oriented groups dominate local decisionmaking); and perhaps many other lines of research to which information on the availability and condition of local public facilities may be relevant.

In each of these research areas, the logical approach calls for, first, identification of the problem; second, the development from the existing body of knowledge of some theory or hypothesis that plausibly may shed light on the problem; third, identification of the data needed to test the hypothesis or theory; and, finally, the usual steps involving testing, revising, and refining the hypothesis and applying the results. (The last of these four steps is not particularly relevant to the present discussion.)

Generation of the NRCFAS data base seems to have preceded full development of either steps (1) or (2) above. There was no prior identification of a problem, except in the very general sense that the Nation's infrastructure, presumably including that of rural areas, is deteriorating and perhaps requires massive and costly rebuilding.2/ One must logically ask what the problem is (such as, a problem of poor health, traceable perhaps to inadequate treatment of wastewater); whether the problem calls for governmental action; and whether such action, if warranted, falls within the proper realm of Federal, State, or local government.

Nor is there any explicit theory linking community facilities to the problem and indicating why and how understanding of the problem, and insights into how to solve it, would benefit from data on the present availability and condition of community facilities.

The top research priority, therefore, seems to fall in the area of conceptualization, rather than data gathering or empirical testing. It seems to call for backing up two steps, trying to define more precisely what the problem focus is, then spelling out a theoretical model in which solutions to the problem are related to the quality and quantity of community facilities, and of course to other variables.

This paper now proceeds to identify problems and researchable questions to which data on community facilities might usefully be related. Not much is said on specific theoretical models, or how the data under consideration might be employed in such models. Development of the theoretical models would be a major part of the research visualized here. Moreover, if one starts by trying to identify problems that need research, it becomes apparent that there are major data needs other than NRCFAS. Little is said here as to exactly what these data may be, or how one might obtain them.

CONCEPTUAL FRAMEWORK

The framework employed in this paper for organizing thinking about rural community facilities is rather broad. It attempts to place public facilities in their proper perspective as some of the economic inputs needed to produce some of the goods and services that meet economic wants of producers and consumers. The framework, therefore, seeks to cover just about all the angles from which one might perceive an interest on the part of public policymakers in community facilities.3/

The fundamental reason for government policymakers to be interested in local community facilities lies in the contribution these facilities make to public services. Facilities have no intrinsic value or interest. Their adequacy or inadequacy derive from the need for the services they help to produce, and from the contribution that capital facilities, in conjunction with labor, make to the production of these services. It is easy to believe that construction of facilities contributes directly to economic growth independently of public service output. This is surely mistaken, for construction of a useless facility cannot improve a community's development prospects. Only as the facility contributes to public service output, and thereby to either private production or consumption, is there any growth effect. It may, however, have interesting redistributional effects, enriching some property owners and some workers, while imposing losses on others.

Of course, investments in roads, water and sewer systems, hospitals, and health facilities are significant for the jobs and income they generate in local communities. In the world of politics, one cannot ignore the impulse to job-creating expenditures and to production of tangible, visible public capital facilities. The political system places inordinate importance on such activities as obtaining loans or grants, awarding contracts, laying cornerstones, cutting ribbons, and turning on switches or spigots. A broader policy framework, in which personal and partisan political goals are seen as legitimate aims of public policy, would perhaps attribute more intrinsic importance to investment in facilities. At the very least, it is essential to recognize that these powerful political impulses exist and may influence policy decisions in ways that make no economic sense. But attempts to think in economic terms about the significance of such activities should keep attention focused on the output, service, and benefit provided by these facilities, rather than on the economic rents their construction generates for some members of the community.

In attempting to conceptualize public service output, we distinguish the proximate output (truckloads of solid waste picked up, number of fire truck runs, number of crimes investigated) from the more fundamental concept of output, consisting of the degree of attainment of consumer goals (clean streets, protection from fires, safety of persons and property).4/

Attainment of ultimate goals is the fundamental policy concern. Output of services is significant only to the degree that it contributes to attainment of these goals, and interest in facilities centers on the contribution they make to output and availability of important services to rural people. One of the central research questions must, therefore, be to identify and characterize the role of public facilities in production functions for public goods and services.5/

Public services in turn can be classified economically, according to their function, as either producer goods or consumer goods.6/ Some public services enter directly into consumers' welfare functions, directly affecting their material well-being. Examples would be good water supply and a good sanitary sewer system, both of which directly affect health, comfort, and quality of life. Or, services can be in the nature of producer goods, reducing production costs or adding to the quantity and quality of potential output, either agricultural or nonagricultural. The same public service, of course, can be both a producer good and a consumer good, depending on the nature of the use. Clean water, for example, is an important production input in many industries, as well as being an essential consumer good. The distinction between consumer and producer goods suggests that any evaluation of the need for or adequacy of a public facility should consider both its contribution to the quality of life of residents of the community and its significance as a production input.

FUNDAMENTAL CONCERNS

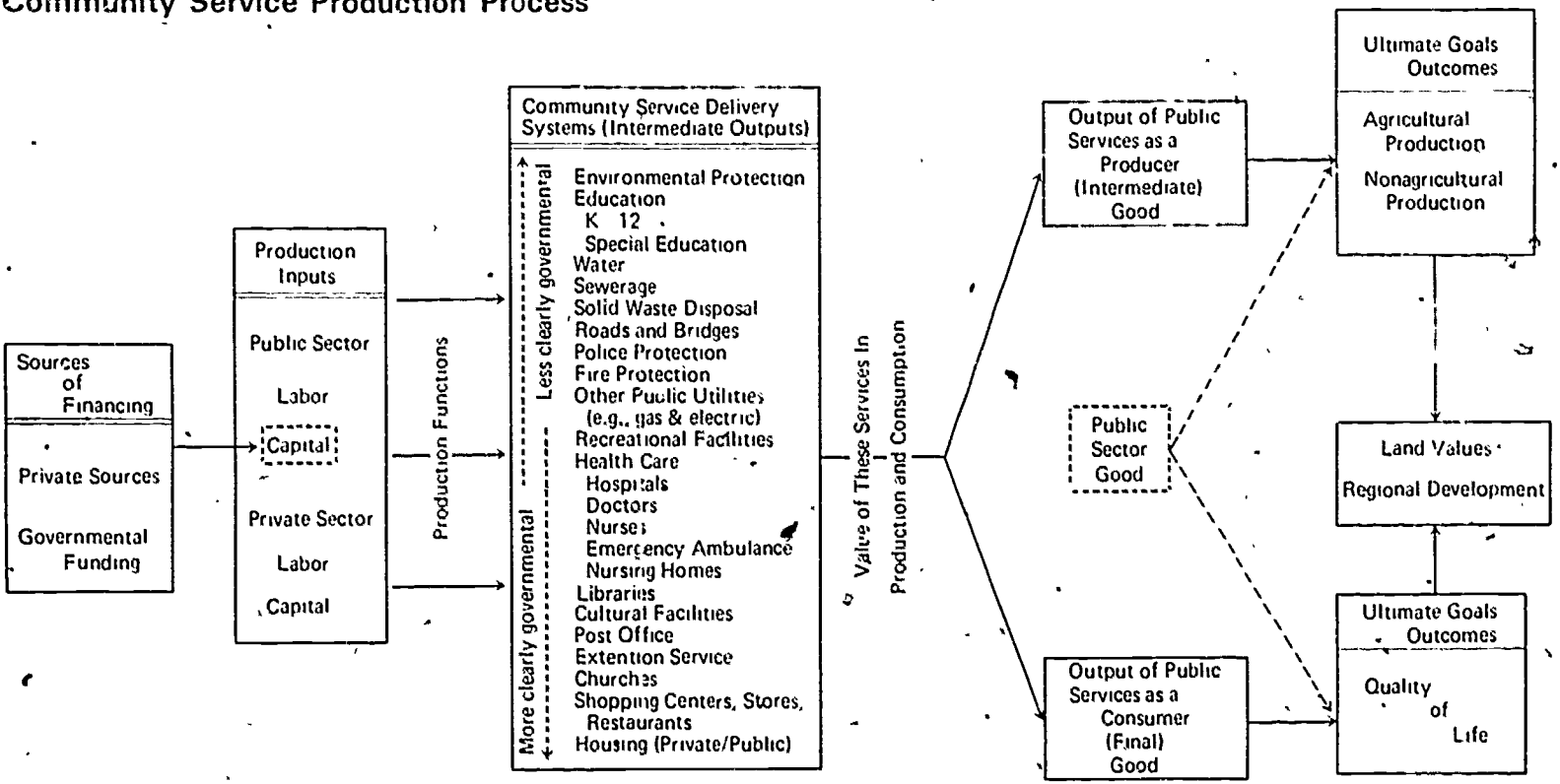
The basic question to be asked in formulating a program of research having a public services focus is: What are the ultimate economic and social goals that government policy seeks to advance? This question leads to the next: How, and in what degree, do public services contribute to the achievement of these goals? Next follows the question: How are economic resources (capital facilities, among others) used to produce these public services (that is, what is the nature of their production functions)? And finally, there is the question: How can these needed economic resources be obtained most efficiently?

The framework sketched in figure 1 depicts the ultimate goals of public services, the two aspects of public service output (final consumer good, or intermediate producer good); the specific public services assumed to contribute to these goals; and the general classes of inputs needed to produce these public services. The important research needs and opportunities are evident in the linkages, shown in the diagram by arrows.

On the right side of the diagram are listed the presumed economic goals. Governmental activity (provision of public services) can be thought of as advancing goals of consumers or producers. In so doing, public services and facilities have side effects on patterns of regional and community development, land values, and perhaps other interesting economic variables. These side effects result from the contribution of public services to private production and consumption, but include also the essentially redistributional effects associated with the generation of economic rents.

The achievement of economic goals of producers and consumers depends on the availability (and cost) of all sorts of goods and services. Most of these are produced in the private sector and are of little or no interest to government. Some, however, do fall within the purview of government for the classical public goods reasons. Some of these goods and services involve externalities either of production or consumption calling for governmental intervention. The school system is a good example. Others, sometimes called "merit goods," are

Figure 1
Community Service Production Process



services or goods that contemporary standards suggest should be available to all; examples include education and health care. It is the responsibility of government to assure that at least some minimum level of service be available to everyone.

Still other goods and services have the essential public goods characteristics that, if provided, they benefit all in a nonexcludable and nonrival way. Certain roads and streets fit this description at least in part, as do sidewalks, storm sewers, and police and fire protection. Finally, some are essentially private goods, but due to economies of scale or perhaps other reasons are commonly provided in the public sector. Water supply and sewerage are examples.

All these public services are not ends in themselves. They are means to achieving more fundamental consumption or production goals. For example, expenditure on fire protection is presumably intended to reduce property damage due to fire, or to prevent loss of life.

But, a governmentally provided fire department is not the only means to achieve that end. Smoke alarms and sprinkler systems are often more cost effective substitutes.

Nearly all the things we call public services have private sector alternatives. There is no compelling reason for these needs to be met, in every instance, through governmental action requiring public services and facilities. The absence of some service or facility need not necessarily indicate the existence of a problem, but may reflect only that either (1) the people involved do not need or want the service enough to pay for it, or (2) they can better meet their need through some alternative.

Figure 1 recognizes the private sector as an alternative source for meeting demands (either of a consumer or a producer nature) commonly met through public services. This connection suggests the desirability of researching the substitute (or complementary) relations that may exist between public and private goods.7/

With respect to both the producer- and consumer-good aspect of public services, an area for research concerns the perceived significance of various kinds of public services.8/ Such studies, presumably of a market survey nature, would be valuable to local decisionmakers in choosing the level and mix of public services. The Federal role coming most clearly into focus is that of developing such survey techniques and perhaps encouraging dissemination of findings of studies carried out by local communities or States. Public services are also an essential component of level-of-living measures in which USDA has long had an interest.

The role of public services as a producer good has been explored most fully in connection with transport networks and water supply.9/ This line of research deserves to be extended to other public services that represent significant inputs in private sector production functions. The USDA research tradition having to do with agricultural production functions is well established. Less well established is research on the significance of public services (beyond transport and water) in local economic development. Far more attention has been given to the tax side of the public finance equation than to public

services in the effort to understand the dynamics of local economic development and the role of public policy in stimulating such development. Since public services are rarely priced, there is no direct evidence on the value placed on them by users. The techniques of market anlysis, or consumer behavior studies, might be adapted to provide measures of the value of public service output, or to identify proxy variables that could reliably be used as such measures.

A better understanding of the significance of public services, both as consumer and producer goods, would also provide a basis for more efficient user pricing.

RESEARCH ON PUBLIC SERVICE PRODUCTION FUNCTIONS

Figure 1 lists the major public services, generally in order of how clearly governmental they are. Thus, environmental protection seems most clearly to be a public good, followed by such traditional services as education, roads (including maintenance, snow removal, storm sewers), and police and fire protection. The list continues with categories that are primarily private or market goods (health care, public utility services). It ends with community services and facilities such as churches, stores, banks, and restaurants that rarely, if ever, are governmentally provided, yet are significant both to the quality of rural life and to the economies of rural areas. The ordering is imprecise and need not be considered here, as is also the question of how far down this list one goes in identifying services that justify governmental concern and research. There is no debate that those near the top of the list merit governmental attention, though even here differences may arise as to whether they are the concern of Federal government, the States, or the local communities.

Also shown are the major kinds of inputs needed to produce public services. These may be classified, first, into public and private inputs, and second, into labor and capital. Public capital inputs consist of the community facilities that are the focus of this essay. Public labor inputs consist of public employees. Private capital and labor inputs are also used in producing public services under contract by private suppliers.

A major category of research needs and opportunities concerns the relationship between these inputs and the public service outputs of interest to consumers, that is, the public service production functions. Little seems to be known, either in theoretical or empirical terms, about the nature of production functions for public services. At the micro level, such studies, in addition to being service-specific, would presumably need also to be specific to the nature of the environment, as well as to technology. They would be useful for the light they might shed on the input requirements for given levels of public service output. And, they might give insight to the substitutability between capital and labor and the estimation of marginal productivity of capital in various kinds of service delivery systems. The general purpose, or concern, motivating such studies is that of increasing the efficiency of resources used in the production of public services.

Several other areas of research relating to public service productior deserve attention. One concerns the development of technology for providing services

of various kinds under conditions of sparse population, to isolated households, or in small communities. Such "miniaturization" of service delivery systems includes the development of better methods of treating wastewater, obtaining and treating onsite water supplies, and providing health care and education. Much has been done, chiefly in the private sector, in designing service delivery systems suitable to such small-scale use. A systematic review of the state of the art, function by function, might identify areas in which technological/innovation is lacking and in which private research and development needs to be supplemented by governmentally sponsored activity.

A closely related body of research concerns the development of alternative methods of delivering public services, including spreading sewage on open fields as fertilizer, using strategically placed dumpsters for solid waste disposal in rural areas, and burning trash for energy. Research might usefully focus on encouraging, reporting, and evaluating experiments that local areas might undertake, and analyzing the economic feasibility of such innovations under various conditions.10/

Research on different methods of organization and delivery of public services could be useful in alerting decisionmakers to alternatives to conventional practices. For example, it appears that more local communities are turning to private contractors for traditionally public services. Interlocal contracting or other forms of intergovernmental cooperation are becoming more widespread. Some research has been given to the reliance on volunteers in lieu of paid public employees.11/ A coordinated program of research on this group of related topics might bring out both the advantages and pitfalls of innovative service delivery systems.

Local government decisions involving public facilities require some sort of balancing of benefits against costs. The basic theory of benefit/cost analysis is reasonably clear, but its application is less well understood. There is a need for illustrative analyses and models to enable local decisionmakers to choose more easily cost-effective technology, decide whether to repair an old installation or piece of equipment, purchase a new one, or abandon it altogether.

A somewhat different topic for research, still dealing with the production and delivery of public services, concerns the effect of State and Federal mandates or restrictions on the presence or absence of certain services or facilities, or on the type of facility. A specific question, for example, is whether these mandates, commonly expressed in engineering terms, create a bias toward capital-intensive service delivery systems, or toward standard rather than innovative technology. A recent Congressional Budget Office study, for example, suggests that Federal programs and assistance have created a bias toward construction rather than toward maintenance and repair.12/ A related issue concerns the extent to which service norms are defined in terms of inputs rather than outputs, and the consequences of this misdirected emphasis.

OBTAINING RESOURCES FOR PROVISION OF PUBLIC SERVICES AND FACILITIES

The left hand side of figure 1 represents the earliest or most basic step in the process by which public services are produced. Here we find the problems encountered in the markets for inputs for production of public services. These

are problems, such as market imperfections, encountered in obtaining capital and labor. Thus, obstacles to recruitment and retention of skilled public personnel might be considered here, as might training programs, collective bargaining, public sector pay scales, and the whole of public personnel management, all of which lie beyond the scope of this paper.

One important area for research at this end of the spectrum concerns the financing of capital facilities. The first question to be addressed is: what reason, if any, is there to believe that private capital markets do not work satisfactorily in giving small rural communities access, on reasonable terms, to funds necessary for construction or purchase of capital facilities? Their small size, or lack of credit rating, or unavailability of information (either to lenders or to borrowers), or other reasons may render small communities unable to finance their capital investment programs on reasonable terms.13/ If problems of this sort are found, then research may be appropriately devoted to (1) exploring the nature and causes of this market failure, and identifying and evaluating actions or policies that might enable markets to operate better; and (2) exploring the possible role of government in providing credit where private lenders cannot or will not. Such research should be predicated on an identification of the public purpose to be served by government credit programs.

Not only the Federal Government, but the States as well, may have a role in providing financial assistance to small communities in obtaining needed credit. Several States, for example, either provide local communities with advice and assistance in obtaining credit from conventional sources, or advance funds to them directly. The experience of States with such institutional innovations deserves to be reported and evaluated.

OTHER LINES OF RESEARCH

Several other lines of research do not readily fit into the scheme outlined above:

--Not much progress has been made in empirical analysis of benefit spillouts from public services. That these extraterritorial benefits exist, and are quantitatively significant, is the presumption underlying most intergovernmental grant programs, including specifically those targeted on capital facilities. The same concept (externalities) serves as the rationale for much governmental expenditure at all levels. Yet the concepts have rarely been made operational. Little or nothing is known about the most basic question of the nature, magnitude, and geographic pattern of benefits from various kinds of public services. Rational public policy requires some pathbreaking research in (1) conceptualizing and (2) measuring such spillover benefits.

--The relation between population change and the demand for public services and facilities has often been studied, either at the community level or in analyzing some specific program or facility. Cross sectional studies have also examined the question in aggregative terms. I am not aware of anything that attempts to determine the effect of projected population growth, or shifts from

one geographic area to another, on the aggregate amount of public investment expenditure in various capital facilities. Studies of this sort would seem to have value, not only at a national level of aggregation, but at the State level as well.

--There are certain fundamental data gaps that frustrate research on many important public finance problems. Data on public service outputs are either seriously deficient, or totally absent, for most public services. In focusing on public service inputs rather than outputs, the NRCFAS data base illustrates this misplaced emphasis. The value of these data would be enhanced by the development of some corresponding data on public service output, so that research could proceed on the analysis of the production functions that link the facilities and the output. The fact that output is extremely difficult to measure for many public services should not be an excuse for not making the effort. Such data, being rare, are extremely valuable. USDA is well positioned to undertake such pathbreaking work.

HOW AND BY WHOM WOULD SUCH RESEARCH BE USED?

A fundamental issue to be addressed in considering research needs and opportunities concerns the potential user of the research, and the way in which the research might be expected to lead to ultimately beneficial results for citizens and taxpayers. Research on public services and facilities presumably is intended to inform decisionmaking at various levels of government, thereby leading to better decision processes and outcomes and ultimately either to more efficient private sector production or to higher levels of consumer welfare. In the present context of limited government and of critical scrutiny of any proposed area of governmental involvement, it becomes especially important to consider the questions: What is the fundamental cause of governmental involvement? Wherein does there lie any "market failure?" What reason, if any, is there for thinking that there is a problem, to which government, relying on results of research such as discussed here, can provide a solution? And, if there is recognized to be a problem to which governmental action can offer a solution, should that action be taken at the national, State, or local level?

Consideration of these questions leads to the identification of a number of matters calling for research focused on Federal decisions or activities. Among these are:

--Research designed to identify and quantify the Federal Government role in providing and financing governmental infrastructure in rural areas. One worthwhile research objective would be to identify and quantify the spillover benefits generated by public facilities; in particular, those benefits that may have a national dimension. Another would be to determine the extent to which certain public services (and the facilities necessary to their provision) can be said to meet "merit wants," that is, to constitute an essential element of a lifestyle to which every American should be entitled, as a matter of right.

--To the extent that a Federal interest is identified, research may be needed on the optimum form of funding assistance, or the optimum combination of forms, including direct Federal grants, loans, and loan guarantees, and the economic basis for determining the appropriate cost-sharing ratio; that is, the efficient and/or equitable percentage of cost to be borne by the Federal Government, the State, locality, and private user.

--If private sector efforts are found to be inadequate, federally funded research and development activity might appropriately be directed toward new technology that may allow small communities, or individuals living in isolated surroundings, to gain access to public services normally available only in more populous communities. Examples might be "miniaturized" water purification systems, sewage treatment systems, or use of advanced communication technology to provide such services as education, medical care, and police protection.

--Research focused on the consequences of Federal tax policies for provision of rural community services and facilities such as the consequences of allowance of the Federal income tax deduction for State and local taxes, and for interest on State and local bonds. It is possible, for example, that these deductions significantly favor larger communities, in which community services and facilities are commonly provided through public financing, over smaller communities and rural people, who often provide the same services for themselves without the benefit of the tax-deduction subsidy.

--Finally, there is by well-established tradition a Federal role and responsibility in providing data (collected through surveys and censuses) for use by both national and local researchers and decisionmakers, and for private users as well.

Other research directions seem to focus more clearly on possible actions or policies of local or State/local governments. Among these are:

--Research of a "how-to-do-it" sort; focusing on such matters as project evaluation, cost/benefit analysis, cost effectiveness studies, the organization and management of local public service delivery systems, and encouragement and reporting of experimentation in innovative systems and technologies. Such studies would improve the quality of local decisions on investments in community facilities.

--Research on the economics of cost sharing in financing of local community facilities; such as, the proper public/private division of costs and the proper role of user charges.

--Research on the contribution of public facilities (and services) to local economic growth and development.

Finally, some avenues for research have implications for decisionmakers at all levels of government, and for private decisions as well.

--Research on public service production functions, for example, could feed into either Federal, State, or local policy decisions. At the Federal level, such research could direct research and development efforts concerning public service delivery technologies, as well as cost sharing ratios and the various strategies and techniques for financial assistance. At the local level, research on production functions could give insight into project evaluation techniques and financing (user-pricing) policies.

--Since public services often are a significant input in private production processes, research is needed on the role played by public services in private production functions.

SOME THOUGHTS ON RESEARCH PRIORITIES

Research on governmental facilities needs to be considered within the broader framework of those services to consumers and producers that government can most appropriately provide. This larger frame of reference suggests limitless unanswered questions and research needs. It calls for some basis for establishing priorities among these myriad possible research undertakings.

There are many criteria by which one might attempt to establish priorities. Most obvious is some sort of judgment of benefits and costs, in which the potential benefit (whether it be a general, theoretical advance or some readily applied, immediately beneficial research finding) is weighed against the cost. Both benefits and costs are highly speculative, and can only be guessed at in rough terms. This criterion, nevertheless, serves as a guide to the following comments.

There are other criteria by which one might prioritize. These include, to mention only a few: political appeal (whether within USDA, or with the Congress, or with some important client group); feasibility (that is, whether it lies within the institutional and staff capability of Economic Research Service); and interest in the subject on the part of the researchers. While these considerations have not been totally ignored, neither are they explicitly considered in the following judgments of relative priorities.

Research Drawing on or Extending the NRCFAS Data Base

One obvious option is that of replicating the NRCFAS survey to provide the same information for two points in time. Such an undertaking does not deserve high priority on the USDA research agenda. Not only is it highly costly, but until a clear policy focus and a coherent theoretical rationale are developed, such an undertaking should be deferred.

Of higher priority is the development and sharing of USDA expertise in defining and measuring public facilities. While not really "research," perhaps, this nevertheless seems to be one of the most important (and least costly) contributions USDA can make to the ongoing interest in measuring the condition of the Nation's infrastructure.

Research Having a Policy or Conceptual Focus

The most urgent research needs are those that would advance our understanding of the true economic significance of public services and facilities in enhancing the quality of life. Perhaps most basic is the need for research exploring the relationship between public facilities and public service output; that is, research on public service production functions. In the past, such work has proved intractable, partly because of the great difficulty in defining and measuring public service output. Efforts along this line should nevertheless be continued, and USDA seems well suited to lead the effort.

Less fundamental, but still of major importance, would be research focused on the question of how Federal and State mandates and/or restrictions affect public expenditure and investment decisions. To what extent have these created a bias toward capital intensive service delivery systems, toward standard rather than innovative technology, and toward new construction rather than repair or abandonment?

Research on problems in financing capital facilities also seems important, and clearly within the USDA research tradition. The central question is that of identifying sources of imperfections in capital markets, exploring strategies for reducing these imperfections, and ascertaining the most effective governmental actions to make capital available to small and rural communities on competitive terms.

Other Lines of Research

A fundamental problem in public finance, particularly relevant to the research program of USDA, is that of identifying and measuring benefit spillovers. These spillovers provide the basic theoretical rationale for Federal and State subsidization of specific public services and facilities. Yet, very little is known of their geographic dimensions or quantitative importance. Formidable difficulties are involved, but USDA seems well suited to undertaking the painstaking and potentially pathbreaking work needed.

Closely related is the need for research on the economic basis for cost sharing among the various beneficiaries of locally provided public services--the immediate user, the local community, the State, and the Nation. Analysis of spillover benefits, as discussed above, is central to this issue. But on a more mundane level, much good could come from a thoughtful consideration of the conceptual guidelines for cost sharing, and a review and evaluation of actual practice in terms of these criteria.

FOOTNOTES

1. J. Norman Reid et al., Availability of Selected Public Facilities in Rural Communities: Preliminary Estimates, ERS Staff Report AGES840113, U. S. Department of Agriculture, March 1984; and J. Norman Reid and Patrick J. Sullivan, Counting Community Capital: The Status of Rural Infrastructure, 1984 Agricultural Outlook Conference, Nov. 2, 1984.

2. See for example, Pat Choate and Susan Walter, America in Ruins, Durham, Duke University Press, 1981; and U.S. Congressional Budget Office, Public Works Infrastructure: Policy Considerations for the 1980's, Washington, GPO, April 1983.

3. For an alternative framework designed to focus on questions of judging the adequacy or inadequacy of selected services or facilities, see Fred J. Hitzhusen and Ted Napier, "A Rural Public Services Policy Framework and Some Applications," Chapter 9 in Rural Policy Research Alternatives, North Central Regional Center for Rural Development, Iowa State University Press, 1978.

4. See D.F. Bradford, R.A. Malt, and W.E. Oates, "The Rising Cost of Public Services: Some Evidence and Reflections," National Tax Journal, June 1969, pp. 185-202.

5. Among those who have discussed the conceptual and practical issues in defining and measuring public services is Elinor Ostrum in "Why Do We Need Multiple Indicators of Public Service Outputs?" pp. 277-286 in National Conference on Nonmetropolitan Community Services Research, prepared for the Committee on Agriculture, Nutrition, and Forestry, U.S. Senate, Washington, D.C., GPO, 1977. See also "Output and Costs of Local Government Services," by Werner Hirsch, ibid., pp. 307-319.

6. This distinction is not to be confused with the one made, initially, in the NRCFAS survey between "service facilities" and "production facilities," the former defined as those the produce services which are "consumed where they are produced" (schools); the latter, those that produce goods and services that are "consumed elsewhere" (fire stations). (Reid and Sullivan, op. cit.)

7. See for example, Charles L. Vehorn, "Market Interaction Between Public and Private Goods: The Demand for Fire Protection," National Tax Journal, March 1979, pp. 29-39.

8. See Don A. Dillman, "Preference Surveys and Policy Decisions: Our New Tools Need not be Used in the Same Old Way," pp. 259-275 in National Conference on Nonmetropolitan Community Services Research, op. cit.

9. See for example, Dennis Warner and Jarir S. Dajani, Water and Sewer Development in Rural America: A Study of Community Impacts, Lexington, Mass., Lexington Books, 1975; and W. Cris Lewis, et al., Regional Growth and Water Resource Investment, Lexington, Mass., Lexington Books, 1973.

10. One example of such a program of research is described by Fred J.

Hitzhusen in "Community Economics of Solid Waste Management," mimeo, Department of Agricultural Economics and Rural Sociology, The Ohio State University, Columbus, Ohio, 1981.

11. See for example, William L. Manz and Fred J. Hitzhusen, Costs and Financing of Volunteer Emergency Ambulance Services in Rural Ohio, Research Bulletin No. 1110, Ohio Agricultural Research and Development Center, April 1979.

12. U.S. Congressional Budget Office, op. cit.

13. Evidence that small communities are at a disadvantage in capital markets is presented by John E. Petersen in "Small Borrowers in the Municipal Bond Market," pp. 65-76 in National Conference on Nonmetropolitan Community Services Research, op. cit. See also by Patrick J. Sullivan, The Cost of Metro and Nonmetro Government Borrowing (U.S. Department of Agriculture, Economic Research Service, Rural Development Research Report Number 35, January 1983), and Examining the Rural Municipal Bond Market (U.S. Department of Agriculture, Economic Research Service, Rural Development Research Report Number 34, January 1983).

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