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Rhoda

Urban and Regional Analysis for Development

Urban and Regional Analysis for Development Planning

Richard Rhoda

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Urban and Regional Analysis for Development Planning

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About the Book and Author

Urban and Regional Analysis for Development Planning

Richard Rhoda

Dr. Rhoda concisely presents the wide range of analytical methods available to urban and regional development planners. Focusing on the needs of the practitioner, in each chapter he concentrates on a particular analytical issue, describing several types of relevant analyses and offering guidelines for selecting appropriate techniques to solve specific development-oriented problems. Emphasis is placed on methods that use existing data and resources rather than sophisticated forms of data collection and statistical analysis. A final section, comprising case studies from Panama and Costa Rica, illustrates how many of the methods presented in the book were applied in specific settings.

Dr. Rhoda received his doctorate in geography from the University of Iowa. He has had field experience in twenty-eight Third World nations and is currently assigned to the AID mission in the Philippines.

Urban and Regional Analysis for Development Planning

Richard Rhoda

Westview Press / Boulder, Colorado

To
Bill and Eric

A Westview Replica Edition

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Foreword

One of the early goals of the Office of Urban Development in the Agency for International Development was to make available to development assistance planners and practitioners more and better information about useful approaches, methodologies, and techniques in addressing the consequences of rapid urbanization. Not only were there serious informational gaps which needed to be filled, but also there was more information available than was being used.

Development practitioners have been schooled in sectoral analysis. As a means of identifying and designing development projects, they divide a country into sectoral components (e.g., agriculture, education, health, and so forth), and investigate the characteristics and interactions within the sectors. A contrasting approach is to divide a country along spatial dimensions -- namely, the regions, districts, cities, and communities within a metropolitan area -- and to investigate the activities, processes, and dynamics within and between these units.

The latter approach is urban and regional analysis. Making practitioners more aware of its methods and utility in developing country situations prompted one of the first projects developed by A.I.D.'s Office of Urban Development. A preliminary set of guidelines for urban and regional analysis was prepared in 1976. These guidelines identified types of urban and regional analysis and their appropriate uses for development activities.

Almost before the guidelines had been completed, there were opportunities in several of the Agency's field missions to make use of them. As a result there were field applications and demonstrations of the guidelines in Costa Rica, Panama, and Nicaragua in 1977. It is interesting to note that these field tests represented a range of spatial units. In Costa Rica the guidelines were used in the metropolitan area of San Jose, providing the analysis for an urban development loan project. In

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Panama they were used in a remote rural region to assist with the design of a rural regional development project. In Nicaragua they were employed in a national urban sector assessment.

These field experiences proved to be very instructive. The draft guidelines made a significant contribution to all three projects. In addition, there was considerable feedback from the field tests which was useful in revising, improving, and expanding the guidelines. Urban and Regional Analysis for Development Planning is the result.

The Office of Urban Development was most fortunate in having had the professional services of Richard Rhoda during this process. He brought his inquiring mind and considerable investigative and analytical skills to the task, as well as a professional interest in the spatial aspects of planning and development. He was involved in monitoring and evaluating the field demonstrations and in distilling the lessons learned therefrom. Finally, he has devoted a considerable amount of time revising the analytical package in the light of those demonstrations and taking account also of the improved state-of-the-art.

We are grateful to Dr. Rhoda for the professional skill and interest and for the personal dedication he has brought to this work, and especially for the contribution he made to the work of the Office of Urban Development and to the development assistance community.

*William R. Miner
Director
Office of Urban Development
Bureau for Science and Technology
Agency for International Development
Washington, D.C.*

Preface

Sectoral analysis and urban and regional analysis are two different means of investigating development situations and identifying project opportunities. The sectoral approach begins by separating a country into sectors; the characteristics of these sectors then are investigated. In contrast, urban and regional analysis starts by dividing a country into spatial units and then studies the activities and processes within and among these spatial units.

The present volume was developed as part of the "Urban and Regional Analysis" project initiated in 1975 by the Office of the Urban Development, U.S. Agency for International Development. The objective of the project was to provide development planners with practical knowledge of urban and regional analysis. In the past, practitioners generally have used sectoral analysis as a means of identifying and formulating development projects. While this is useful in many situations, an urban and regional approach also has an important contribution to make. Yet most practitioners have been schooled in the sectoral approach and therefore are not fully aware of methods and techniques associated with the other perspective. The present book attempts to rectify this situation by providing practitioners with basic information concerning types of urban and regional analysis and their uses. While there are other books on this topic, they tend to be theoretical and they rely on very sophisticated quantitative techniques; thus they often are not suited to the practical realities of development intervention in third world areas.

The book should be considered as only an introduction to types of urban and regional analysis; it is not meant to be a comprehensive textbook, a "how-to" manual, or a "statement-of-the-art" document. This presentation is limited to practical applications; thus analyses solely designed for scholarly research and theory development are excluded. In addition, the book is designed for use by existing development agencies; therefore, it assumes a liberal, growth with equity, ideology within national and global economic and political structures. This focus means that some current types of analysis within the dependency paradigm

are not included. Readers desiring additional information on this paradigm are referred to the works of Amin, Frank, Santos and others.¹ Though the dependency paradigm is gaining popularity among scholars, its implications for development interventions normally begin with substantial changes in existing national and/or global economic systems. This book is based on a more traditional ideology which takes the basic economic system as given and which attempts to promote growth with equity within that system.

The intended users are planners and other practitioners working within third world development agencies. The users are expected to be familiar with general development problems; however, no formal knowledge of urban and regional development or analytical techniques is assumed. The focus is on readily available data sources and techniques which can be used both to gain essential background on patterns and processes of urban and regional systems and to generate information which may contribute to project design and evaluation.

The book is not meant to be read sequentially from first page to last. Instead, each chapter describes a different type of analysis and may be read separately or referred to from time to time as the need arises. Still interrelations between types of analyses are identified and discussed; cross references are provided where appropriate.

Each main chapter provides a description of a type of analysis and its relevance to development agency activities. A list of the kind of questions which can be addressed by that analysis is presented. The questions are important because they indicate the purpose of the analysis and act as a guide to the selection of the particular type needed in specific development situations. Appropriate data and their sources are discussed. Emphasis is placed on the utilization, to the greatest degree possible, of existing data sources; in general, new data collection surveys are not recommended. Sources of further information are referenced in an annotated bibliography at the end of each chapter. These are limited to documents in English and efforts were made to include only those which are readily available. Books and reports by international development agencies were preferred to journal articles because of their practical orientation, comprehensiveness, and availability.

Part Five of the book presents and compares two case studies which demonstrate the use of urban and regional analysis in the context of development interventions.

Richard Rhoda, Manila

NOTES:

1. Samir Amin, Accumulation on a World Scale: A Critique of the Theory of Underdevelopment (New York: Monthly Review Press, 1974). Harold Brookfield, Interdependent Development (London: Methuen, 1975). Andre Gunder Frank, Capitalism and Underdevelopment in Latin America (New York:

Monthly Review Press, 1967). John Friedmann and Robert Wulff, The Urban Transition (London: Edward Arnold, 1976). Anthony D. King, Colonial Urban Development: Culture, Social Power and Environment (London: Routledge & Kegan Paul, 1976). Alejandro Portes and John Walton, Urban Latin American: The Political Condition from Above and Below (Austin, Texas: University of Texas Press, 1976). Bryan R. Roberts, Cities of Peasants: The Political Economy of Urbanization in the Third World (Beverly Hills, Calif.: Sage, 1978). Milton Santos, The Shared Space: The Two Circuits of the Urban Economy in Underdeveloped Countries, adapted for publication in English by Chris Gerry (London: Methuen, 1979). Tamas Szentes, The Political Economy of Underdevelopment (Budapest: Akademiai Kiado, 1971).

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In undertaking a multidisciplinary project such as this, I found that comments and suggestions from people in a variety of disciplines were extremely useful. The book benefited greatly from the considerable feedback received on early drafts. The largest debt of gratitude is to Dr. William R. Miner and Dr. Eric Chetwynd, Jr., Office of Urban Development, USAID, who not only provided useful substantive comments and valuable style and editorial suggestions, but also supplied needed support and encouragement at all stages of the project. I am especially grateful to Bruce Herrick, Barclay Hudson, Thomas Eighmy and Julian Velasco-Arboleda who utilized early drafts for empirical analyses in Latin America. These field applications, from which the case studies in this volume were drawn, provided very useful feedback for subsequent drafts. Others who read early versions of the manuscript and supplied valuable comments, include Aaron Benjamin, Graham Bice, Edward Butler, Charles Boyce, John Dickey, Michael Farbman, Joselyn Fearon, Johannes Linn, Michael McNulty, Waldo Lopez, Carol Peasley, Larry Posner, and Raymond Urquhart. Though this work benefited greatly from the comments and suggestions of others, any opinions, conclusions, or errors are the sole responsibility of the author. A special acknowledgement is due to Marcy P. Esteban whose diligence and skillful word-processor operation transformed a relatively rough draft into the finished copy which appears herein.

Part 1

Introduction and Policy

PREVIOUS PAGE

1 Introduction

U Thant, when Secretary General of the United Nations, proclaimed the 1960s as the Development Decade and appealed to both rich and poor countries to make strenuous efforts to achieve economic and social development in third world areas. Attention was focused primarily on rapid growth in GNP through capital intensive industrialization. In addition to focusing on overall economic expansion, efforts were made to improve selected sectors; for example, many countries invested heavily in the expansion of formal education. There was widespread optimism at the beginning of the decade; many believed that with concentrated effort and heavy industrial investment during the 1960s, most third world countries could achieve self-sustaining growth that eventually would lead to the elimination of poverty. This optimism had all but disappeared by the end of the decade.

Though most third world countries experienced economic growth during the 1960s, the rates of growth were below expectations. Many countries suffered declines in real per capita income. The gap between rich and poor countries widened, imports outpaced export earnings, and many nations experienced serious balance-of-payments problems. The economic growth which did occur often benefited only middle and high classes. Low income segments of the population generally were excluded from the economic gains. Many poverty groups actually suffered a decline in standard of living during the decade. Population growth outpaced food production. In short, the Development Decade was a disappointment.

The experience of the 1960s brought about a search for alternatives to the economic-industrial and sectoral planning practiced during the decade. Third world countries and international assistance agencies turned away from these planning approaches and their implicit assumption that benefits of urban-economic growth would "trickle down" to low income groups and rural areas. Strategies were sought which placed more emphasis on equity and relationships between sectors. As a result of this search many countries decided to pursue regional development and other spatial planning strategies.

Latin American countries were the first group to grasp the regional development approach. In the mid-1960s many produced regional development plans based on the growth center concept. This derived from Perroux's notion of an economic "growth pole" or dynamic industry or sector which could stimulate development in related industries or sectors.¹ The growth center concept extended Perroux's notion into the spatial dimension; key industries, established at certain locations, could stimulate development in the surrounding region and in related industries and sectors.² Perhaps the most well-known example is Ciudad Guayana in Venezuela where the Government invested very heavily in steel and aluminum mills, natural gas production, cement factories, and infrastructure. Growth centers were accepted widely by both regional planners and governments during the late 1960s and early 1970s.

Unfortunately, the growth center strategy was in some ways similar to the industry focused economic growth approach of the early 1960s. Both were accepted uncritically as a development panacea, both concentrated on capital intensive industrial growth, and both relied on the "trickle down" theory of spreading benefits to low income groups and rural areas. The real difference between the two was that the earlier economic growth approach ignored the spatial dimension, thus assuring that investments would be made in primate cities, whereas the growth center strategy explicitly specified locations, usually excluding primate cities. The popularity of the growth center strategy was short-lived; by the mid to late 1970s the strategy, as originally conceived, was rejected by many scholars and planners.³

Fortunately, rejection of the original growth center idea was not accompanied by a wholesale rejection of spatial planning and regional development strategies. Quite the contrary, by the mid 1970s a large number of third world countries were pursuing variations of spatial planning.

A holistic view was being taken of areas selected for development and concern was directed toward the interrelationships between various sectors such as agriculture, industry, employment, education, and health.

In the early 1970s, international development agencies started to emphasize equity aspects of development projects. Whereas the focus of the 1960s was economic growth, that in the 1970s became growth with equity. Aid agencies began to insist that the projects they supported have demonstrable benefits for low income groups. The spatial planning approach, by virtue of its emphasis on variations between areas, is appropriate for efforts aimed at equalizing the spatial distribution of benefits. Yet this approach also can accommodate concern for equity within a region, i.e., vertical equity in the distribution of benefits among low, medium, and high income groups.

1. Footnotes appear at the end of each chapter.

Basic information needed for spatial planning can be obtained through urban and regional analysis. In addition, analyses also may provide information which is useful to a variety of related development activities such as understanding development problems and constraints, locating and characterizing target groups, identifying project opportunities, and formulating policy.

ANALYSIS

Appropriate analysis is a very important factor in successful development efforts. Most of the great failures, such as the well-documented Tanganyika Groundnut Scheme, can be attributed to incomplete or inappropriate analysis. The success of development activities is dependent upon adequate understanding of local conditions, socioeconomic processes, and the anticipated impacts of proposed interventions. This understanding can be significantly enhanced by careful analysis.

Analysis can take many forms. It can be very simple, such as a rough separation of national income into its basic components. It can be very complex and require millions of computations, such as a detailed regional input-output analysis. Preliminary "quick and clean" analyses are often very useful; they can provide needed background and indicate appropriate directions for subsequent investigations.⁴ Analyses frequently are conducted using an iterative style; the results of broadscope, preliminary investigations are compared to study objectives to determine if further effort is warranted. Sometimes these results are used to redefine or clarify the study objectives.

Some people falsely assume that analysis necessarily implies quantitative or statistical procedures. Analysis can be qualitative and based on verbal information. Such analyses often are used to describe development contexts or to identify the major features of crucial development problems. A model for qualitative analysis may consist of an ordered set of questions or topics to be considered. In this case, the investigation is performed by addressing the questions or topics using whatever information is appropriate and available. Judgements must be made concerning the importance or weight of the different factors which bear on the question under consideration. This is particularly important when the factors are conflicting.

Quantitative analysis generally is based on numerical data and usually involves mathematical or statistical procedures. It may be used to describe development situations, such as the percentage of people in a given area who are living below a specified poverty income level. Another use is the identification and measurement of relationships between selected indicators. For example, correlation techniques can provide a statistical assessment of the existence and strength of the relationship between, say, farm access to market towns and cash earnings per hectare.

URBAN AND REGIONAL ANALYSIS

Though closely related to other types of socioeconomic analysis, urban and regional analysis is identified by its spatial perspective. It deals with processes and characteristics both within and between such spatial units as regions, districts, cities, or communities within metropolitan areas. Examples include linkages between a market town and its surrounding rural hinterland, the characteristics and development potential of a specific region, the spatial distribution of poverty within a metropolitan area, or the factors which influence the provision of housing in a given city. It should be recognized that urban and regional analysis overlaps with, and draws upon, several social science disciplines including anthropology, economics, geography, political science, and sociology.

There is no clean dividing line between urban analysis and regional analysis. The former is actually a special case of the latter which focuses on patterns and processes within individual urban or metropolitan areas. It may even turn out that patterns within a city may result from processes operating elsewhere. For example, the rapid expansion of a squatter settlement may result from a persistent drought in another region of the country. In this case, an analysis of the squatter settlement might entail a discussion of the drought.

Analysis of the urban system focuses on the size, functions, and locations of all urban centers within an area. The urban system is viewed as an interconnected set of nodes which provide such needed functions as markets for agricultural products, industrial production, distribution points for farm inputs, education, health, and administration. These nodes may vary in size from large metropolitan areas to small towns.

Regional analysis may focus on a single region or a group of regions. Multiregional analyses compare and contrast the characteristics of individual regions as well as investigate interactions among them. An analysis of one region focuses on the spatial distribution of activities within the region and intraregional interactions. Such an analysis may consider also the relationships between the region and other regions.

Urban and regional analysis can make an important contribution to development activities. It can be used to make background assessments of countries, regions, or urban areas. Such assessments, which often are based on existing and readily available information sources, can provide a description of a wide variety of human and natural characteristics of the area. Assessments also may identify specific development problems and potential project opportunities. An example of such an opportunity might be the expansion of labor intensive agriprocessing activities in major market towns. If such an activity looks promising, additional analysis of key issues may be required before project identification documents can be written. These key issues might include potential for expanded agricultural production, supply of

labor, and availability of markets for agriproducts. Review of project identification documents usually reveal additional information gaps which require further analysis. In our example this might include more detailed investigation of key issues previously identified; for instance, potential for expanded output of specific agricultural products, or skill level of unemployed labor force at specific locations.

NOTES

1. Francois Perroux, "Economic Space: Theory and Applications," Quarterly Journal of Economics, 64 (1950). See also Francois Perroux, "The Domination Effect and Modern Economic Theory," Social Research, 17 (1950): 188-206.
2. J. R. Boudeville, Problems of Regional Economic Planning (Edinburgh: Edinburgh University Press, 1965). Antoni Kuklinski, ed., Growth Poles and Growth Centers in Regional Planning (The Hague: Mouton, 1972). Malcolm Mosely, Growth Centers in Spatial Planning (Oxford: Pergamon Press, 1974). Niles Hansen, ed., Growth Centers in Regional Economic Development (New York: The Free Press, 1972). United Nations Center for Regional Development, Growth Pole Strategy and Regional Development Planning in Asia (Nagoya, Japan: UNCRD, 1976).
3. Michael Conroy, "Rejection of Growth Center Strategy in Latin American Regional Development Planning," Land Economics, 49 (1973): 371-80. A. P. Gilbert and D. E. Goodman, "Regional Income Disparities and Economic Development: A Critique," in A. Gilbert, ed., Development Planning and Spatial Structure (London: John Wiley & Sons, 1976). Niles Hansen, "An Evaluation of Growth Center Theory and Practice," Environment and Planning, 7 (1975): 821-32.
4. Robert Chambers, "Rural Poverty Unperceived: Problems and Remedies," World Bank Staff Working Paper No. 400 (Washington, D. C. 1980).

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Analysis of Urban and Regional Policy

The objective of this type of analysis is to identify and describe relationships between governmental activities and urban and regional development. In this context, governmental "policy" is defined very broadly as any activity by public agencies which affects urban and regional development. It includes explicit, policies expressed in legislative plans as well as the unstated implicit, and often unintended ones. Some of the latter may result from decisions to do nothing. For example, squatter settlement removal as well as government tolerance and neglect of such settlements are both examples of urban policy. Though primary attention is concentrated here on the consequences of urban and regional policy, analysis also can be directed to the causes of this policy. We might ask for instance, what impacts public and private groups have on government urban and regional policy?

Explicit Policies

The number of countries with explicit urban and regional development policies has increased rapidly in recent years. These policies have come forth under a variety of labels such as growth poles, growth centers, regional development, intermediate-sized city development, urban decentralization, market towns, rural service centers, and rural development. Unfortunately, these labels never have been defined precisely and the concepts which they represent tend to be muddled. For example, the term "growth center" has been applied to major urban-industrial complexes and to small urban places serving surrounding rural areas. Furthermore, the term has been used to describe existing cities which developed naturally as well as the planned development of centers in previously unoccupied areas. Because of the clouded terms and concepts used in regional development, the label attached to a policy may not represent accurately the spatial development strategy advocated. Explicit regional development policies should be scrutinized carefully to determine their intent.

Most, if not all, explicit urban and regional policies attempt to stimulate development in communities outside the

largest, or primate, city. Such policies often are based on government desires to reduce the growth of low income populations in the primate city by diverting migration to secondary cities. The size of communities selected for concentrated development may vary from cities of over a million to rural villages. Policies generally call for increased productive activities and upgraded infrastructure in these places. Examples of countries which have adopted this type of approach to development include Mexico, Peru, Bolivia, Brazil, Panama, Kenya, Ghana, Tanzania, Nigeria, Cameroon, Turkey, Syria, Pakistan, India, Malaysia, and the Philippines.¹ The types of analyses generally used in the formulation of explicit regional development policies and plans are described in Part III, Regional Analysis.

Implicit Policies

Some countries have chosen not to have an explicit policy of urban and regional development. This choice, which is supported by some analysts² and attacked by many others,³ almost always results in the continued rapid growth of primate cities at the expense of smaller towns and other regions. The case for unrestrained growth of large cities is based on arguments of economic efficiency and the political difficulties of trying to divert development to other areas.

Almost by definition most countries have an implicit policy. The actions of all governments influence patterns of urbanization and regional development. Budget allocations, which may be directed by a policy of maximizing national economic growth, have differential impacts on various regions and therefore alter the spatial patterns of growth. For example, decisions designed to stimulate exports may increase income only in regions producing exports. This added income stimulates other economic activity and, consequently, may result in added migration to those regions. A decision to promote industry will stimulate growth through economic multipliers in areas which receive new industries. Also government in many areas is the major employer in the modern sector; government employees thus create a large portion of the demand for a variety of consumer goods such as housing, food, clothing, etc. This demand influences the locations of numerous business enterprises, which in turn stimulate other economic activities. These multiplier effects of government employment can have a strong influence on the spatial pattern of development. In short, a wide variety of government decisions and actions have impacts on regions and urban areas. These impacts usually stimulate development in certain areas and retard it in others. The net effect is an implicit urban and regional development policy.

Most analyses of implicit policies indicate that capital cities receive a greater than proportional share of government budget allocations and capital expenditures.⁴ Government employment usually is concentrated in capital cities and a higher level of government services normally are provided there. Subsidies and incentives often are available for modern industries

thus indirectly stimulating urban growth. Government controlled marketing boards may keep domestic commodity prices below world prices; the resulting profit often is invested in urban areas. Aside from these government activities, primate cities also receive a large share of private investment. Though these government and private actions may be perfectly justified on the basis of economic growth criteria, they stimulate the urban economy, promote increased migration and urban primacy, and may increase regional inequalities.

RELEVANCE TO DEVELOPMENT INTERVENTIONS

Urban or regional development plans, programs, and projects should be based on a clear understanding of national urban and regional development policy. Analyses described in this chapter attempt to provide this understanding as well as suggest useful information for policy formulation. For example, an investigation of a government's implicit urban and regional policy may reveal that the vast majority of government expenditures and activities stimulate growth and development in the capital city. This information then might be used as an argument for the adoption of a strong explicit policy which assures a more equitable distribution. Analysis also may reveal the degree of inconsistency between a country's explicit policy, which may favor development of small towns and villages, and its implicit policy which may promote growth and development of the capital. Knowledge of such inconsistencies can be useful for the development of new policies and implementation of existing programs.

TYPICAL QUESTIONS

- o What are the development objectives of the national government? How do these objectives impact on urbanization and regional development? How much leverage does government have on urban and regional growth processes?
- o Does the government have an explicit urbanization or regional development policy? If so, what is it? What programs are needed to implement the policy? Do such programs exist?
- o What are the regional and urban-rural allocations of government employment, expenditures, and benefits? How do they influence urbanization and regional development? Are they heavily concentrated in low or high income areas? What is the influence of the existing tax structure and other government regulations on the location of industry and other productive activities?

- o Is decreased rural-to-urban migration, especially to the primate city, a government goal? Is the urban-rural distribution of government expenditures consistent with this goal?
- o To what extent is government centralized in the capital? What kinds of decisions are made at national, provincial, district, municipal, or village levels?
- o What agencies in the national government are involved with issues of urbanization and regional development? What are their objectives, programs, or projects? What impacts do their activities have on urban and regional development? To what extent do the impacts of different government agencies reinforce or counteract each other?
- o What are the development objectives of regional, city, or local governments? Are these consistent with national development objectives?
- o What urban problems are of greatest concern to national and city governments? What are they doing to alleviate these problems? What is the degree of commitment to the urban poor?
- o Do urban and/or regional planning agencies exist? What type of planning is practiced? What kind of planning is conducted in periphery regions and small urban centers?
- o What interest groups or regions have the greatest influence on the distribution of government expenditures and activities? What mechanisms do low income groups or regions have to provide input to national policy? How effective are these mechanisms?

DATA SOURCES

Several types of data from a variety of sources may be used for this type of analysis. Data may be qualitative or quantitative and may come from public or private sources.

National Plan

A primary source of data is the national plan, which often indicates explicit regional development or urbanization policies. If none are stated explicitly in such documents, they may be present implicitly. For example, the relative importance placed on rural and agricultural development as opposed to urban-industrial development may reveal intended policy.

Other Government Sources

Government documents and reports of all types provide data for analysis of implicit urban and regional development policy. National budgets, especially those with urban-rural and/or regional breakdowns, give a quantitative indicator of government policy. Unfortunately, few countries have budgets with regional breakdowns. Government employment figures by area and sector are useful and often available in budget or labor reports or from documents of individual ministries and agencies. Censuses also provide data on regional distribution of government employment and activities. Data on public utilization of services such as school enrollments or health clinic attendance generally are available from appropriate ministries and provide an indicator of the distribution of government services. Other sources of data include government laws, pronouncements, decrees, or speeches by national leaders.

Other Sources

Though government is the primary source of data concerning urban and regional policy, relevant information also might be available from reports and analyses conducted by semi-private and private agencies such as banks, universities, private scholars and international organizations.

ANALYSIS OF DATA

National Development Plan

The national development plan should be scrutinized carefully to identify explicit and implied policies. If the plan contains an explicit policy, judgements can be made concerning the degree of commitment to that policy. For example, the plan may propose a focus on rural areas and small towns but a careful reading may reveal biases for big city projects and activities. Government pronouncements, reports and other information sources also can be analyzed to determine degree of commitment to stated policy.

If the plan contains few explicit urban or regional policies, a content analysis might be used to reveal implicit ones. This analysis is conducted by first formulating an urban and/or regional classification scheme and criteria. Each sector of the plan then is analyzed utilizing this scheme. For example, the classification may show several regions each divided into rural, small urban, and large urban communities. For each sector of the plan, a judgement is made concerning the regional and urban-rural distribution of benefits. A simplifying assumption might be made that the total benefits for each sector are equal to the proposed expenditure levels for that sector. Alternatively, total benefits may be estimated by assuming realistic multipliers for each budget element of the plan. After these calculations have been made, total

benefits to each area on a per capita basis can be compared to obtain an estimate of the urban-rural and regional impacts of the plan. Though this approach is very rough and dependent upon gross assumptions and considerable intuitive judgement, it does provide a method of assessing the implied urban and regional policy of a national development plan. On the other hand, the analyst must remember that a plan is only a document which may or may not correspond to the intended or actual activities of governments.

Government Activities

An analysis of the implicit urban and regional policy contained in the activities and decisions of governments may provide a more realistic view of government policy. Unfortunately, such analyses are usually difficult because appropriate data generally are not available.

Analysis of Revenues and Expenditures

If data permit, budget allocations can be subdivided by regions; by small, medium and large urban categories; and by sectors. By assuming per capita expenditures are related directly to benefits, a comparison by area can indicate the implicit policy.

Another approach is to compare the ratio of government expenditures to revenue collections for urban and rural subdivisions of each region. This helps to indicate the impact of government activities on the geographical redistribution of resources. High expenditures/collection ratios may reveal which areas benefit most from government development efforts. This type of analysis may reveal whether or not implicit urban and regional policy is consistent with the explicit policy as stated in development plans and other documents. Yet government expenditures may not indicate accurately the distribution of benefits from corresponding activities. Expenditures in one area may benefit adjacent areas. This is particularly true of expenditures in towns which benefit the surrounding hinterlands. Unfortunately, easy-to-use methods are not available for the accurate assessment of the spatial distribution of benefits from government activities.

Implied policy of government may be investigated using household profiles. For each region or for urban areas of each size, a profile can be developed of a typical household in each income category. The contributions of each household to government revenues then can be estimated. These may include taxes, license fees, and government marketing activities and price regulations. The likely contributions then can be compared to projected benefits from government activities. These benefits might come from: education, health care, agricultural extension, public housing, employment services, as well as subsidization of transport, water supply, sewerage and basic commodities. The comparison of contributions to benefits can help to reveal the implicit urban and regional policy of the government.

Analysis of Government Programs

The activities of specific government programs and agencies also can be analyzed to reveal implicit urban and regional policies. One approach is to identify each agency or program and then try to gauge its urban and regional impacts. For example, a Ministry of Agriculture may stimulate development in certain agricultural areas while a Ministry of Housing may concentrate its activities on large urban areas. This type of analysis at the ministerial level may provide a rough indicator of implicit policy. A more detailed investigation at the bureau or division level may produce better results. The study might use the content analysis approach described earlier.

Particular attention can be focused on those government programs expected to have strong implications for urban and regional development, for example:

1. Subsidies for modern capital intensive agriculture -- may contribute to rapid growth in some agricultural regions.
2. Marketing boards which impose an export tax by fixing domestic prices on agricultural commodities at a level less than the world price -- may restrict agricultural development in regions growing export crops.
3. Food subsidies and regulation of food prices -- may contribute to rural-urban migration by lowering the cost of living in urban areas and decreasing the incomes of rural food growers.
4. Tax concessions and other subsidies to attract international firms -- usually stimulate economic growth in the large cities where these firms tend to locate.
5. High import tariffs to protect infant industries -- may contribute to urban growth as employment is provided in urban industries which might not exist without government intervention.

These are only a few of the more obvious government programs which have implications for urban and regional development.

SOURCES OF FURTHER INFORMATION

- * Cohen, Michael A. Urban Policy and Political Conflicts in Africa: A Study of the Ivory Coast (Chicago: University of Chicago Press, 1974, 262 pp.). This book develops a theoretical framework for urban policy analysis and utilizes it to investigate interactions between government activities and urban development of Aidjan. Part Two analyses both the

explicit and implicit urban policies of the national government.

- * Kuklinski, Antoni. Regional Policies in Nigeria, India and Brazil (Hague: Mouton, 1978, 319 pp.). Presented is an excellent discussion of regional development policies of three major developing countries.
- * Linn, Johannes F. Cities in the Developing World: Policies for Their Equitable and Efficient Growth, published for the World Bank (New York: Oxford University Press, 1982, 352 pp.). This comprehensive study discusses policy issues surrounding the growth of third world cities. Attention is focused on urban poverty, employment, income redistribution, transportation, housing, and social services.
- * Lipton, Michael. Why Poor People Stay Poor: Urban Bias in World Development (Cambridge, Mass.: Harvard University Press, 1977, 479 pp.). Presented is a comprehensive analysis of the implicit policies in developing countries which tend to favor urban areas and discriminate against rural areas.
- * Richardson, Harry W. "City Size and National Spatial Strategies in Developing Countries," World Bank Staff Working Paper No. 252 (Washington: IBRD, 1977, 73 pp.). Several spatial development strategies are analyzed and evaluated; particular attention is focused on centralization-decentralization issues. The paper is based on theoretical and empirical knowledge concerning the size, structure, and functions of cities in developing areas.
- * Renaud, Bertrand. National Urbanization Policies in Developing Countries, Published for the World Bank (New York: Oxford University Press, 1981, 192 pp.). This excellent book investigates explicit and implicit national policies which affect the distribution of urban growth among cities of various sizes. Appropriate national urbanization policies are discussed in three dimensions: (1) unintended spatial effects of national economic policies, (2) more efficient internal management of cities, and (3) decentralization policies to increase efficiency and national integration.
- * Scioli, Frank P. and Thomas J. Cook, eds. Methodologies for Analyzing Public Policies (Lexington, Mass.: D. C. Heath and Company, 1975, 171 pp.). Articles focus on several aspects of policy analysis including indicators for measuring policies, research designs for policy analysis, quantitative and statistical techniques, and cost-benefit and cost-effectiveness analysis. Though the book concentrates on policy analysis in the United States and doesn't focus on urban and regional policy per se, it does discuss a number of

issues and techniques which are relevant to urban and regional policy analysis in the third world.

* Selowsky, Marcelo. Who Benefits from Government Expenditure? A Case Study of Colombia, Published for the World Bank (Oxford: Oxford University Press, 1979, 202 pp.). Demonstrated are analytical methods which can be used to identify the beneficiaries of government services.

* Stohr, Walter. Regional Development Experiences and Prospects in Latin America (Hague: Moulton, 1975, 186 pp.). Analytical methods are presented for the evaluation of regional development policies and programs. A detailed analysis, comparison, and evaluation is provided of seventy-five national and international efforts at regional development. The following regional development strategies are assessed: decentralization of decision-making, depressed area policies, colonization and resource frontier policies, border area development programs, and metropolitan area and new growth pole policies.

Cohen, Michael, S. A. Agunbiade, Daniele Antelin, Anne de Mautort. "Urban Growth and Economic Development in the Sahel," World Bank Staff Working Paper No. 315 (Washington: IBRD, 1979, 120 pp.). The paper presents a framework for urban and regional policy analysis and uses it to investigate Sahelian countries.

Findley, Sally. Planning for Internal Migration: A Review of Issues and Policies in Developing Countries, Prepared for U.S. Bureau of the Census (Washington, D. C.: USGPO, 1977, 167 pp.). Chapter Six discusses policies which have differential impacts on urban and rural areas.

Rondinelli, Dennis A. and Kenneth Ruddle. Urbanization and Rural Development: A Spatial Policy for Equitable Growth (New York: Praeger, 1977, 221, pp.). Policies leading to urban centralization are contrasted with decentralization strategies. Attention is focused on the appropriate roles of international assistance agencies and national and local governments in implementing balanced spatial development.

NOTES

1. Sally Findley, Planning for Internal Migration: A Review of Issues and Policies in Developing Countries, Prepared for U.S. Bureau of the Census (Washington, D. C.: USGPO, 1977).
2. Harry W. Richardson, "City Size and National Spatial Strategies in Developing Countries," World Bank Staff Working Paper No. 252 (Washington, D. C.: IBRD, 1977). E. S. Mills,

"Welfare Aspects of National Policy Towards City Sizes,"
Urban Studies, 9 (1972): 117-24.

3. Alan Gilbert, "The Arguments for Very Large Cities Reconsidered," Urban Studies, 13 (1976): 27-34. R. J. Johnston, "Observations on Accounting Procedures and Urban-Size Policies," Environment and Planning A, 8 (1976): 327-339.
4. Michael Lipton, Why Poor People Stay Poor: Urban Bias in World Development (Cambridge, Mass.: Harvard University Press, 1977).

* Particularly useful sources of further information.

Part 2

Urban and Regional Population Characteristics

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3

Spatial Distribution of Development and Poverty

Level of development or degree of poverty may vary considerably from place to place within a country, region or urban area. These spatial variations, which may have important implications for development activities, can be analyzed using the techniques described in this chapter. The analysis can be used to identify and investigate the richest and poorest regions in a country, districts in a region, or neighborhoods in an urbanized area. The income-poverty or development-underdevelopment dimensions may be defined in a variety of ways depending on the focus of the study. For example, the analysis may concentrate on income, health, nutrition, education, housing or availability of essential services. Several of these dimensions of development may be combined to form an overall index of development.

Analysis of the spatial distribution of poverty can be of particular importance to agencies attempting to formulate development interventions which reach poverty groups. Methods can be used to identify regions, provinces, or urban neighborhoods with the highest and lowest levels of poverty. For each area a determination can be made of "how many people are poor" and "how poor they are." Investigations of the spatial distribution of poverty can be used to describe specific areas for the more intensive micro socioeconomic analyses described in Chapter Four.

Poverty normally is identified by comparing the requirements needed for a basic standard of living with the ability of people to acquire these basic needs. The general approach taken here involves a comparison between income levels, which can be adjusted to include nonmonetary income, and a poverty line. The latter is based on the cost of essentials, such as food and shelter, and may vary considerably from place to place. An alternative shortcut approach is to estimate the distribution of poverty from the percentage of the population below some arbitrarily established minimum standard of education, housing, or employment status. An advantage of this shortcut method is that it can be used to identify quickly the locations of the poorest people in an area. Its disadvantages are adjusting the arbitrary minimum standard to meet local conditions and finding readily available indicators which realistically reflect poverty.

RELEVANCE TO DEVELOPMENT INTERVENTIONS

Methods described in this chapter can contribute to development interventions by supplying important background or identifying specific problems such as areas which exhibit extreme underdevelopment. Such information may contribute to the identification of new project opportunities or the redirection of existing programs. For example, analysis may reveal certain districts with very high infant mortality rates. This discovery may point to the need for additional health activities in these districts.

In addition to providing insights about the appropriate development activities for specific areas, the analysis may be helpful in selecting suitable locations for particular development activities. Location can be a key factor in the success or failure of a project design. To determine the "best" or even an "acceptable" location requires background information on the characteristics of different areas within the country. Techniques in this chapter can provide this type of information at various geographic scales.

TYPICAL QUESTIONS

- o What regions, districts, or cities have the highest or lowest levels of development? Which areas have the highest rates of infant mortality and illiteracy? Which areas have the lowest school enrollment ratios, life expectancies, and doctor-to-population ratios?
- o Which areas have highest or lowest per capita incomes? Which districts have per capita incomes less than \$200 or less than fifty percent of the national average?
- o What is the incidence of poverty in the country, in each region, district and neighborhood? How far below the poverty line are the poor people in each of these areas? What is the difference in the incidence of poverty between rural areas and urban areas? What towns and cities have the highest incidences of poverty?
- o What are the characteristics of the poor? What is their employment, education, housing, and sanitary situation? Do they have adequate access to essential services?

DATA SOURCES

Development Indicators

National censuses are the most readily available and often most appropriate sources of data because they cover all areas of the country at a high degree of spatial detail. Most third world countries conduct regular censuses and the quality of data is improving. Unfortunately, censuses usually are taken only once a

decade and it can take several years to complete, edit, and publish the data. Consequently information from the latest census is often out of date. However, sometimes census data can be obtained directly from national census offices before publication.

In most cases, censuses provide data on the spatial distribution of a variety of development indicators. Examples include employment in different industries and occupations, levels of education and literacy, migration status, housing characteristics, and possession of radios, refrigerators, televisions, and vehicles. These data can be used to make comparisons between different regions or between urban and rural areas. District and provincial information also is available with most censuses and in many cases municipality and enumeration area data can be obtained.

New data processing systems now enable several developing countries to provide census information in a wide variety of forms. The required computer software (CENTS and COCENTS) was developed by the International Statistical Program Center (ISPC) of the U.S. Bureau of Census.¹ With this software, tables can be provided to address specific analytical questions. For example, the Costa Rican Statistics and Census Office fulfilled a request in two days for a table showing the distribution of the economically active population, by major occupational categories, by five-year age intervals, by sex, by urban and rural residence for each district, region, and province. The new data processing systems can be used to develop compound indices of development and/or poverty. An example might be percentage of households in each neighborhood without electricity or piped water and headed by persons with less than five years of formal education.

The compound index which has received the most attention is the Physical Quality of Life Index or PQLI.² The PQLI was developed because the traditional measure of economic development (per capita GNP) does not provide adequate information about the life characteristics of individuals in third world countries. The PQLI is based on three carefully selected indicators, adult literacy, infant mortality, and life expectancy at age one. Each indicator is scaled so that values range from 0 to 100 and the scaled values are averaged so that theoretically PQLI values vary from 0 to 100.³ Changes in PQLI often are measured by the Disparity Reduction Rate which is the rate of decrease between an actual PQLI and the highest possible PQLI of 100. Although some scholars have criticized the PQLI, it is perhaps the best of the well-known indicators representing the quality of life of populations in third world countries.

Poverty Line Data

Analyses of spatial variations in poverty often are based on income distribution and poverty line data. Income distribution data may be available from censuses or surveys of household incomes and expenditure patterns. These are particularly useful because they contain information on both income variations and poverty

trends. Much of the data from income distribution surveys are described and tabulated in World Bank publications.⁴

Appropriate data for developing a poverty line can be difficult to obtain. Most poverty lines are based on the assumption that nutritional deficit is the most basic dimension of poverty. Data are needed on household consumption and dietary patterns, nutritional needs and levels, and costs of locally available staple foods which meet minimum dietary needs. Information concerning household consumption and dietary patterns is perhaps the most difficult to obtain. If appropriate survey data are not available, the analyst must use whatever relevant information can be found and experienced judgement. Descriptions of nutritional needs can be obtained from Ministries of Agriculture or Health, World Health Organization, U. N. Food and Agriculture Organization, or research organizations. Prices of staple foods may be sought from a variety of sources including Ministries of Agriculture or Commerce, price control commissions, statistical offices, and food marketing boards. As a shortcut approach, poverty lines developed by other agencies can be used.

Information on the spatial distribution of poverty in urban areas can be collected efficiently using aerial photography. Air photos indicate the location, size, and density of urban neighborhoods and provide insights concerning housing quality.

ANALYSIS OF DATA

Use of Maps

One of the easiest and most useful ways to assess the spatial distribution of development is to map the data. A map of development patterns offers a very concise and understandable profile. It can indicate which subareas have highest and lowest levels with respect to income level or some other variable of interest. Maps can be made by selecting about five or six ranges of the variable of interest such that each range contains approximately the same number of subareas. For instance, a development map of a country containing forty provinces might have five development levels each containing eight provinces. Examples of development maps are provided in Chapter Twelve, Panama Case Study.

Relationships Between Development Indicators

Spatial associations between development indicators may be investigated using maps or statistical techniques. Comparisons of maps representing different dimensions of development may reveal relationships between different aspects of development or between development indicators and other characteristics. For example, a comparison of maps may show that areas with high levels of consumption of certain food types have surprisingly low incidence of some diseases. Closer scrutiny may uncover the reasons for this relationship and these, in turn, may be instructive in designing health or nutrition projects in other areas.

Comparisons of spatial distributions can also be accomplished using correlation and regression techniques. Correlation coefficients indicate the strength of the relationship between two development indicators. Regression can be used to estimate the spatial distribution of an indicator of interest from data on a related indicator. Correlation and regression techniques are described in basic statistics textbooks. Data on spatial distributions also can be used in principle components analysis or the more general factor analysis.⁵ These rather complicated techniques efficiently group variables into general factors which provide summary measures of the original data. The factors can be mapped to reveal the spatial distribution of basic components of development. Components analysis was used in the Panama case study described in Chapter Twelve.

Poverty Line Analysis

Studies by the World Bank demonstrate relatively simple quantitative techniques for analyzing the spatial distribution of poverty.⁶ The techniques are based on spatial variations in poverty lines, income distribution, and population. There are two basic approaches to specification of a poverty line: relative and absolute. A relative poverty line is defined arbitrarily as some portion of per capita or per household income. For example, a relative poverty line in a country might be defined as one-third of the national per capita income. This simple approach has one serious drawback; it usually overlooks regional differences in the cost of meeting basic needs. Consequently, it leads to overstatements of the differences between urban and rural poverty because price indices are considerably higher in urban areas. For example, in Peru, 69 percent of households in Rural Sierra and only 8.5 percent in Urban Coast had incomes below 3333 soles (about one-third of the national per capita income in 1971).⁷ A more detailed and realistic analysis based on absolute poverty lines showed that 41 percent of households in Rural Sierra and 12.3 percent in Urban Coast were poor.⁸ The relative poverty approach is solely a function of the relative income distribution and not related to the cost of basic needs. Based on this measure there would be no poverty in a country in which all persons had incomes of \$100 per year because no people would have incomes of less than \$33 (assuming the relative poverty line was one-third the national per capita income). Though the relative poverty approach has limitations, it does provide a quick means of specifying a poverty line. The Panama case study, Chapter Twelve in this volume, demonstrates a modification of this approach.

Though it requires considerably more work, the absolute poverty line is felt by many to be superior to the relative version. The former is based on the cost of basic needs in various regions of the country. Food is the most crucial of these; thus most analyses start with the cost of locally produced foods which meet minimum nutritional and dietary needs. A standard food basket is specified and data are collected on its cost in different areas within the country. The standard food basket can be adjusted

because some foods are unavailable or unpopular in certain parts of the country. The composition also might be altered for variations in calorie requirements for different climate and altitude environments.

To specify the absolute poverty line, basic food costs must be added to the costs of essential nonfood needs such as clothing, housing, and transport. Nonfood needs in different areas are difficult to compare. The most common approach uses actual nonfood expenditures of poor people in various regions. A shortcut method is to assume a standard ratio of nonfood to food costs. However, this approach leads to over-estimates of differences between urban and rural poverty because basic nonfood costs in cities are higher than those in rural areas. For example, basic nonfood costs in Lima were almost three times as high as comparative costs in Rural Sierra.⁹ If the nonfood to food ratio method is used, ratios should be adjusted for community size. Available information suggests that these vary from about 1.5 to 1.0 for the largest cities and .5 to 1.0 for rural areas. After nonfood costs are estimated, they are added to food costs to obtain the absolute poverty line. In general, big city absolute poverty lines are between twenty percent and sixty percent higher than those in rural areas. The Costa Rica case study described in Chapter Thirteen demonstrates use of absolute poverty lines.

Poverty line analysis has been criticized because it usually relies on a single poverty line. This line divides the population into two dichotomous groups, "poor" and "not poor." In reality, income is distributed continuously from the very poor to the very rich. There are degrees of poverty which are overlooked with the use of a single line. To avoid this criticism, several different poverty lines can be developed, for example: slight poverty -- \$250 per capita, poverty -- \$200, severe poverty -- \$150, and extreme poverty -- \$100.

Poverty lines for each area can be compared to incomes to determine poverty incidence, *i.e.*, the percentage of people below the poverty line. Data on income distribution normally are obtained from household employment, budget, or expenditure surveys. Such data can be adjusted to account for home consumption of farm products, survey unit (whether families, individuals, or adult equivalents),¹⁰ and time period of survey (some surveys cover only a one-week period and therefore misrepresent the income of seasonal employees). Although numerous surveys have been conducted, survey data generally are not available for all areas of a country.

In the absence of a complete survey, income distribution for each area can be estimated from whatever data are available. Censuses may be used if they report income distribution data or an appropriate surrogate such as family expenditures. Alternatively, the shape of the income distribution curves for urban and rural areas reported by Jain¹¹ may be assumed to apply for all urban and rural areas respectively. In this case, gross income estimates for each area may be used to calculate income distribution.

As an illustration, suppose the poverty line was \$200 per capita and income distribution data revealed that forty percent of

the people had incomes below this level. By multiplying this forty percent figure by the size of the population, the actual number of poor people in the area can be estimated. The income distribution data then may be used to determine the mean income of poor people. The difference between this mean and the poverty line, the Sen index,¹² is a measure of the severity of poverty. This can be multiplied by the number of poor people to determine the poverty gap or amount of income needed per year by the poor to raise all of them to the poverty line.

Poverty Analysis Using Census Data

If poverty can be defined in terms of census variables, then census data can be used to analyze the spatial distribution of poverty. For example, if the census provides information on occupations, the poverty rate might be defined as the percentage of the economically active population unemployed or employed in unskilled occupations. Other census poverty indicators might include percentage of adults without formal education, overcrowded housing, or lack of piped water or electricity. Although these measures are simplistic, they do provide a rough estimate of the distribution of poverty among individual regions, districts, urban areas, and individual urban neighborhoods.

If country census offices have appropriate data processing facilities, multidimensional definitions of poverty may be specified. For example, census data can be used to define the poverty rate as the percentage of adults with less than five years of formal education who are either unemployed or in unskilled occupations. Such multidimensional definitions provide a more accurate measure of poverty than unidimensional indicators.

SOURCES OF FURTHER INFORMATION

- * Jain, Shail. Size Distribution of Income: A Compilation of Data (Washington, D. C.: IBRD, 1975, 137 pp.). A very comprehensive source of data on income distribution in third world countries. Income shares received by each decile of the population are estimated for eighty-one countries. Coverage within countries is broken down by rural, urban, agricultural and nonagricultural.
- * Kipnis, Julio. "Size Distribution of Income: Bibliography of Basic Sources," World Bank Staff Working Paper No. 217 (Washington: IBRD, 1975, 58 pp.). All major data sources since 1962 for fifty-seven developing countries are listed.
- * Meesook, Oey Astra. "Income, Consumption and Poverty in Thailand, 1962/63 to 1975/76," World Bank Staff Working Paper No. 344 (Washington: IBRD, 1979, 97 pp.). Presents a detailed analysis of regional and urban-rural variations and changes in these over time. Relys on three household sample surveys and compares these to national income accounts.

- * Stohr, Walter. Regional Development Experiences and Prospects in Latin America (Hague: Mouton, 1975, 186 pp.). Chapter Three provides an indepth description and analysis of the spatial distribution of development within Latin American countries. Numerous maps, tables and indicators are provided.
 - * Thomas, Vinod. "The Measurement of Spatial Differences in Poverty: The Case of Peru," World Bank Staff Reprint Series No. 153 (Washington: IBRD, 1978). This excellent paper describes a variety of techniques and issues of poverty measurement including regional variations in food and nonfood components, consumer price indices, approaches to poverty line determination, under-reporting of income, data availability, and limitations of various approaches.
 - * Webb, Richard. "On the Statistical Mapping of Urban Poverty and Employment," World Bank Staff Working Paper No. 227 (Washington: IBRD, 1976, 53 pp.). Detailed procedures are described for mapping poverty from data on income distribution, poverty line and population. Data sources on the distribution and characteristics of poverty are presented.
- Datta, Gautam and Jacob Meerman. "Household Income or Household Income Per Capita in Welfare Comparisons," World Bank Staff Working Paper No. 378 (Washington: IBRD, 1980, 34 pp.). Compares the two welfare indicators and advocates the use of household income per capita.
- Fields, Gary S. Poverty, Inequality and Development (Cambridge: Cambridge University Press, 1980, 278 pp.). Provides a comprehensive discussion of income inequality and absolute poverty. Empirical relationships between these and economic growth are investigated.
- Frank, Charles R. Jr. and Richard C. Webb, eds. Income Distribution and Growth in Less-Developed Countries (Washington, D. C.: The Brookings Institution, 1978, 603 pp.). Very comprehensive review of income distribution and how it is influenced by policies of: industrialization, education, population, wage rates, fiscal policy, rural development, public works, nutrition and health care, and urban land use planning. Includes appendices on measuring various aspects of income distribution.
- Herrick, Bruce and Barclay Hudson. Urban Poverty and Economic Development: A Case Study of Costa Rica (New York: St. Martin's Press, 1981, 188 pp.). Presents a detailed analysis of poverty groups and neighborhoods in San Jose.
- Lipton, Michael. Why Poor People Stay Poor: Urban Bias in World Development (Cambridge, Mass.: Harvard University Press, 1977, 467 pp.). Provides theoretical explanations for urban-rural poverty gaps. Discusses policy alternatives.

Mohan, Rakesh. "The People of Bogota: Who They Are, What They Earn, Where They Live," World Bank Staff Working Paper No. 390 (Washington: IBRD, 1980, 153 pp.). Presents an interesting case study of intraurban spatial variations in population growth and density, income, workers, and employment opportunities.

Mohan, Rakesh, M. Wilhelm Wagner, and Jorge Garcia. "Measuring Urban Malnutrition and Poverty: A Case Study of Bogota and Cali, Colombia," World Bank Staff Working Paper No. 447 (Washington: IBRD, 1981, 80 pp.). Study clarifies conceptual and measurement problems concerning malnutrition and poverty. It analyzes spatial distribution of malnutrition.

Pfeffermann, Guy Pierre and Richard Webb. "The Distribution of Income in Brazil," World Bank Staff Working Paper No. 356 (Washington: IBRD, 1979, 116 pp.). Paper includes a review of urban-rural and regional differences in poverty measures and other development indicators.

Sen, Amartya. "Levels of Poverty: Policy and Change," World Bank Staff Working Paper No. 401 (Washington: IBRD, 1980, 91 pp.). Paper presents a good review of concepts and indicators of poverty and compares poverty reduction in a wide range of countries.

Soja, E. W. The Geography of Modernization in Kenya: A Spatial Analysis of Social and Economic Change (Syracuse, N.Y.: Syracuse University Press, 1968). The spatial distribution of several development characteristics are analyzed separately and then combined in a factor analysis.

Soja, E. W. and R. J. Tobin. "The Geography of Modernization: Paths, Patterns and Processes of Spatial Change in Developing Countries," In G. D. Brewer and R. O. Brunner, eds., Political Development and Change (New York: Free Press, 1975, pp. 197-243). Theories related to the spatial distribution of development are reviewed. A detailed case study is provided of spatial development in Sierra Leone between the 1920's and the 1960's.

van Ginneken, Wouter. Rural and Urban Income Inequalities in Indonesia, Mexico, Pakistan, Tanzania and Tunisia (Geneva: ILO, 1976, 67 pp.) Selected sample survey data are used to analyze income inequalities within urban areas, within rural areas, and between urban and rural areas.

* Particularly useful sources of further information.

NOTES

1. U.S. Bureau of the Census, - CENTS-II: Tabulation System, Series ISPC 4, No. 3 (Washington, D. C., 1975). U.S. Bureau of the Census, COCENTS: COBAL Tabulation System, Series ISPC 4, No. 2 (Washington, D. C., 1976).
2. Morris David Morris, Measuring the Condition of the World's Poor: The Physical Quality of Life Index, Published for the Overseas Development Council (New York: Pergamon Press, 1979).
3. Literacy scale equals percentage of population over age fifteen who are literate. Infant mortality scale equals $(229 - \text{infant mortality})/2.22$. Life expectancy scale equals $(\text{life expectancy at age one} - 38)/0.39$.
4. Julio Kipnis, "Size Distribution of Income: Bibliography of Basic Sources," World Bank Staff Working Paper No. 217 (Washington: IBRD, 1975). Shail Jain, Size Distribution of Income: A Compilation of Data (Washington: IBRD, 1975).
5. R. J. Rummell, Applied Factor Analysis (Evanston, Ill.: Northwestern University Press, 1970).
6. Richard Webb, "On the Statistical Mapping of Urban Poverty and Employment," World Bank Staff Working Paper No. 227 (Washington: IBRD, 1976). Vinod Thomas, "The Measurement of Spatial Differences in Poverty: The Case of Peru," World Bank Staff Working Paper No. 273 (Washington: IBRD, 1978).
7. Thomas (See note 6 above) p. 111.
8. Ibid, p. 61.
9. Ibid, p. 48.
10. An "adult equivalent" is the amount generally consumed by an adult. A child may count as half an adult; a four-person family may count as three "adult equivalents."
11. Jain (See note 6 above).
12. A. K. Sen, "Poverty, Inequality and Unemployment: Some Conceptual Issues in Measurement," Economic and Political Weekly, Special Number 1973, pp. 1457-1465.

4

Micro Analysis of Beneficiary Groups

This chapter discusses methods for investigating the micro socioeconomic characteristics of beneficiary groups. In the previous chapter techniques were presented for identifying these groups. Micro analysis is a very broad field practiced by a variety of social sciences including anthropology, economics, geography, political science, and sociology. Most micro analysis is motivated by the academic goal of better understanding and improved theory of social and cultural processes. Some studies by anthropologists systematically avoid situations related to development; these studies focus on societies which have not been "contaminated" by externally induced development processes. Other researchers specifically concentrate on the causes of poverty in third world areas. For example, Foster suggests that peasants' perspectives on development are based on the idea of a "limited good." *i.e.*, the quantity of the desired things in life (land, wealth, etc.) is finite and in short supply and it is beyond the peasant's power to increase the quantity.¹ Oscar Lewis suggests that there is a "culture of poverty" from which peasants cannot escape.² Others suggest that traditional populations cannot develop because they do not have the appropriate attitudes or need for achievement.³ These theories, which are no longer widely accepted, do relatively little to provide agencies with the type of information needed for successful interventions. This chapter is limited to that portion of micro analysis which can provide development agencies with useful information.

Several types of information from micro analysis can be utilized in development interventions. Descriptive studies of the characteristics of target beneficiary groups provide background on local behavior patterns, decision making frameworks, and development priorities. This information can be useful either to identify appropriate projects for given areas and to find suitable areas for given development activities. After interventions are selected, analysis can provide the information needed to tailor the project design to the local situation. When preliminary designs are completed, social impact analysis can be employed to investigate the social soundness of the project and to assess its

impacts on the target community. The project then can be adjusted to improve its fit with the local environment. After project implementation, evaluation studies can assess the experience and identify lessons for improving the design of similar activities in other areas.

The different types of micro analysis relevant to development activities may take a variety of forms and levels of effort. The first and easiest step in conducting a micro analysis, is a review of existing studies of relevant beneficiary groups. Though this type of "armchair" analysis may provide a wealth of information with minimal effort, it cannot replace actual field work. The amount of field work needed varies from situation to situation. While it often is limited to field observations and discussions with local leaders or other rapid appraisal techniques, it may require extensive interviewing and numerous, long duration visits to the field. The focus of the study may be on the local community as a whole or on selected groups which are relevant to specific projects, for example, youth, womens, or elderly.

RELEVANCE TO DEVELOPMENT INTERVENTIONS

Local Participation

A number of recent studies of development projects indicate that local participation is a very important factor in project success.⁴ A key aspect of participation is local action represented by involvement in project implementation decision making and commitment of labor and cash to the project.⁵ Micro analysis can contribute to local participation in a number of ways. Background investigations of beneficiary groups can provide useful information on a variety of social and economic characteristics. Analysis can be undertaken of local perceptions of development problems, needs, and priorities. Community capacity to meet those needs and solve problems can be studied. Micro analysis can contribute to all phases of development activities from identification through final evaluation.

Identification of Development Interventions

Studies of local communities may suggest a number of alternative development interventions which are consistent with local desires and therefore potentially can gain enthusiastic local support. This approach to project identification is generally superior to others based on development agency assumptions concerning the needs and desires of beneficiary groups. Too often interventions identified by agencies are of little or no priority to local populations. For example, a government program in India provided improved seed at fair prices; however, few farmers bought the seed because it was considered a disgrace and sign of failure to be forced to buy or borrow seed.⁶ Farmers took special pride in being able to raise enough food to maintain their families and have enough extra to use as seed.

Project Design

After appropriate interventions are identified, continued analysis along with communication with local groups can provide information useful for project design. Before this can occur, additional studies may be required on specific aspects of the project. For example, in designing health care delivery projects additional investigations might be made of traditional health care and local attitudes and beliefs concerning health. Designs may build on local programs, organizations, and resources; thus minimizing the disruptive effects of the project. The key is to design projects which meet local needs, utilize local organizations and resources, and make intuitive sense to that community.

The design phase can be conducted in three possible ways. First, members or leaders of the local population can be included in the design team. Though this approach may take longer, chances are greater for effective communication between agency personnel and the local population. Consequently the probability is enhanced for compatibility between the project design and the local socioeconomic environment. Second, the design team can consult frequently with local representatives and leaders to explain the design and obtain relevant feedback. With this approach, efforts should be made to keep communication channels open and effective. The local population can be given sufficient control over the design so that they feel that the project is "theirs" and are willing to participate actively. Third, the design team can work independently from the local community. This approach can result in project designs which are incompatible with local characteristics. For example, the Mexican government designed and built numerous central hot water laundry facilities so that women would not have to carry clothes to cold streams and wash under uncomfortable conditions. Women were very reluctant to use the facilities, however, because the wash tubs faced the walls; they felt that facing the wall was punishment because children were made to do this when they misbehaved in school. In addition, the tub placement made conversation, an important social function connected with washing, very difficult. Consequently, the tubs had to be moved away from the walls.⁷ If the design team had conducted more thorough micro analysis and communicated more effectively with the local population, this situation might have been avoided.

Social Soundness Analysis

An analysis of the social soundness of a completed project design addresses four related elements:

1. The compatibility of the project with the sociocultural environment in which it is to be introduced (its sociocultural feasibility);
2. The likelihood that the new practices introduced among the initial project target population will be diffused among other groups (i.e., the spread effect);

3. The social impact or distribution of benefits and burdens among different groups, both within the initial project population and beyond.⁸
4. The changes or alternatives needed in the project design to enhance its sociocultural feasibility, spread effect, and positive social impact.

Project Implementation

If appropriate micro analysis has been conducted and local groups have been involved closely in project identification and design, then chances of enthusiastic local participation in project implementation are improved. If possible, beneficiary groups should be involved in making implementation arrangements and decisions. In addition, effort should be made to utilize local organizations and resources for implementation.

Project Evaluation

Micro analysis usually is needed to evaluate the impacts of development projects. Micro level evaluations normally compare the baseline preproject socioeconomic situation with project target objectives and postproject results. The evaluation can indicate whether or not a project achieved its target and if not, what factors are responsible for lack of success. Evaluations may provide useful information for the design and implementation of future activities.

TYPICAL QUESTIONS

- o What are the micro socioeconomic characteristics of beneficiary groups? What are their basic needs? How are these currently being satisfied? What contacts exist with individuals and organizations beyond the local community?
- o What are the goals and aspirations of beneficiary groups? How do they expect to achieve these? What motivates them? What do they perceive as their greatest development needs and most crucial problems? What are they currently doing to achieve these needs and solve these problems? What do they need to implement their solutions?
- o What are local ideas and attitudes concerning development? Government? Equity? Human Rights? Personal Dignity? Status? Prestige? Trust?
- o What are sources of income? What are local consumption, saving, and borrowing patterns? What mechanisms are used to overcome periods of low or no income?

- o What are community human and nonhuman resources? Are these being utilized effectively to meet local needs? What would it take to utilize more effectively community human resources?
- o What conflicts exist within the local community? Between the community and outside individuals and organizations? How do these conflicts affect behavior patterns and development activities?
- o What are the purposes and activities of formal and nonformal local organizations? What are the interrelationships between these organizations? How are they connected to larger and national organizations? Where do they obtain funds? What community needs do they satisfy? What are the characteristics of their leaders? What have been their successes and failures? What new activities are they planning? What additional resources do they need?
- o Is the proposed development project compatible with the local socioeconomic environment? What are the specific characteristics of the individuals and groups expected to participate in the proposed project? Will they be willing to commit their time and financial resources to the project? Which groups are not expected to participate? What is the probability that the approach used in the proposed project will be adopted by other groups in other areas?

DATA SOURCES

Data, both quantitative and qualitative, are perhaps the most important element of micro analysis; however, they are difficult to obtain. Although censuses may provide some basic data, they generally do not contain detailed information on such important characteristics as basic needs, development priorities, behavior patterns, or local leaders and organizations. Collection of this type of information normally requires field work which can be time consuming and expensive. Before undertaking extensive field work, thorough efforts should be made to obtain as much information as possible from existing studies.

Data from Previous Studies

Anthropologists and other social scientists have conducted numerous micro studies based on extensive field work. In the past, anthropologists have focused primarily on rural communities; however, urban study areas are becoming more popular. Sociologists and other scholars using survey research techniques have collected and analyzed a considerable amount of data. Political scientists

have contributed a number of useful studies on the functions and dynamics of local organizations and their leaders.

Researchers at social science departments of national and other universities are a good source of information concerning existing research. National ministries, research organizations, and development agencies are also a good source. Occasionally, useful information on micro characteristics of target groups can be obtained from novels, diaries, and other literary sources. Because they are readily available, existing studies provide a logical starting point for the collection of information on micro characteristics. They can be impressionistic, however, and reflect the biases and perceptions of the original researcher. For this reason, analysts should use caution.

Short Field Visits

The most common type of field work practiced by development agencies is the short field visit. Such visits, which may be as short as an afternoon or long as a week, provide first hand impressions of the micro characteristics of target communities. Such impressions may be useful in the design of more detailed data collection efforts. At the very least, short field visits enable analysts to observe directly the living conditions in the area. Conversations with residents are desirable because they provide information which cannot be observed. Often local leaders can articulate problems and needs as well as past efforts to address these. Short field visits are relatively quick, easy, inexpensive, and supply first hand impressions and basic information. However, the information gained may be superficial and misleading.

Because the short field visit is so commonly used and abused, it has received considerable criticism in recent years. It is useful to discuss these criticisms in some detail so that the problems and biases of short field visits can be avoided in the future. Perhaps the most articulate critic is Robert Chambers who has focused on the biases of using short field visits as a means to understanding the micro socioeconomic characteristics of poverty groups in rural areas.⁹ He has labeled such visits "rural development tourism" and has identified several methods of overcoming the biases. The views of Chambers, which are used as the basis for the discussion below, are relevant also to urban field visits and those without an explicit focus on poverty groups.

Spatial Biases. Teams conducting short field visits rarely see areas beyond the road network because cars and vans are their primary means of transport. While this is primarily a problem with rural studies, it also applies to urban areas because most parts of shanty towns are not accessible to large motor vehicles. Due to time limitations and concerns for comfort, dirt roads often are avoided in favor of pavement. Lodging is also a concern; teams rarely visit places more than a half day drive from a decent place to spend the night. Due to these spatial biases, areas near urban centers and major roads are more often visited than more remote

areas which are normally less developed and may have differing socioeconomic characteristics.

To overcome spatial biases, analysts must be willing to abandon automobiles and the comforts of large hotels. Dedicated individuals often must insist on overcoming this bias and not be held back by those who would rather be comfortable than obtain a better understanding of beneficiary groups.

Project Bias. Those who arrange short field visits are more apt to put project areas on the itinerary rather than areas without projects. Most often successful projects or showpiece areas are visited. Since many groups visit such areas, local project managers may end up spending more time with public relations than with promoting development. As an example of a showpiece, I recently was taken to visit a small farm where I was asked to sign a guestbook which included the names of the current Minister of Agriculture and a former Administrator of the U. S. Agency for International Development. Obviously, project locations and showpiece areas are not representative and may contribute to false impressions.

While hosts usually take field teams to their showpiece activities, the project bias can be overcome by insisting that representative, nonproject areas be visited. Such insistence can be defended by utilizing a sampling procedure to select the places to be visited.

Person Biases. In general, teams do not interact with a representative group of individuals from the community being visited. Those who are contacted tend to be elites, males, users of schools, agricultural extension, and other public services, adopters of new technologies, and those who are active. In contrast, conversations are less likely with the poorest residents, females, those who don't use public services nor adopt new methods, and people who are sick or naturally passive. Due to person biases visitors often get a relatively optimistic impression of the socioeconomic conditions in the area.

Overcoming person biases are not easy. Protocol often dictates that initial conversations be held with local elites and officials. Analysts may have to spend additional time in the area asking questions about and deliberately seeking out poorer people, women, the sick, nonadopters, and others.

Dry Season and Daytime Biases. Due to impassible roads and considerations for comfort, short field visits usually are made during the dry season. This results in relatively positive impressions because in many tropical areas the wet season is the most difficult. It is the time when food is short, food prices are high, work is hard, infections are prevalent, and malnutrition, morbidity, and mortality rates are all up. Due to the advantages of natural light and the normal work pattern of study teams, most field observations are made during daylight hours. However, many important socioeconomic activities take place after or before

daylight. These activities, which may be particularly important in urban neighborhoods, often are overlooked.

Dry season and daytime biases can be overcome by foregoing comfort and scheduling field visits at off times.

Politeness and Timidity Biases. Courtesy, convention, and cowardice may deter visitors from asking probing questions about poverty, failing programs, or other sensitive topics. While notables generously offer hospitality to study teams, they may be unwilling to answer sensitive questions.

These biases are easily overcome. Even at the risk of offending people, visitors should make clear what information is sought and have the courage needed to ask probing and sensitive questions.

Professional Biases. Professional specialization, despite all its advantages, makes it difficult to see the holism of the community being visited. Professionals are programmed by their education and experience to see the world through blinders; they tend to look for and see what fits into their specific academic paradigm.

Professional biases can be overcome by individual professionals reading and discussing topics beyond their area of expertise. Field investigation teams should be multidisciplinary and member interaction strongly encouraged.

Entourage Bias. The size of the group making a short field visit may grow to involve ten to twenty people and several vehicles. Complications, protocol, and opportunities for delay tend to increase geometrically with the size of the team. The arrival of a large group especially those containing high level officials is perceived as a major event in the community being visited. Receptions are held, speeches are made, banquets are served, and entertainment is arranged. All of these activities are detrimental to the trip purpose of obtaining accurate information on the socioeconomic characteristics of the community.

To avoid the entourage bias, keep group size to a minimum and be unimportant. Efforts should be made to discourage those who are just "going along for the ride." It is often a good idea to divide the team so that visits are made by single individuals or pairs. Try to be as unimportant as possible, thus minimizing protocol. This may be accomplished by avoiding conspicuous vehicles and arriving by public transport or on foot, by making unscheduled visits, and by avoiding the impression of having any influence over benefits which the community might receive.

Other Suggestions for Overcoming Biases. Most of the biases discussed above can be overcome by spending more time in the community. With more time, visitors can fulfill protocol requirements and still have time to talk with more representative members of the community. Time allows one to become familiar with the community; to establish a modicum of trust; to meet with the

poor, the sick, and the passive; and to probe sensitive issues. If possible, one should spend a few days and nights.

The analyst should learn to listen carefully and learn as much as possible from local residents. Some development professionals feel there is nothing to learn from locals. This attitude greatly hinders their understanding of the local socioeconomic situation. Questions should be open-ended and elaboration encouraged. Often free flowing discussion may lead to valuable issues and insights which the analyst had not considered previously. Such discussions can reveal indigenous technical knowledge which often is more relevant to community development problems than the academic knowledge of so-called experts.

Interaction with Community Leaders and Local Organizations¹⁰

In many ways this method is similar to the short field visit; however, it usually implies periodic interaction over an extended period of time. A degree of familiarity and trust can be established which facilitates communication. When using this method, explicit efforts should be made to avoid the biases discussed in the preceding section.

Interaction with Local Leaders. This is a relatively easy technique for collection of information on local communities, especially information on local needs, problems, and community attempts to address these. Analysts can compile lists of local formal and informal leaders by identifying local organizations and listing their leaders or by simply asking local residents, school teachers, businessmen, etc.

The representativeness of identified leaders is an important consideration. Often leaders are of higher socioeconomic status than the general population; this may adversely affect their ability to accurately represent local development needs, priorities, and problems. Meetings with a wide variety of leaders may be required before suitable leaders are identified as appropriate spokespersons for their communities.

Interaction with leaders on a continuing basis can be educational for both analysts and leaders. Though leaders may be relatively informed on development issues, interaction can improve their knowledge of development processes and agency planning frameworks and procedures. The analyst can learn a great deal from the leaders about local socioeconomic characteristics and priorities. Working together, analysts and leaders can identify development interventions which are appropriate for local conditions. Close interaction can continue into the design, implementation, and evaluation phases of development activities.

Sometimes key informants are used in the collection of micro information. Key informants may be anyone in the community with whom the researcher establishes a good working rapport. The informants then communicate information on local needs, problems, and development issues. Additional information can be obtained by interviewing people who have been identified by key informants as

being particularly knowledgeable on certain subjects. Care must be taken to insure that the communicated information accurately represents the views of the community.

Communication with local leaders and/or key informants has a number of advantages. The method is easy, quick, relatively inexpensive, and results in fairly accurate information. Continued interaction can stimulate and encourage local development activity as well as increase local participation with agency development projects. The method is also flexible. Once an appropriate relationship is established, a wide variety of information can be communicated.

The primary disadvantage of this method is nonrepresentativeness of the persons contacted. They may indicate high priority for activities which benefit them individually or relatives or friends in similar socioeconomic positions. Periodic cross checks with other community members may reveal biases. The technique also runs the risk of strengthening nonrepresentative leaders such as traditional elites. A further disadvantage is the considerable demands put upon the valuable time of local leaders. Despite these weaknesses, interaction with local leaders is often the most appropriate technique for obtaining information on the functioning of the community socioeconomic system and the development needs and priorities of the residents.

Interaction with Local Organizations. Though similar to interaction with leaders, this approach focuses on communication with larger groups of people. This may involve meetings with any and all types of local organizations. Analysts may attend meetings of existing general or special purpose organizations or they may convene community meetings or public hearings to discuss local development problems.

Interaction with existing local organizations is perhaps the best approach for gaining relevant micro socioeconomic information and stimulating participation. These groups have experience in articulating and addressing the needs of the community. Organizations might include community development committees, neighborhood betterment associations, local councils, women's clubs, school-related groups, religious groups, businessmen's associations, co-operatives, and artisanal organizations. Interaction with such groups has a number of advantages. They are knowledgeable about local socioeconomic characteristics as well as local development needs, priorities, and problems. Such organizations usually are dedicated to bringing about meaningful change and may be able to motivate active participation on the part of the broader community. They also may be informed about broader development issues and constraints. Discussions with groups about specific problems sometimes can result in locally initiated self-help projects to alleviate the problems. Continuing communication is relatively easy to maintain and can be educational for both the analyst and the organization. Collection of information from community groups is flexible and relatively inexpensive in terms of time and money. The primary costs are for

identification and assessment of the local organizations and the actual time spent in communication.

The major limitation of this technique is the degree of representativeness of the organizations and their leaders. Sometimes considerable effort must be made to determine if they accurately represent the views of the general population. Obviously, the views of special interest groups such as artisan organizations cannot be taken as representative of the whole community. The outlook of the leaders should be checked by informal communication with members. Often dissenting opinions and other useful information can be obtained by asking about, seeking out, and talking to members who are known to disagree with decisions and may even be regarded as trouble makers. Another weakness concerns the establishment of trust and rapport with local organizations who may be suspicious of outsiders from national or international development agencies. In addition, the technique may require considerable time on the part of the organizations themselves. Despite limitations, this approach and its close affiliate, communication with local leaders, are often the most appropriate means of gaining needed information of local development opportunities.

Convening of Community Meetings. Sessions can be called to obtain information on key local problems as well as past and proposed attempts to solve them. The resulting information may be useful in identifying viable development projects. After preliminary project designs are drafted, public hearings can be convened to analyze and discuss the proposed plan. Such hearings may identify flaws in the plan which need to be corrected.

The convening of local public meetings has a number of strengths and weaknesses. The results are dependent upon the ability of the analyst to advertise and conduct the meetings properly. Because the analysts are in control, they can elicit the type of information needed to identify and design development projects. A variety of types of issues and problems can be discussed. If the meetings are advertised and conducted properly, a representative group can be assembled and the viewpoints of all can be heard. The sessions themselves may act to stimulate local discussion about needs and problems; this possibly may lead to local development initiatives.

Though this method has a number of advantages, it is very difficult to implement properly. Individuals responsible for convening and conducting the meetings must have community organization skills and knowledge of the local socioeconomic environment. The purpose and objectives of the meetings must be communicated clearly and carefully to the community. Proper advertising and organization may take considerable time and therefore limit the efficiency of this approach. Those who attend may remain passive and simply listen to what the analyst has to say. Alternatively, the viewpoints of only the more vociferous or aggressive may be heard. Despite these disadvantages, the

convening of local meetings may be the most appropriate approach in some situations.

An informal variant of the community meeting is the group interview. The interview is completed by assembling a group of local people who are considered to be knowledgeable about the local community. Members of the group can corroborate the statements of others, provide additional examples, make corrections and clarifications, as well as offer differing or even conflicting information. Group discussions may result which reveal problems and conflicts in the community. Group interviews in 860 Costa Rican communities were found to be very consistent with census data and other secondary sources of information.¹¹ The main problem with this method is selecting groups which are knowledgeable and representative. In addition, the accuracy of the information tends to decrease as the size of the community increases.

Surveys

Numerous surveys have been employed to collect information on the micro socioeconomic characteristics of target communities. Generally, information is collected from individuals selected systematically using sampling procedures. The sample can be designed to include subsets of the local community such as youth, women, local leaders, or poor people. The mechanism used to collect the data, the survey instrument, may take many forms. It may be a questionnaire which is either mailed or distributed to individuals in the sample. Questionnaires may include "open-ended" or "close-ended" items. The former often is preferred because it allows sampled individuals to choose their response freely. Close-ended items restrict choice to a set of prespecified responses. Case histories of individuals in the sample may be requested. The instrument may be an "interview schedule," *i.e.*, a set of questions posed in a conversational mode. It can include attitudinal items which ask individuals about their agreement with selected statements. Some surveys even may include projective tests, such as thematic apperception or Rorschach, which are designed to elicit information on hidden feelings and values.

Surveys have a number of strengths and weaknesses.¹² They can provide detailed data on a relatively large number of individuals. If proper sampling procedures are used, the data are representative of the total population from which the sample was drawn. The analyst can select the survey items, therefore, data can be collected which are directly relevant to development activities. Though survey sampling and questionnaire design require considerable expertise and prior knowledge of the target group, the survey itself can be conducted by trained paraprofessionals (often students).

A major weakness of surveys is that they can result in superficial data which do not capture adequately the true development needs or priorities of the target community. Poor design of the instrument is often a problem. Some questionnaires are culturally biased and perceived differently by the analyst and

the surveyed individuals. For example, a questionnaire item might read, "Would you rather have a health clinic or electrical generator in your area?" The respondent may not understand the full implications of electricity, may associate a health clinic with illness and possibly death, or may attempt to guess which answer is "correct" instead of expressing true feelings. Other factors contributing to poor survey data include improper sampling, incapable or poorly trained survey workers, and untruthful responses by surveyed individuals.

Another weakness is that it takes a considerable amount of time and money to plan, design, and implement a survey properly. Design of the survey instrument usually requires prior knowledge of the community and thorough pretesting. Training of survey workers takes time as does actual surveying and analysis of the resulting data. Surveys also suffer from being inflexible once the actual data collection work has been initiated. In general, surveys do not stimulate community discussion about development problems. They therefore, do little to encourage local solutions to these problems or to promote active participation in development projects. Furthermore, they consume a considerable amount of the time of surveyed individuals. This time is a real cost which should be considered when evaluating the efficiency of conducting a survey. Despite these weaknesses, surveys are sometimes the most appropriate means of collecting information on the micro characteristics of beneficiary groups, especially large groups. When this is not the case, other data collection techniques may be more appropriate.

Participant Observation. This field work technique is used primarily by anthropologists. It generally requires total immersion in the community under study. The researcher normally learns the local language, lives in the area under study, and develops close associations with the local population. In short, he or she becomes a "participant" in the community and "observes" the sociocultural characteristics of the people.

The technique has a number of advantages and disadvantages. It provides a wealth of in-depth information of local attitudes, behaviors, and social organization. The technique is flexible; once the researcher is established in the community, he or she easily can adjust the method to suit local conditions. Participant observation may be used in combination with other techniques such as surveys, interviews with local leaders, group meetings, etc. On the other hand, it has some drawbacks. As normally practiced by anthropologists, the technique requires a long time, sometimes even years. It can take several weeks, even months, for the investigator to become accepted in the community. In some cases this acceptance is never gained and the researcher cannot develop a workable rapport with the local population. If the investigator overcomes this problem and remains in the community, emotional attachments may develop. These can influence the kinds of data collected, their validity, and their interpretation. In addition, participant observation only provides information for small groups

of people, which may not be representative of the larger groups identified for development interventions. Though participant observation, as generally practiced by anthropologists, is not normally appropriate for development agencies, it is important because many existing studies are based on this approach.

Modified participant observation may be appropriate for selected development efforts. For example, trained workers sometimes are sent to rural communities to help identify and solve development problems. Such workers gain a first hand knowledge of local social characteristics and this information can be used in developing subsequent development activities. Another interesting example is the case of a researcher in Peru who for short periods of time hired himself out to farmers on the condition that they would teach him their farming methods.¹³ The scheme worked very well and a great deal of useful information was collected.

ANALYSIS OF DATA

A wide variety of techniques can be used to analyze data on the micro socioeconomic characteristics of beneficiary groups. The information from existing studies as well as from field investigations may be descriptive and anecdotal. These are not easily amenable to structured quantitative analysis; often "soft" analytical methods must be used. There is relatively limited published information or manuals on these soft methods which rely to a large extent on experience, intuitive judgement, and common sense. This section provides some guidance to soft methods and outlines some of the more structured approaches relevant to micro analysis.

Integration of Information from Previous Studies

Micro analysis often starts with the collection and synthesis of available macro level information on the broad context of the local community. Analyses described in other chapters can be used to gain this contextual understanding; however, they need not be undertaken before micro analysis can begin. If results of macro studies are available, they should be utilized. If not, micro studies can be undertaken using whatever background information is handy.

After information on the broader context of the local community is scrutinized and analyzed, efforts can be made to relate this information to previous micro studies of target beneficiaries. At this stage linkages between the macro and micro levels can be identified and described. For example, macro data indicating the size and direction of overall migration flows can be compared with micro information on the factors influencing migration decisions. Occasionally, data at the two levels will be inconsistent. For example, macro studies may suggest that urban migration flows are permanent and linked to a desire for urban services and amenities. However, micro level surveys may indicate that migrants move to cities for only a short time to make enough

money to finance activities in their home village such as getting married, building a house, or sending a child to secondary school. When such inconsistencies are identified, attempts can be made to resolve them by more carefully scrutinizing the assumptions and procedures employed at both levels. If the inconsistencies are crucial to development efforts, field work often will be needed to resolve them.

The discussion so far has focused on information from existing macro and micro sources. The importance of searching out and utilizing this information cannot be overemphasized. The rest of this section concentrates on methods of analyzing field data. Three basic types of procedures are relevant to this effort; descriptive techniques, impact analysis, and evaluation studies.

Descriptive Techniques

Descriptive techniques can provide an understanding of the socioeconomic structure and processes of local communities as well as contribute to the identification of potential project opportunities. There are a variety of methods.

Community Case Histories. By describing the history of the community, current processes of change are put into proper perspective. This may be particularly useful in analysis of new urban neighborhoods experiencing relatively rapid change. The approach can also provide valuable information on the historical linkages between small settlements and activities in larger centers. Linkages of interest may include economic, social, political or physical interactions. Historical analysis can reveal the external sources of change in a community and the factors which influence these. Internal factors which have initiated or influenced change may be investigated also. Historical factors often are still important and can be utilized in proposed development interventions.

Individual or Family Profiles. These include relevant information about individuals or family units and the factors which influence their well-being. A wide variety of information may be included such as family histories, incomes and expenditures, movement and travel characteristics, daily activity patterns, and interactions with local and non-local individuals and organizations. Information may be included also on goals and aspirations as well as plans to achieve these. Profiles may highlight key development problems or constraints. For example, a profile of an informal sector artisan may reveal that working capital is a key constraint; the artisan may not have enough money to purchase needed inputs such as leather or fabric. This may suggest that small scale credit programs are needed to overcome this constraint. Profiles can reveal information about local decision making and risk perception. Such information is often essential to the identification of development interventions which receive active local participation. Though they are sometimes difficult

and time consuming to construct, profiles and case histories are a useful tool in micro analysis. They have the added advantage of being in narrative form which facilitates empathy and understanding of decision-makers and others who utilize the information.

Classification. There are two basic approaches to classification; logical division and grouping. Logical division involves selection of relevant classes based on predetermined criteria. This approach requires prior knowledge and is "top down" because the classes are predetermined before the data are analyzed or even collected. An example, assuming that migration status is an important characteristic, is dividing households into migrant and nonmigrant groups. The grouping approach starts at the bottom and focuses on a large number of characteristics for each observation. The approach is inductive and the data are searched for regularities which form the basis for classes. For example, the collected data may indicate that certain households have a number of similar traits such as ethnicity, occupation, income level, and migration status. These households then are grouped together. It is not necessary that each member of a group have the exact same traits; only that they be roughly similar. The grouping approach is more difficult to implement and quantitative methods such as cluster, factor, and discriminant analyses have been developed to assist researchers. Though grouping is more difficult, it is often more appropriate for micro analysis because the influence of preconceived notions and biases are diminished.

Correlation Analysis.¹⁴ This technique generates indicators of the strength of a relationship between two characteristics or variables. For example a correlation analysis may show a close relationship between years of schooling and some measure of housing quality. Correlation coefficients reveal only associations; they do not necessarily indicate casual connections. To extend the example, the correlation coefficient does not mean that acquiring more schooling necessarily causes people to have better housing nor that better housing causes people to acquire more schooling. Analysts should be aware of possible spurious correlations which are correlations between variables for which there is no causal link. Though correlation analysis sometimes can lead to inappropriate interpretation, it is a powerful tool for identifying related characteristics. This type of analysis is described in basic statistics textbooks.

Contingency Table Analysis. This approach to assessing the strength of relationships is more flexible than the correlation technique discussed above. Contingency tables can utilize variables with nonnumerical scales such as occupations or ethnic groups. This and the fact that such tables are easier to interpret, suggest that this technique is generally more appropriate than typical correlation analysis for studies of micro level characteristics. The strength of associations in contingency tables can be assessed quantitatively by computing a chi squared

value. Contingency tables, in their simplest form, compare two characteristics. For example, Table 4.1 suggests a relatively strong relationship between having little or no education and being a farmer. The data in the table might imply that individuals who acquire more than three years of education have a relatively good chance of not being a farmer. However, other factors also may be important. Suppose there were two ethnic groups (A and B) in the community. By separating people into these groups a different conclusion may be reached. Table 4.2, which was developed from the same data as Table 4.1, indicates that there is no relationship between education and occupation. No matter how much education they had acquired, twenty percent of the individuals in ethnic group A and eighty percent of those in group B were farmers. This hypothetical example demonstrates the ease with which misleading conclusions can be reached. Analysts using contingency tables, as well as any other technique, must be very careful when interpreting results. Contingency table analysis is described in basic survey research textbooks.

Impact Analysis¹⁵

Impact analysis focuses on the potential consequences of proposed development interventions. It can be used to assess the distribution of benefits and possible spread effects of proposed projects. Though impact analysis is relatively new, there is an expanding literature dedicated to this field.¹⁶ A variety of techniques come under this heading.

Comparative Case Studies. Impacts of the proposed project can be compared to those of similar development interventions in similar environments. Unfortunately, in most cases it is very difficult to find a comparative case. Though similar development interventions may have been attempted, it is unlikely that one has been attempted in a similar socioeconomic environment. However, some useful information can be obtained from what ever case studies or evaluations are available on similar interventions or on any projects undertaken in similar socioeconomic situations.

Checklists. Social impact analysis can be conducted using checklists or structured sets of questions which focus on potential impacts. Checklists usually include a comprehensive list of impact categories. Potential checklist items may include:

1. The typical, maximum, and minimum income and socioeconomic characteristics of individuals expected to participate in the proposed intervention.
2. The expected, maximum, and minimum direct benefits for each type of project participant.
3. The time and money input expected from each type of participant.

Table 4.1
SIMPLE RELATIONSHIP BETWEEN EDUCATION AND OCCUPATION

Occupation	Years of Education	
	Less Than 3 Years	More than 3 Years
Farmer	72.5 % (290)	35 % (70)
Non-Farmer	27.5 % (110)	65 % (130)
Total	100.0 % (400)	100 % (200)

Table 4.2
RELATIONSHIP BETWEEN EDUCATION AND OCCUPATION
FOR TWO DIFFERENT ETHNIC GROUPS

	Years of Education			
	Ethnic Group A		Ethnic Group B	
	Less Than 3 Years	More Than 3 Years	Less Than 3 Years	More Than 3 Years
Farmer	20 % (10)	20 % (30)	80 % (280)	80 % (40)
Non-Farmer	80 % (40)	80 % (120)	20 % (70)	20 % (10)
Total	100 % (50)	100 % (150)	100 % (350)	100 % (50)

4. The anticipated indirect costs and benefits for each type of participant.
5. Expected response of each relevant local organization.

For each item, the researcher comments upon impact size, importance, desirability, or distribution. These comments may be verbal or the analyst may assign numerical scores. The success of this approach depends primarily upon the experience, knowledge, and intuition of the investigators; the quality of the checklist is also a factor influencing success.

Scenarios. With this approach the analyst develops systems of logical events which could take place in the local community. One set of scenarios is created assuming that the proposed development intervention is not implemented. These then are compared to scenarios which include the intervention. A family of different scenarios can be developed by altering assumptions. For example, in one case, the scenario builder may assume complete local participation in the project and beneficial changes in the larger economic system. For the next case less optimistic assumptions might be made. Scenario writing has the added advantage of providing agency decision makers with understandable narrative statements about potential intervention outcomes. However, the technique is very dependent upon the knowledge and intuition of the analyst. Consequently, caution should be taken when interpreting scenarios.

Scenarios need not rely on the judgements and knowledge of a single individual. A number of analysts can write them and these can be compared and contrasted. The group then can meet and discuss differences and crucial issues identified in their separate analyses. These meetings may be either structured or unstructured; they may take the form of brain storming sessions. The group should attempt to arrive at a consensus concerning potential intervention outcomes. Though this approach may provide useful results, it can be expensive if several people are involved. Also personal dynamics may dominate the meetings and hinder the formation of a reasonable consensus.

Gaming. This impact analysis technique is related to the scenario approach. Individuals assume the roles and act out the reactions of important individuals or groups involved with the proposed project. Though gaming may provide useful results, it requires that the actors be very knowledgeable about the presumed behavior of community individuals and groups. The gaming approach may supply useful information on the whole development process. It usually leads to the conclusion that it is very difficult, if not impossible, to implement development interventions agreeable to all parties concerned.

Delphi.¹⁷ With this technique individuals submit completed checklists or scenarios to a central organizer who synthesizes and summarizes them. The summary is then sent to each participant

indicating areas of agreement and disagreement. Based on the summary, members rewrite the checklists or scenarios focusing on areas of disagreement. These then are synthesized and new summaries are sent back to the participants. The process continues until a measure of consensus is reached. The formal Delphi technique can provide useful information; however, it can be time consuming and expensive. Also the iterative nature of the approach and the drive to form a consensus may repress thoughtful minority points of view.

Though Delphi participants are usually development professionals, a variant of the technique can involve individuals from the local community.¹⁸ A group of knowledgeable locals are assembled and a gradually narrowing series of "What if?" questions are addressed. Disparate responses are clarified and refined into a more coherent and accurate scenario of the anticipated impacts of a proposed intervention. Although this approach requires considerable skill on the part of the investigator, it can be less expensive and reveal more information than the formal Delphi approach. An added advantage is that while the focus is on determining the impacts of a proposed intervention, the technique also can provide valuable information on the existing micro characteristics of the community.

Evaluation of Changes in Beneficiary Group Characteristics

Most development projects seek to stimulate positive change such as increased real income, reduced infant mortality, higher levels of literacy, or improved diet. Evaluation provides a method for determining if desired changes have occurred. It can be used to investigate the reasons for project success or factors responsible for failure.

The basic framework for an evaluation study is similar to a typical experimental research design. It involves a comparison between two groups: (1) the intended beneficiaries of the project; and (2) a similar (control) group which is not influenced by the project. Baseline data are collected on both groups before the project is initiated. After the project is implemented, data are again collected on the two groups. Three comparisons can be made:

1. Project target group characteristics before and after project implementation;
2. Postproject target group characteristics with postproject control group characteristics; and
3. Observed changes in project target group (during the course of project implementation) with the observed change in the control group.

These comparisons can reveal differences resulting from the intervention. The reasons for success or failure may be highlighted by careful analysis of the relationships between such

project elements as inputs, outputs, assumptions, purposes, and goals.

SOURCES OF FURTHER INFORMATION*

- * Chambers, Robert. "Rural Poverty Unperceived: Problems and Remedies." World Bank Staff Working Paper No. 400 (Washington: IBRD, 1980, 50 pp.). This excellent paper describes numerous problems and biases which arise when development agencies attempt to gather information on the characteristics of rural poverty. The author presents a number of remedial actions which can be used to ameliorate these problems and biases.
- * Connell, John and Michael Lipton. Assessing Village Labour Situations in Developing Countries (Delhi: Oxford University Press, 1977, 178 pp.). This book provides an indepth discussion of methods for collecting village level data. It focuses on sample survey techniques and their use in gathering data on labor utilization.
- * Foster, George M. Applied Anthropology (Boston: Little, Brown, and Co., 1969, 238 pp.). Numerous examples and anecdotes are provided of development projects which failed due to lack of appropriate micro analysis. Chapters focus on anthropological methodology, sociocultural characteristics of target groups and the nature of their interaction with development agencies.
- * Freedman, Deborah and Eva Mueller. A Multi-Purpose Household Questionnaire: Basic Economic and Demographic Modules, Prepared for World Bank and U.S. Agency for International Development (Washington, D. C.: IBRD, 1977, 100 pp.). This is a very useful tool for the design and implementation of household surveys. The report provides guidance on selection of respondents, interviewer training as well as adaptation of the questionnaire to particular localities and project information needs.
- * Freeman, Howard E., Peter H. Rossi, and Sonia R. Wright. Evaluating Social Projects in Developing Countries (Paris: Organization for Economic Co-operation and Development, 1979, 239 pp.). This excellent book discusses techniques for evaluating project implementation, impact, and efficiency as well as the role of evaluation in project planning and decision making.
- * Hageboeck, Moll). "Manager's Guide to Data Collection," Prepared for Office of Evaluation, U.S. Agency for International Development (Washington, D. C.: USAID, 1979, 91 pp.). Written for project managers, this very practical guide addresses: identification of the specific information

needed for decision making, management of data collection efforts, study design, and fieldwork techniques.

Kearl, Bryant, ed. Field Data Collection in Social Sciences: Experiences in Africa and the Middle East (New York: Agricultural Development Council, 1976, 200 pp.). A wealth of field experience is reflected in this report. Many data collection techniques are discussed and evaluated including single and multiple interview surveys, participant and nonparticipant observation, direct measurement (of field sizes, yields, etc.), and group interviews. Also provided are numerous tips and suggestions for improved data collection.

Ashe, Jeffrey. Assessing Rural Needs: A Manual for Practitioners (Cambridge, Mass.: ACCION/AITEC, 1979, 127 pp.). Presents methods for assessing community needs by conducting a single interview with a group of local people who are considered to "know the area".

Brown, James, et al, eds. Multi-Purpose Household Survey: in Developing Countries (Paris: Organization for Economic Co-operation and Development, 1978, 250 pp.). This report from a large study session discusses existing national survey efforts and the need to establish permanent national survey organizations.

Gutkind, P. C. W. Urban Anthropology: Perspectives on "Third World" Urbanization and Urbanism (Assen, Netherlands: Van Gorcum and Co., 1974, 262 pp.). Chapter Four of this book, which focuses almost exclusively on Africa, provides an in-depth discussion of methods used by anthropologists to investigate social groups in urban areas.

Herbert, John. Urban Action in the Third World: Guidelines for the Formulation of Projects (New York: Praeger, 1979). Several potential benefits and disbenefits are discussed for a variety of urban development projects including employment, water supply and sanitation, health services, education, housing, transportation, and urban management and finance.

Hirsch-Cesar, Gerald. Survey Research Methods in Developing Countries (New Delhi: Longman Orient, 1974). This book presents a good review of methodologies for design and implementation of surveys and analysis of survey data.

Knight, C. Gregory. Ecology and Changes: Rural Modernization in an African Community (New York: Academic Press, 1974). This is an excellent example of a micro analysis of development processes in a small rural region of Tanzania. Processes of change are viewed from cultural, ecological, economic, and spatial perspectives.

Laquian, Aprodico A. Slums Are For People (Honolulu, Hawaii: East-West Center Press, 1969). This book analyzes the social characteristics of a Manila slum and documents the Barrio Magsaysay urban community development project. A discussion is provided of the types of analysis used in assessing the target population and in developing the project.

Lloyd, Peter. Slums of Hope? Shanty Towns of the Third World (New York: St. Martins Press Inc., 1979, 246 pp.). Book describes living conditions, and the attitudes and perceptions of shanty town residents.

O. Barr, W. M., D. B. Spain and M. A. Tessler, eds. Survey Research in Africa: Its Applications and Limits (Evanston, Ill.: Northwestern University Press, 1973). This volume provides an excellent discussion of sampling, measurement, and survey administration in foreign cultures as well as addressing important ethical issues related to this research approach.

Pausewag, Siegfried. Methods and Concepts of Social Research in a Rural Developing Society (Munich: Weltforum Verlag, 1973, 214 pp.). Provides a detailed discussion and evaluation of the utilization of social survey methods in third world countries. Though the book focuses on experience in Ethiopia, it is relevant to micro analysis in all developing countries.

Perlman, Janice E. The Myth of Marginality: Urban Poverty and Politics in Rio de Janeiro (Berkeley, California: University of California Press, 1976, 285 pp.). This urban poverty analysis case study includes a detailed appendix of survey data collection methodology.

Pitt, David. The Social Dynamics of Development (Oxford, England: Pergamon Press, 1976, 162 pp.). Part Three, "Development from Below," discusses numerous aspects of development as viewed by the general populous in third world areas.

NOTES

1. George M. Foster, "Peasant Society and the Image of Limited Good," American Anthropologist, 67 (1965), pp. 293-315.
2. Oscar Lewis, "The Culture of Poverty," Scientific American, 215 (1966), pp. 19-25.

* Particularly useful sources of further information.

3. Everett Hagen, On the Theory of Social Change: How Economic Growth Begins (Homewood, Ill.: Dorsey Press, 1962). David C. McClelland, The Achieving Society (Princeton, N. J.: Van Nostrand, 1961).
4. Elliot Morss et al, Strategies for Small Farmer Development: an Empirical Study of Rural Development Projects, Prepared for U.S. Agency for International Development (Washington, D. C.: USAID, 1975). Norman T. Uphoff and Milton J. Esman, Local Organization for Rural Development: Analysis of Asian Experience (Ithaca, N.Y.: Cornell University Press, 1974). Uma Lele, The Design of Rural Development: Lessons from Africa (Baltimore: John Hopkins University Press, 1975).
5. Morss et al, (See note 4 above).
6. George M. Foster, Applied Anthropology (Boston: Little, Brown and Company, 1969), p. 87.
7. Ibid, pp. 3-4.
8. U.S. Agency for International Development, A.I.D. Handbook 3: Project Assistance (Washington, D.C.: U.S. Agency for International Development, 1976), p. 4A-1.
9. Robert Chambers, "Rural Poverty Unperceived: Problems and Remedies," World Bank Staff Working Paper No. 400 (Washington, D. C.: IBRD, 1980).
10. Much of the discussion in this section is drawn from Fred M. O'Regan et al, "Eliciting Local Needs in Planning for Urban Based Services for Rural Development," Prepared for Office of Urban Development, U.S. Agency for International Development by Development Group for Alternative Policies (Washington, D. C.: USAID, 1978).
11. Jeffrey Ashe, Assessing Rural Needs: A Manual for Practitioners (Cambridge, Mass.: ACCION/AITEC, 1979).
12. Much of the dicussion on the strengths and weaknesses of surveys is drawn from O'Regan et al (See note 10 above).
13. John K. Hatch, "The Corn Farmers of Motupe: A Study of Traditional Farming Practices in Northern Coastal Peru," Land Tenure Center Monograph No. 1 (Madison, Wisconsin: University of Wisconsin).
14. "Correlation" is a relatively general term, this segment of the text is limited to product-moment correlation.

15. Much of this section is drawn from: James C. Cramer, Thomas W. Dietz, and Robert A. Johnston, "Social Impact of SRAPC Regional Plans: A Review of Methods and a Recommended Process," (Davis, California: University of California, Kellogg-SRAPC Project, 1977, draft mimeo).
16. Duncan and Jones, Methodology and Guidelines for Assessing Social Impacts of Development (Berkeley, California: Duncan and Jones, Inc., 1976). Kurt Finsterbusch and C. P. Wolf, Methodology of Social Impact Assessment (Stroudsburg, Pennsylvania: Dowden Hutchinson and Ross, 1977). Stephen J. Fitzsimmons et al, Social Assessment Manual (Cambridge, Massachusetts: Abt Associates, Inc., 1975). Organization for Economic Cooperation and Development, Methodological Guidelines for Social Assessment of Technology (Paris: OECD, 1975). C. P. Wolf, ed., Social Impact Assessment (Paris: OECD, 1975). C. P. Wolf, ed., Social Impact Assessment (Milwaukee, Wisconsin: Environmental Planning Research Association, 1974).
17. H. Sackman, Delphi Critique (Lexington, Massachusetts: Lexington Books, 1974).
18. George Honadle, "Rapid Reconnaissance Approaches to Organizational Analysis for Development Administration," (Washington, D. C.: Development Alternatives Inc., 1979).

PREVIOUS PAGE

5

Migration and Urbanization

Increasing urbanization is one of the most pervasive processes in developing countries. Rural to urban migration continues even though urban unemployment and underemployment have reached very serious levels. Though natural increase is the primary cause of urban population growth, migration also makes a sizeable contribution. Much of the movement to the largest cities comes from smaller cities and market towns. These smaller centers are resupplied with people from rural areas. Rural to rural movements are also substantial, especially into new, unpopulated agricultural frontier areas. These spatial aspects of population dynamics have important implications for development interventions. Though interventions are incapable of stopping or reversing population movements in most cases, they may influence or redirect such movements. On the other hand, population movements can have significant influence on development activities; consequently, an understanding of these movements is needed for the proper design and implementation of interventions. The type of analysis described in this chapter can help provide this understanding.

Methods discussed here can be used to identify important differences between the demographic characteristics of urban and rural areas. In general, the former have fertility rates lower by fifteen percent to thirty-five percent and thus have a lower percentage of children. On the other hand, the proportion between ages fifteen and forty-five is higher in cities. In most developing areas, there are more males than females in urban areas; however, the situation is reversed in Latin America. Death rates are generally lower in cities and towns by roughly ten percent to twenty percent. A comparison of differences in birth and death rates reveals that natural increase is slightly lower in urban areas. In addition, there also are important differences with respect to household and family size, marriage and divorce patterns and rates, as well as ethnic and linguistic characteristics. Analysis of urban-rural demographic differences can provide useful information for many interventions such as those involved with estimates of labor supply, demand for schools, infrastructure and housing, and family planning .

Methods in this chapter can be used to make projections of future populations of individual regions, cities or areas within cities. Future urbanization and urban versus rural breakdowns can be investigated. Estimates can be made for subgroups of the population such as number of households, women, men, school age children, etc. There are a variety of different methods which can be utilized. The simplest, and usually most appropriate, methods are based on national population projections developed by national census or statistics offices or the demographic offices of international agencies. Estimating the future populations of individual regions and cities must take internal migration into consideration. This chapter presents several commonly used measures of migration and simple methods of estimating migration flows. Techniques are discussed for predicting future migration flows as well as assessing the migration impact of proposed development interventions.

RELEVANCE TO DEVELOPMENT INTERVENTIONS

Regional population shifts, urbanization, and migration are important factors in most development interventions. Regional development programs are designed to increase productivity, employment, and levels of living in specific areas. To design such programs properly, information is needed on the size and dynamics of the current labor force. A successful regional development program can promote in-migration; the impacts of these movements can be assessed before the program is undertaken.

Often rural development interventions partially are justified by their presumed negative influence on rural to urban migration. This may appear rational because migration normally is motivated by employment and economic concern. However, investigations and evaluations of numerous rural development projects in several developing countries reveal that such projects may not reduce rural to urban movements but actually stimulate them.¹ Capital intensive, "green revolution" projects may reduce the demand for agricultural labor, force small farmers to sell out, and thereby contribute to migration.

Even labor intensive, small farmer oriented interventions may stimulate rather than reduce migration. If these interventions are successful, they usually improve rural incomes which can provide the means necessary for movement to urban areas. Increased rural incomes may be invested in education for children. When these children finish school, they often move to urban areas in search of employment consistent with their skill level. In short, many rural development interventions contribute to out-migration. Unfortunately, this fact often is overlooked and too many rural projects are justified blindly for their supposed negative influence on migration. Proper analysis can provide information on the migration impact of proposed rural development interventions as well as improve their design and implementation.

Urban development projects normally are designed to increase employment or other quality of life indicators. Such activities

can stimulate migration and perhaps exacerbate urban problems. For example, urban employment generation programs may promote so much migration that urban unemployment levels actually increase. Analysis described in this chapter can be used to predict the migration impact of proposed urban development activities. These predictions can be utilized along with other information to assess the benefits and disbenefits of proposed projects.

In addition to contributing to better project impact assessments, types of analysis described here may provide background information for project identification and design. Estimates of future urban populations are needed to determine the demand for housing, public services, and urban infrastructure. For example, population projections can be used to estimate the number of low income families in future years who may be eligible for sites and services or other housing solutions. Estimates of the future number of school-aged children in each neighborhood can be used to program school expansion and construction activities. Analysts can disaggregate population estimates by sex, age, and education. Such information is useful for planning health delivery systems and employment generation activities. Relatively long range population projections can provide information needed for the design of urban water and sewerage projects. Furthermore, estimates of the distribution of population within urban areas are needed to design urban transportation projects.

TYPICAL QUESTIONS

- o What will the regional and urban-rural population distribution be in the year 2000? What are the estimated populations of each region and major city for the year 2000?
- o What are the birth, death and population growth rates of the country? Each region? Each major city? Market towns? Rural areas? What are recent changes and current trends with respect to these rates?
- o What are average household and family sizes in the capital city? Other major cities? Market towns? Rural areas? How have these changed in recent years? How are they expected to change in future years?
- o What are the population growth rates of neighborhoods within major cities? Which neighborhoods are expected to grow fastest in the next twenty years? Which have the highest population densities? Are these areas experiencing population growth or decline?
- o What are major migration flows? What are the primary areas of out-migration and in-migration? Is urban-to-urban or rural-to-urban migration dominant? What neighborhoods have the largest percentage of

migrants? What are the characteristics of migrants? Age? Sex? Level of education? Income? Occupation?

- o What are the key factors which influence migration flows? What effect on migration will result from the creation of 1,000 jobs in the capital city? In rural areas? What are the impacts of migration on migrants? On migration origins? On migration destinations?
- o What are past and present government policies with respect to fertility and migration behavior? What demographic data routinely are collected by government? What demographic analyses are conducted by government?

DATA SOURCES

Before primary data sources are identified and analyzed, existing studies should be scrutinized carefully. Often national census or statistics offices have developed population projections for individual regions, districts or urban areas. These can provide much of the background information needed for development interventions. Population projections also may be available from international agencies. The United Nations has made projections to the year 2000 for urban, rural, and big city (over 100,000) populations for all countries.² The Inter-American Development Bank has computed projections to the year 2000 for the individual departments, states, and cities (above 10,000-20,000) of numerous Latin American countries.³ Numerous agencies or individuals have surveyed and analyzed migration in developing countries. The results of these studies, which are referenced and reviewed in several publications,⁴ may provide useful information. Existing studies can supply background as well as act to clarify and focus key issues in need of further analysis.

There are three principle sources of primary data on urbanization and migration: censuses, surveys, and population registration systems. Censuses are conducted in most developing countries at roughly ten years intervals and involve a complete count or listing of inhabitants. Surveys collect information from only a subcomponent or sample of the total population. Population registration systems gather, on a continuing basis, certain types of vital statistics. Examples of such systems are official recordings of births, deaths, marriages, and divorces as well as social insurance and taxes.

Censuses

National censuses are the most readily available and often the best source of data. These normally are available at a high degree of detail. For each region or major city, data generally are published by age, sex, occupation, education level, family size, and migration status. In several countries this information is presented for small spatial units such as villages and

neighborhoods within cities. Where such is not the case, the data often can be obtained directly from census offices. Census data are not published for all population characteristics simultaneously, *i.e.*, on age, sex, occupation, education and migration in one master table. In other words, a census volume cannot indicate the number of women between twenty and twenty-five years old, employed as housewives, with two children, five years of education, born in region C, and resident in region A. A table containing such information could have 100 million cells and require 300,000 pages of print. This type of detailed census information can be obtained, however from census offices with appropriate computer software and facilities.⁵ Yet such a high degree of detail rarely is necessary. In most circumstances, data needed for the types of analyses discussed in this chapter are available in published census volumes.

Three different indicators of migration commonly are provided in censuses:⁶

Lifetime Migration. The most common census migration indicator shows the place of birth of individuals enumerated in each region, district, city, or other census geographical unit. This information can be used to separate the population into migrants (those enumerated in a different place than their place of birth) and nonmigrants. However, lifetime migration has a number of limitations. It provides no information on the timing of migration; it may have occurred last year or fifty years ago. It also suggests a single movement from place of birth to place of enumeration. Actually, migrants may have made numerous moves in between. In addition, lifetime migration data counts all persons enumerated in their birth places as nonmigrants. Some of these persons may have left and later returned. Despite these limitations, analysis of lifetime migration can provide useful information on long-term migration trends.

Place of Last Previous Residence. Census information on place of last previous residence overcome some of the weaknesses of lifetime migration data. The former focuses on direct migrations between places while the later overlooks intervening moves. Though last residence data account for return migration; they ignore the timing of migration.

Place of Last Residence at a Fixed Prior Date. One of the best single census indicators of migration is place of last residence at the fixed prior date, often five years before the census. This indicates both the time interval and spatial direction of migration. However, it tends to understate migration because return migration within the time interval is overlooked.

In summary, census data are readily available and often the most appropriate for analysis of migration and urbanization. The amount of spatial detail provided is particularly valuable for

investigating spatial dynamics of population change. The primary disadvantage of census data is their tardiness. They normally are collected at ten year intervals and it may take several years to compile and publish the data.

Surveys

Surveys can provide useful, up-to-date information on fertility levels, migration, and factors influencing these. While they are not as readily available or comprehensive as censuses, they may provide information which are not otherwise obtainable. Surveys are conducted by national statistics offices, by organizations, and by individual researchers. Survey analyses should be based, to the greatest extent possible, on existing surveys. New surveys should be proposed only when new survey data are absolutely necessary.

Surveys are an important source of information on migration. Though few contain enough data to identify all major migration flows, they can provide an excellent perspective on specific aspects. They may contain details on the characteristics of migrants coming from a specific village or going to a single urban neighborhood. Surveys can lead to important insights about migration processes. They can reveal the influence on migration of friends and relatives who have previously migrated, employment opportunities, and distance to and previous interaction with potential destinations. Though these factors are found to be important in most survey studies, others may be important in specific situations.

Registration Systems

Population registration systems in developing countries include the official registration of births, deaths, marriages, etc. Unfortunately, these data are not useful for analysis of migration and urbanization. Often vital events are not recorded because there is little incentive for most people to register these events. Also the data are often at dispersed locations and in a form not amenable to easy collection and analysis. For these reasons, use of registration system data usually is not recommended.

ANALYSIS OF DATA

There are two general purposes for analyzing migration and urbanization. The first is to make projections about future population distributions. The second purpose is to assess the impact of proposed interventions on population movements.

Urban-Rural Population Distribution⁷

The first important issue which must be faced is definitional; what definition of "urban" shall be used? There are

a bewildering variety of definitions and criteria used to distinguish urban places from rural areas. In many situations, the analyst uses the most convenient, sometimes arbitrary, definition which corresponds to available data.

A number of methods exist for estimating future urban and rural population distribution. Three general factors account for the changing pattern of urban-rural population distribution: (1) differences between urban and rural areas in the rate of natural increase, (2) migration, and (3) reclassification of rural areas on the urban fringe or individual settlements, for example "rural" villages being reclassified as "urban" towns. For analytical purposes these three factors are combined and attention is focused on net population growth in urban and rural areas.

Constant Growth Rate Method. With this simple approach, the past urban growth rate, based on previous censuses, is used to project urban population levels in future years. Future rural population levels are obtained by subtracting urban population from projected total population, which can be obtained from national or international demographic offices. The resulting rural growth rate can be checked to determine if it seems plausible; if it doesn't, ad hoc adjustments can be made. An alternative approach is to assume a constant rural growth rate and then obtain urban projections through subtraction. This strategy often is preferred because rural population growth is usually more stable than urban growth. Though the constant growth rate method is relatively crude, it can be used to obtain quick projections.

Ratio Method. This simple method assumes that the percentage urban grows at a constant rate. For example, if the percentage urban was fifteen percent in 1970 and twenty percent in 1980, the trend suggests an increase in percentage urban of five percent per decade. Consequently, the projected percentage urban in 1990 and 2000 would be twenty-five percent and thirty percent respectively. This simple method usually provides relatively good projections for countries with intermediate levels of urbanization (roughly twelve percent to sixty percent); however, it is unreliable for countries with very low or very high urbanization. It is often a good idea to compare constant growth rate and ratio methods and adjust the results accordingly.

United Nations Method. The United Nations uses a more complicated method based on the difference between urban and rural population growth and its logistic transformation. The approach is based on the empirical regularity that differences between urban and rural growth rates are relatively stable through time. The technique involves an iterative calculation and utilization of values from a logistic curve. Projections based on this rather complicated approach are generally superior to those of the simpler methods and should be utilized when they are available.

Projections for Individual Cities and Regions

In many cases, estimates are needed of a city's future population size and characteristics such as age and sex distribution, number of households, size of subgroups, or migration features. Simple methods for making these projections are similar to those for urban-rural projections. The constant growth rate and ratio method often are used to project populations of individual cities or other subnational geographical units. However, past growth rates for individual areas may be erratic. Some places may have grown very fast or declined between the last two censuses; such trends may not continue into the future. Modified methods have been developed to avoid some of the problems associated with the simple ratio method. The Inter-American Development Bank has utilized a technique based on the weighted trend of the latest three, four, or five censuses.⁸ More complicated techniques also can be used such as the United Nations method described above.

Age-Sex Projections. The future age-sex composition of a city has important implications for education, health care, and employment generation programs. The quickest and easiest method is to assume that the present pattern of age-sex composition will continue into the future. This usually provides fairly good projections because the age-sex pattern does not change very much from year to year.

The difference elimination method is more complicated.⁹ It is based on age-sex projections of the total country and individual population projections for each city or other spatial unit. These two projections are used in an iterative process which adjusts the age-sex percentages of each area until they are consistent with the age-sex projections of the total population.

The cohort survival method can be used to project directly populations within each age-sex category. However, the approach is very complicated and involves estimates of fertility, survival rates, and migration rates for each cohort. In general, this approach is not practical for projections of populations within each city or region.

Number of Households.¹⁰ For housing activities and other interventions, projections are needed on the number of households and/or number of families. There are a variety of definitions used for "household" and for "family;" the analyst must often use whatever definition is contained in available data sources. Projection methods for households and families are similar; for purposes of clarity and brevity, only households are discussed here.

The simplest approach of projecting households is the constant ratio method which assumes that the average number of persons per household remains constant through time. The approach is very simple but not very accurate. In general, average household size tends to decrease with time.

Better estimates of future number of households can be obtained using projections of adult population for each area.

Growth in the number of households is assumed equal to growth of adult population. This ratio then is used to estimate future number of households from projected adult population. Though this method is superior to the constant ratio approach, it may underestimate number of households because adults per household generally declines through time. To account for this trend, future adult to household ratios can be estimated and applied to projected adult populations.

More complicated methods exist; for example, life-table method, vital statistics method, and headship rate method. Such sophisticated methods, which are usually too time consuming for purposes of most urban and regional analyses, are described elsewhere.¹¹ However, if results based on these methods are available for areas of interest, they should be utilized.

Subpopulations. Projections also can be made for specific subpopulations such as ethnic, linguistic, poverty, or minority groups. The simplest approach is to assume that distribution among subgroups will remain constant through time. A better technique is to identify past trends in population composition and project these into the future. Techniques which can be used include constant growth rate method (for each relevant subpopulation) and ratio trend method.

Net Migration. Population levels from either censuses or projections can be used to estimate net migration into individual cities or other areas of interest. These estimates are based on the notion that net population growth is equal to natural increase plus net migration. In other words, net migration is equal to total population growth minus natural increase. Censuses and projections provide information on total population growth. A number of different methods can be used to evaluate natural increase.¹² First, natural increase in the area can be assumed to equal that of the total country. However, this tends to overstate natural increase in urban areas. Ad hoc adjustments can be made based on the knowledge that natural increase in cities is less than that of rural areas by about five percent in Africa and South Asia and by about twenty-five percent in Latin America. Second, natural increase can be estimated using the vital statistics method which develops separate estimates for number of births and deaths and combines these to get natural increase. Third, survival ratios for each cohort can be used.

Methods also have been developed for estimation of intercensal net migration. Net migration for an area at one census period is equal to: (total persons enumerated in the area but born elsewhere) minus (total persons born in the area but enumerated elsewhere). By calculating net migration for two census dates and subtracting, an estimate can be obtained of net migration during the intercensal period. While this simple method overlooks the births and deaths of migrants between the censuses, methods are available for estimation and inclusion of these births and deaths.

Projections for Areas Within Cities. The methods discussed above rarely are appropriate for projecting populations of areas within cities. Population growth at this scale is affected by density constraints, changing socioeconomic and demographic profiles, transportation networks, and the development of urban infrastructure. Generalities about population density patterns within cities provide useful insights. Usually, little population growth can occur in areas which are completely built. In the absence of demolition and new construction, these areas can absorb more population only by increasing the number of persons per housing unit. Areas with large tracts of vacant land may absorb relatively large increases in population. Urban population densities are highest in areas around the central business district and decrease with distance from the city center. Normally, as cities in developing areas grow, densities in all areas increase but densities farther from the city center increase at a faster rate. These generalities, knowledge about topography, transport systems, historical trends, and urban planning policy, as well as intuitive judgements can provide information on future intracity population growth patterns. Methods of estimating the spatial pattern of population growth within cities are discussed also in Chapter 10, Urban Land Use and Transportation.

Population Impacts of Proposed Interventions

Methods described in this section involve the development of models which can be used to assess the impacts of proposed interventions on the spatial distribution of population. Interventions tend to influence migration more than birth and death rates; therefore most models focus on migration.

Regression Models. Simple regression models can provide estimates of future net in-migration for each area. The models are based on the past relationships between net in-migration, the dependent variable, and pertinent independent variables such as employment levels, wage rates, unemployment statistics, or degree of urbanization. Once the models are specified, they can estimate future in-migration from data on future levels of the independent variables.

Other regression models focus on the flow of migrants among different areas within the country. Such models generally use similar independent variables and also include the distance between areas. Distance is an important factor; in general, the greater the distance between two areas, the fewer the number of migrants. Independent variables often include economic and other characteristics of both the migration origins and destinations. A simple example of this type of model is presented below:

$$M_{ij} = 6.3 - .01j_i + .02j_j - 0.16D_{ij}$$

where:

M_{ij} = Number of migrants moving from region i to region j.

J_i, J_j = Number of jobs in region i and region j, respectively, and

D_{ij} = Distance from region i to region j.

According to this simple model, if an intervention in region j increased the number of jobs (J_j) by 1,000, the resulting migration from region i to j is estimated to be 20 (i.e., $1,000 \times .02$). Most migration regression models are more complicated and include a greater number of variables.

Regression models have a number of advantages. They are relatively simple and can be formulated using readily available census data. The models can provide rational estimates of future migration streams. On the other hand, they have several disadvantages.¹⁵ The aggregated nature of the data may hide certain social aspects as well as mask migration characteristics of significant subgroups. The models overlook migrations within regions or areas. The use of place of birth migration data violates some of the assumptions of regression. For example, some movements, the so-called "dependent" variable, may have occurred ten to twenty years before the census and may have affected employment levels, a so-called "independent" variable. Despite these and other problems, this approach is often an appropriate means to assess the migration impact of proposed interventions.

SOURCES OF FURTHER INFORMATION*

- * Fox, Robert W. and Jerrold W. Huguot. Population and Urban Trends in Central American and Panama (Washington, D. C.: Inter-American Development Bank, 1977, 224 pp.). Detailed analyses and projections are provided for six countries. Population projections for the years 1980, 1990 and 2000 are provided for each department and urbanized area. Ratio trend methodology is used and explained.
- * Fox, Robert W. Urban Population Growth Trends in Latin America (Washington, D. C.: Inter-American Development Bank, 1975, 103 pp.). Population projections 1980, 1990 and 2000 are provided for each department (or state) and urbanized area of Argentina, Brazil, Chile, Mexico, Peru and Venezuela. Ratio trend methodology is used and explained.
- * Todaro, Michael P. Internal Migration in Developing Countries: A Review of Theory, Evidence, Methodology and Research Priorities (Geneva: International Labour Organization, 1976, 105 pp.). Book presents and discusses methods of economic analysis of migration.
- * United Nations. Manual on Methods of Estimating Population, Manual VI, Methods of Measuring Internal Migration,

Department of Social Affairs, Population Series No. 55, ST/SOA/Series A/47 (New York: U.N., 1970, 74 pp., Sales No.: E.70.XIII.3). This excellent report describes migration concepts and definitions and discusses census and survey data sources. Many direct and indirect methods of measuring or estimating internal migration are presented including: place of birth; previous residence; vital statistics method; survival ratio method; and migration rates, ratios, and other indices. Numerous examples are provided.

- * United Nations. Manuals on Methods of Estimating Population, Manual VII: Methods of Projecting Households and Families, Department of Economic and Social Affairs, Population Series No. 54, ST/SOA/SER. A/54 (New York: U.N., 1973, 100 pp., Sales No. E.73.XIII.2). Several methods are presented for using population data to estimate number of households and families. The methods include: simple ratios, life-table technique, and headship rate method. Examples are provided.
 - * United Nations. Manuals on Methods of Estimation Population, Manual VIII: Methods for Projections of Urban and Rural Populations, Department of Economic and Social Affairs, Population Series No. 55, ST/SOA/Series A/55 (New York: U.N., 1974, 120 pp. Sales No.: E.74.XIII.3). This excellent report discusses different "urban" definitions, components of urban and rural population change, and a variety of methods for projecting population and age-sex distributions of urban and rural areas and individual cities. Methods presented include: simple growth rate and ratio techniques, U.N. method of observed urban-rural growth differences, difference elimination, mixed projection methods, and cohort survival.
 - * Yap, Lorene Y. L. "Internal Migration in Less Developed Countries: A Survey of the Literature," World Bank Staff Working Paper No. 215 (Washington: IBRD, 1975, 47 pp.). Paper provides indepth review of econometric regression analysis of census data on migration. Four case studies are analyzed and elasticities are discussed. Weaknesses of the analyses are indicated. Key factors affecting migration are identified and policy conclusions are offered.
- Amin, Samir. Modern Migrations in Western Africa (London: Oxford University Press, 1974). The dependency paradigm is used to analyze migration processes in Western Africa.
- Arnold, Fred and Susan Cochrane. "Economic Motivation Versus City Lights: Testing Hypotheses About Inter-Changwat Migration in Thailand," World Bank Staff Working Paper No. 416 (Washington: IBRD, 1980, 41 pp.). Paper is a good example of regression analysis of migration.

Beier, George, et al. "The Task Ahead for the Cities of the Developing Countries," World Bank Staff Working Paper No. 209 (Washington: IBRD, 1975, 77 pp.). Report provides a good overview and typology of past, present, and expected future urbanization in third world countries.

Briggs, Pamela. "Some Economic Interpretations of Case Studies of Urban Migration in Developing Countries," World Bank Staff Working Paper No. 151 (Washington: IBRD, 1973, 55 pp.). After briefly reviewing migration theory and regression studies of migration, this paper provides a detailed review of 27 field surveys of migration in 17 different countries. Suggestions for improved methodologies are provided and migration policies are discussed.

Butterworth, Douglas and John K. Chance. Latin American Urbanization (Cambridge: Cambridge University Press, 1981, 143 pp.). This book focuses on migration and covers such topics as historical urban growth, motivation and migration decision making, characteristics of migrants, adaptation, urban class structure, political action by the urban poor, squatter settlements, and dependency theory.

Connell, John, et al. Migration from Rural Areas: The Evidence from Village Studies (Delhi: Oxford University Press, 1976). The book provides a very detailed review of theoretical and empirical migration studies.

Findley, Sally. Planning for Internal Migration: A Review of Issues and Policies in Developing Countries, Prepared for U.S. Bureau of the Census (Washington, D. C.: USGPO, 1977, 167 pp.). This indepth review discusses research on both the causes and consequences of migration. The policies discussed include rural development programs, rural land settlement and colonization schemes, and dispersed service center strategies. The report contains a very useful summary and conclusions chapter as well as very extension footnotes and bibliography.

Goldstein, Sidney and David Sly. Basic Data Needed for the Study of Urbanization (Liege, Belgium: International Union for the Scientific Study of Population, 1975, 100 pp.). Report focuses on improving censuses to facilitate research on urbanization.

Rhoda, Richard. "Development Activities and Rural-Urban Migration: Is It Possible to Keep Them Down on the Farm?," Prepared for Office of Urban Development, U.S. Agency for International Development. (Washington: USAID, 1979, 78 pp.). The paper develops a framework from the migration literature and uses it to investigate the migration implications of development interventions. It reveals that

many rural development activities may stimulate urban migration.

Sabot, R. H. ed. Migration and the Labor Market in Developing Countries (Boulder, Colo.: Westview Press, 1981, 344 pp.). This interesting set of papers addresses economic aspects of migration such as unemployment, income distribution, productivity, labor markets, and impacts on urban and rural economies.

Shaw, R. P. Migration Theory and Fact (Philadelphia: Regional Science Research Institute, 1976, 202 pp.). This theoretical review provides indepth discussion of several types of migration analyses including regression, cost-benefit models, factor allocation models, gravity probability schemes, and stochastic models. The book provides useful background for indepth analysis of migration.

Willis, Kenneth G. Problems in Migration Analysis (Lexington, Massachusetts: Heath, Lexington and Saxon House, 1974). An indepth review is presented of economic and regression analysis of internal migration.

Zachariah, K. C. and Julien Conde. Migration in West Africa: Demographic Aspects, Published for World Bank and OECD (New York: Oxford University Press, 1981, 166 pp.). Book reviews migration within and among nine West African countries. While causes and consequences of migration are not analyzed, the data presented provide a base for such analyses.

NOTES

1. Richard Rhoda, "Development Activities and Rural-Urban Migration: Is It Possible to Keep Them Down on the Farm?," Prepared for Office of Urban Development, U.S. Agency for International Development, Order No. AID/otr-147-79-25 (Washington, D.C.: USAID, 1979).
2. United Nations, "Trends and Prospects in the Population of Urban Agglomerations 1950-2000, As Assessed in 1973-1975," Department of Economic and Social Affairs, Population Division Working Paper No. 58 (New York: U.N., 1975). United Nations, Patterns of Urban and Rural Population Growth, Department of Economic and Social Affairs, Population Division (New York: U.N., 1979).
3. Robert W. Fox, Urban Population Growth Trends in Latin America (Washington, D. C.: Inter-American Development Bank,

* Particularly useful sources of further information.

- 1975). Robert W. Fox and Jerrold W. Huguet, Population and Urban Trends in Central American and Panama (Washington, D. C.: Inter-American Development Bank, 1977).
4. Pamela Briggs, "Some Economic Interpretations of Case Studies of Urban Migration in Developing Countries," World Bank Staff Working Paper No. 151 (Washington, D. C.: IBRD, 1973). Michael P. Todaro, Internal Migration in Developing Countries: A Review of Theory, Evidence, Methodology and Research Priorities (Geneva: International Labour Organization, 1976). Lorene Yap, "Internal Migration in Less Developed Countries: A Survey of the Literature," World Bank Staff Working Paper No. 215 (Washington, D.C.: IBRD, 1975).
 5. U.S. Bureau of the Census, CENTS-II: Census Tabulation System, Series ISPC4, No. 3 (Washington, D. C., 1975). U.S. Bureau of the Census, COCENTS: COBAL Census Tabulation System, Series ISPC 4, No. 2 (Washington, D.C., 1976).
 6. United Nations, Manuals on Methods of Estimating Population, Manual VI: Methods of Measuring Internal Migration, Department of Economic and Social Affairs, Population Studies, No. 47, ST/SOA/Series A/47 (New York: U.N., 1970, Sales No. E.70.XIII.3).
 7. Much of this section is drawn from United Nations, Manuals on Methods of Estimating Population, Manual VIII: Methods for Projections of Urban and Rural Populations. Department of Economic and Social Affairs, Population Studies, No. 55, ST/ESA/SER A/55 (New York: U.N., 1974, Sales No. E.74.XIII.3).
 8. Fox, Fox and Huguet (See note 3 above).
 9. U.N. (See note 7 above).
 10. United Nations, Manuals on Methods of Estimating Population, Manual VII: Methods of Projecting Households and Families. Department of Economic and Social Affairs, Population Studies, No. 54, ST/SOA/SER A/54 (New York: U.N., 1974, Sales No. E.74.XIII.2).
 11. U.N. (See note 7 above).
 12. Ibid.
 13. Yap (See note 4 above). Todaro (See note 4 above). R. Paul Shaw, Migration Theory and Fact (Philadelphia: Regional Science Research Institute, 1976). Kenneth G. Willis, Problems in Migration Analysis (Lexington, Massachusetts: Heath, Lexington and Saxon House, 1974).

Part 3

Regional Analysis

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6 Urban and Regional Functions and Interactions

A national economy can be viewed as a system of interacting regions. These may be of any size and character; some are predominantly rural while others are entirely urban. Regions tend to specialize in certain goods and services which are exported from the region. Rural regions export domestic food crops, minerals, or raw materials; urban areas export manufactured goods, semi-processed commodities, or a variety of services such as administration, transportation, wholesaling, banking etc. In addition, regions import goods and services which are not produced locally. The interaction implied by interregional trade is made possible by transportation and communication systems.

Regional exports, which often are referred to as the economic base, are an important determinant of the economic health of an area. For example, consider the region around Manaus, Brazil which specialized in rubber export during the early years of this century. Amazon rubber, the economic base, was demanded by the world market and the local rubber industry boomed. Through multiplier effects, prosperity in the rubber industry spread to such other economic activities as construction, retailing, transportation, entertainment, etc. These other functions, which were not exported, are known as nonbasic activities. When more efficient rubber producing areas in Asia were brought under cultivation, the demand for Brazilian rubber declined. As a result, the production of rubber, the economic base, declined bringing nonbasic activities down with it. This example demonstrates the importance of a region's economic base.

In this chapter, techniques and methods are presented for analyzing economic base and interregional interactions. Basic activities can be used to develop both classification schemes and multipliers for urban areas and regions. These are useful because they both enhance understanding and provide a framework for making decisions concerning development interventions.

RELEVANCE TO DEVELOPMENT INTERVENTIONS

Information on urban and regional systems can be an essential component of successful development intervention. Decisions must

be made concerning appropriate regions for specified projects and suitable projects for selected areas. These decisions should be based on an adequate understanding of the regional system and its functional elements, the cities and regions of which it is comprised. This chapter can contribute to this understanding. Analysis of regional functional specialization can identify the economic base of each city and region. Such information can be used to develop classification schemes which may prove useful in making decisions about development interventions. For example, small cities classified as "industrial" might be more appropriate for vocational training projects than small cities classified as "administrative centers." Regional multipliers can be estimated and used to assess the total (direct and indirect) economic impacts of proposed development interventions. Such macro economic impacts, along with information from micro socioeconomic impact studies (Chapter Four), can be used to evaluate proposed projects.

Analysis can provide information on the natural characteristics and development potential of regions. The potential for agricultural development is based on elements of the physical environment such as topography, soil quality, water availability, altitude, temperature, rainfall, etc. This information, market studies, and knowledge of current agricultural practices gained from micro analysis (Chapter Four) can be used to identify potential project opportunities.

Transportation networks are an important element in proposed development interventions. For example, existing transport capacities may be a crucial element in the design of an agricultural development project. Increased agricultural production will be wasted if it cannot be transported efficiently to markets. It may be necessary to upgrade existing interregional transportation before meaningful regional development can proceed.

TYPICAL QUESTIONS

- o What is the regional system within the country? Do economic regions coincide with administrative boundaries? Have economic regions been delineated by government?
- o What information is available on the regional system? Have regional profiles been developed? Have economic base studies been conducted? Are input-output tables available? Have regional interaction patterns been analyzed? Are resource inventories available? Is LANDSAT satellite imagery available?
- o What is the economic base of each region? Which regions, cities or towns specialize in key agricultural products? In textile industries? In agriprocessing activities? In heavy industry? In government services? In key food crops? In light industry? In private services? In wholesale activities? In extractive industries?

- o How are regions or major cities different or similar with respect to economic structure? Employment profile? Agricultural products and production? Natural resources? Development potential?
- o What urban centers are most suitable for new or expanded agriprocessing activities? Which cities are most suitable for industrial development? What direct and indirect economic impacts would result from the expansion of an old industry or establishment of a new industry?
- o What are the general physical characteristics of each region? What is the natural resource base? How effectively is it being utilized? Which regions have the greatest potential for agricultural development? For each agricultural area, what is the soil quality, topography, water availability, climatic environment, cropping pattern, intensity of land use, and current agricultural practice?
- o What are the important interregional flows of raw materials, semi-processed commodities and finished goods? How are these commodities moved from place to place? How efficient is the current commodity flow pattern?
- o What are the important characteristics of the interurban and interregional transportation system? What improvements have been made recently or are planned? Where are the major bottlenecks in the system? Is transportation an important constraint to development?

DATA SOURCES

Censuses and remote sensing are the two primary sources of basic data on existing and potential regional functions and interactions. Additional data may be obtained from previous studies, government reports, universities, and international development agencies.

Census Data

Detailed information for each urban area and region normally can be obtained from census data. Censuses usually are conducted about every ten years; consequently, the most recent census data may be outdated.

Population Census. Data from this source on the occupations and industries of all employed persons reveal the functional specialization of each city and region. For example, a relatively large percentage employed in mining is indicative of a region specializing in mineral exports.

Census of Businesses. These data may indicate wage rates, firm sizes, and detailed industrial and enterprise classifications. They also may supply information on other aspects of the regional economy such as capital-labor ratios, production levels, productivity, and commodity transfers between firms. Data from business censuses can be updated with information from annual business surveys. Useful data may be available also from central statistics offices or ministries of commerce, industry, or economics.

Agricultural Census. This source may indicate farm sizes, cropping patterns, yields, total crop and livestock production, markets, farming practices, and land tenure. Sometimes census data can be updated using annual government surveys of agriculture. Departments and ministries of agriculture may have additional information. For example, agricultural agencies may have data on physical characteristics such as soil type and quality, slope and drainage, water availability, pests, insects, crop and animal diseases, climatic characteristics, elevation, and other environmental factors. This type of information is useful in making assessments of the agricultural potential of regions.

Remote Sensing

Remote sensing involves the collection of data from airplanes and earth satellites. This relatively low cost approach is recommended highly for obtaining basic data on the physical characteristics and resource potentials of third world areas. Most countries already are using some forms of remote sensing data.

Aerial Sensing. Airplanes can be used to collect regional data quickly and efficiently. Traditional aerial photographs and relatively simple photo interpretation techniques can yield considerable information. A variety of data can be collected using color and color infrared film and a variety of filters. More detailed information can be obtained using a scanning system which sweeps rapidly over an area collecting minute impulses from earth and converting them into electronic signals. Such signals are amenable to computer analysis and storage; they can be used also to produce a variety of photographic images. Radar aerial sensing techniques can be used in overcast weather or even at night. Considerable data on the Amazon Basin has been collected using radar in combination with other remote sensing techniques.

Aerial sensing can provide a wide variety of information on regional characteristics:¹

Agriculture: crop inventories, yield estimates, crop vigor, insect and disease detection, livestock inventories, and fertilizer impact.

Land: land use inventories, soil surveys, mineral deficiency, topography, geological mapping,

detection of geothermal activity, petroleum, and metallic mineral deposits.

Water: water body monitoring, drainage pattern, soil moisture, estimation of salinity, erosion, drought monitoring, and fish surveys.

Forestry: forest resources inventories, detection of tree diseases, tree growth rates, and identification of vegetation types.

Though aerial sensing is relatively inexpensive, new sensing activities should not be undertaken until existing data sources are investigated. One of the most readily available sources of existing data is satellite imagery.

Satellite Imagery. Considerable information on regional features is currently available at very low cost from LANDSAT satellite imagery. Data are available on over eighty percent of the earth's surface. LANDSAT uses a scanning system which can provide information on:

crop patterns	water bodies
foilage	drainage
plant diseases	geological structure
insect infestation	roads
timber reserves	village locations
land use	

At nominal cost, LANDSAT satellite imagery in the form of transparencies, prints, and color composites are available from the EROS Data Center.²

ANALYSIS OF DATA

There are three general types of regions: homogeneous, nodal, and programming. Homogeneous regions are contiguous areas with similar characteristics. For example, an area of similar natural environment and agricultural practice is a homogeneous region. Nodal regions are contiguous, heterogeneous areas which are interrelated functionally. A city with its surrounding hinterland is an example of a nodal region. The urban and rural portions of the region are different but interconnected. Programming or planning regions are established by governmental agencies in order to implement and administer regional programs. Often the boundaries of programming regions coincide with the boundaries of political jurisdictions. Programming regions, which also may be homogeneous or nodal regions, are of primary interest to development agencies.

The core-periphery concept is used often to describe regions in third world countries. Core regions are composed of major cities which have experienced economic growth. Periphery regions

are the remaining undeveloped areas of the countries. According to this concept, periphery regions are drained by the core of their human, economic, and other resources.

Regional Profiles

One of the first steps in analysis of urban and regional functions is development of profiles or regional statistical compendiums.³ Profiles provide a concise description of regions' characteristics; they include quantitative and qualitative data as well as maps and other visual information. The data should be organized in such a way as to communicate effectively the essential characteristics of the region and to facilitate comparisons. Profiles include basic information on regional population and geographic size, major centers, physical characteristics, primary economic activities, linkages, development activities, and trends and recent changes. Some of the types of information which can be included are presented in Table 6.1. The table is only suggestive; in many cases appropriate information on all items listed will not be available. In other cases, additional information should be added. For example, more detailed information of natural characteristics would be provided if agricultural or natural resource development activities were proposed. Such information might include: soil types, quality, and distribution; seasonal temperature and rainfall patterns; slope; drainage; land use; and hydrology.

Basic profile information can be used to compare and contrast regions. Generalizations can be identified and used to uncover regions with characteristics which do not fit the normal pattern. Comparison also can provide basic information for development of regional typologies or classification schemes.

Regional Specialization by Economic Function

Classification. A number of qualitative and quantitative methods of urban functional analysis and classification have been developed. Though these primarily have been used to analyze and classify urban centers, they are equally applicable to regions. While classification for its own sake is rather useless, it can be useful to help analysts identify and describe the distinctive functions of various cities and regions.

Most classification methods are related to the concept of economic base. For example, cities which export manufactured goods, and thus have a manufacturing economic base, are classified as "manufacturing" centers. Generally economic base is identified by employment data. For instance, cities with a higher than average percentage of employees in transportation industries are assumed to provide transportation services to other regions. Therefore, transportation is assumed to be an element of the economic base. Areas with several functional specializations can be classified in several categories. For example, a city could be classified as a "mining, manufacturing, and transportation" city.

Table 6.1

TYPES OF INFORMATION FOR INCLUSION IN REGIONAL PROFILES

GENERAL CHARACTERISTICS

Population size, age-size distribution, growth rates,
 migration
 Areal size, population density
 Major cities and market towns and their population
 Distribution of income, expenditure patterns
 Education, health, housing, living conditions, etc.
 Governmental structure and characteristics
 Key subgroups: farmers, ethnic minorities, poverty groups

PHYSICAL CHARACTERISTICS

Topography and geographic features
 Mineral resources and geological structure
 Climate and water resources
 Soil types and natural vegetation
 Natural resources

ECONOMIC CHARACTERISTICS

Employment, unemployment, underemployment, labor force
 participation rates
 Income and wages by industry
 Labor productivity, labor/capital and capital/output ratios
 by industry
 Gross and per capita regional product and value added
 Economic base of region and each major urban area
 Location quotients and coefficients of specialization
 Capital investment and accumulation
 Firm size distribution and location of major firms

TRANSPORTATION AND INTERACTION CHARACTERISTICS

Major land, water and air transportation arteries and flows
 Volume of commodity flows to other regions (exports)
 Major markets for exports
 Quantity and origin of goods and commodities imported to
 region
 Communication networks, flows, capacities, costs

SPECIFIC CHARACTERISTICS

Ongoing and planned development activities
 Development constraints or key problems and crucial issues

Location Quotient. This is a simple and useful approach for analyzing functional specialization. A location quotient is the percentage of city (or region) employment in a specific industry divided by the percentage employment in that industry in all cities (or regions) in the country. For example, if twenty-five percent of the employment in Rabat were in public administration and ten percent of the employment in all Moroccan cities were in public administration, the location quotient for public administration in Rabat would be 2.5. Location quotients substantially greater than 1.0 indicate functional specialization. Quotients substantially less than 1.0 suggest the city or region must import goods or services produced by the industry. Local service industries generally have location quotients near 1.0 because local services normally are not exportable. The range of location quotients is related to industry type and regional size. For industries which normally are limited to specific areas, such as mining, location quotients may range from 0 to 20. On the other hand, location quotients for relatively ubiquitous activities, like agriculture, may only range from 0.7 to 1.5. If data permit, it is useful to subdivide agriculture into specific subcomponents or crops. Location quotients above some specified level can be used to classify cities or regions. For example, cities with location quotients in manufacturing of above, say 2.0 or 2.5, could be classified as "manufacturing." Alternatively, those with location quotients over 3.0 could be specified as "dominately manufacturing," while those with quotients between 2.0 and 3.0 could be classified as simply "manufacturing."

Location quotients change with time. These changes indicate temporal trends and spatial shifts in urban and regional functions. To investigate these changes, analysts can calculate quotients at different points in time. Location quotients for the last two or three censuses can reveal relatively long range shifts. Short term trends can be identified if more recent time series data are available.

An approach similar to location quotients was used by Nelson to develop a statistical classification scheme.⁴ He classified cities by comparing their percentage employment in selected industries with the statistical distribution of comparable employment percentage of all cities. For example, he would classify a city as "manufacturing," if its percentage employment in manufacturing was greater than one standard deviation³ above the average. Two standard deviations above the average would result in a classification of "dominant manufacturing." In classifying cities, Nelson used ten basic categories: mining, manufacturing, transportation and communication, wholesale trade, retail trade, financial insurance and real estate, personal services, professional services, public administration, and diversified (a catchall class for cities not falling into any other category). These ten classes are offered only as an example; other categories may be more appropriate in other countries or for classifying regions.

Economic Base. The economic base concept assumes that the existence and growth of a city or region depends on the goods and services it produces locally and sells beyond its borders. Sales of these basic goods and services bring in outside money which can be used to import needed goods and services not produced locally. Goods and services produced and consumed within the region are classified as nonbasic activities.

According to economic base theory, the level of basic activity is dependent upon exogenous demand. The level of nonbasic activity is determined by the size of the basic sector. Therefore, the level of total economic activity (basic plus nonbasic) is linked to exogenous demand. If exogenous demand increases, employment in basic activities increases thus stimulating additional demand for nonbasic goods and services. This multiplier effect is a key concept of economic base theory. The base multiplier is defined as total economic activity divided by basic economic activity.⁶ In general, level of economic activity is measured by the number of employees. The base multiplier indicates the impact on total employment of changes in basic employment. For example, suppose region A had 30,000 total employees with 10,000 basic and 20,000 nonbasic workers. Also suppose that timber production was the economic base. If the demand for timber increased, an additional 100 timber workers could be hired. Because the ratio of nonbasic to basic employment is two to one, this would result in an additional 200 jobs in the nonbasic sector. The total multiplier in this case is three and 300 total new jobs would result.

The economic base approach is useful because it indicates both functional specialization and the impacts of development interventions which change basic sector employment. The most serious problem with the approach is distinguishing basic from nonbasic employment. Another problem is related to the time lag between increase in basic activity and resulting increase in nonbasic activity.

A number of methods are suggested for separating basic from nonbasic employment.⁷ The simplest approach is to assume that certain industries are entirely basic and others are entirely nonbasic. For example, the analyst might assume that all employees in manufacturing are basic while all those in service industries are nonbasic. Though this approach can provide quick estimates of base multipliers, it is relatively crude even when practiced by experts. In most cases, each industry includes both basic and nonbasic activities. Alternative methods have been developed to separate basic and nonbasic employment. These include the location quotient technique and the minimum requirements approach.⁸

The economic base approach is very simple compared to regional input-output analysis. In the former, economic base is divided into two sectors (basic and nonbasic) and two spatial areas (the region of interest and all other regions). In contrast regional input-output involves a variety of sectors (agriculture, industry, transportation, etc.) and all regions in the national economy. The approach is based on the idea that each sector in

each region potentially is linked to every other sector in every other region. Regional input-output analysis can be useful in assessing the impacts of proposed development interventions. For example, it can indicate the total economic impact in each sector of each region of a development investment in one sector of one region. Unfortunately, the data needed to construct an accurate regional input-output table are extremely difficult to collect. If tables have been developed previously, they may be utilized. If not, regional input-output analysis usually is not practical for analysts working on specific development projects.

Interregional Flows and Transportation

Transportation is a key factor in the functional specialization of cities and regions. Without transportation, there could be no specialization; every area would have to be self-sufficient. Information on transportation systems and interregional flows of people and goods and services is essential to adequate understanding of urban and regional systems.

Interregional Commodity Flows. Flows of commodities between regions can be investigated by constructing a commodity flow matrix.⁹ The matrix indicates, for each major commodity, annual tonnage and/or monetary value of flows from each region to each other region. Commodity flow matrices may be available from transportation ministries or other government agencies. If appropriate data are not available, efforts can be made to construct the matrix using estimates or expert judgements. Sometimes it is useful to disaggregate interregional flows by transportation mode.

Interregional commodity flow matrices can reveal inefficient flow patterns or needed improvements in the transportation system. This investigation can rely on five basic transportation principles.

1. The cost of overcoming distance implies that short moves are more common than long ones.
2. Low-cost bulky items, such as sand or gravel, can be economically transported only short distances while more expensive commodities, such as watches or cameras, are moved long distances efficiently.
3. Commodity flows do not occur unless there is ample supply of the commodity in one region and sufficient demand in another region.
4. The cost of a commodity at its final destination reflects the cost at its origin plus the cost of transport.
5. All else being equal, industries tend to locate in areas where the combined costs of moving raw materials to the factory and finished goods to markets are minimized.

Flow allocation models have been developed which determine the most efficient pattern of commodity flows.¹⁰ These models utilize data on the demand and surplus supply at each location and the cost of transport between each pair of locations. Though computers normally are used, manual allocation methods have been developed. Allocation models can be used to assess the efficiency of existing flows as well as to design future, more efficient, flow patterns.

Gravity Model

Gravity models can be used to analyze and estimate flows of commodities, information, and people. The simple gravity model is based on the hypothesis that the quantity of flow between two points is: (1) directly related to the supply at the origin and demand at the destination and (2) inversely related to the distance between the origin and destination. For example, the flow of rice from a producing region to a consuming area could be represented as:

$$F_{xy} = .08 \frac{S_x P_y}{D_{xy}}$$

Where:

- F_{xy} = Flow or quantity of rice shipped from region X to area Y
- S_x = Surplus rice produced in region X
- P_y = Population of area Y; and
- D_{xy} = Distance between X and Y.

Gravity models are developed using data on past flows. Once developed, they can be used to estimate current or future flows.

SOURCES OF FURTHER INFORMATION

- * American Society of Photogrammetry. Manual of Remote Sensing (Falls Church, Virginia, 1974, 2 volumes, 2144 pp.). Though somewhat dated, this manual presents in a very comprehensive collection of remote sensing techniques and applications.
- * Bendavid, Avron. Regional Economic Analysis for Practitioners: An Introduction to Common Descriptive Methods, Revised edition (New York: Praeger, 1974, 195 pp.). This excellent book presents basic descriptive methods of regional economic analysis including: regional profiles, data needs, social accounting, linkages and flows, industrial composition analysis, economic base, and input-output analysis. The volume is an important reference tool for regional analysts.

- * Herfindahl, Orris C. Natural Resource Information for Economic Development (Baltimore: The Johns Hopkins Press for Resources for the Future, Inc., 1969, 212 pp.). Types of natural resources data and their sources are presented. Included are aerial photographs, topographic and soil maps, geological and climatological surveys as well as land use inventories. Guidelines are provided for programming, scheduling and funding information collection activities.
- * Sabins, Floyd F., Jr. Remote Sensing, Principles and Interpretation (San Francisco: W. H. Freeman, 1978, 426 pp.). Presented are a wide variety of remote sensing methods.
- Bendavid-Val, Avron and Peter O. Waller. Action-Oriented Approaches to Regional Development Planning (New York: Praeger, 1975, 132 pp.). This book, which is designed for regional planners in developing areas, presents a very pragmatic approach to regional planning. The five case studies are good examples of practical regional analyses.
- Ganguly, D. S. Regional Economy of West Bengal: A Study of Urbanization Growth Potential and Optimization of Industrial Location (New Delhi: Orient Longman Ltd. 1979, 306 pp.). Book presents a comprehensive case study of regional functional analysis.
- Gutierrez, Alfredo, et al. "Paraguay: Regional Development Eastern Paraguay," (Washington: World Bank, 1978, 50 pp.). This is a good example of regional development analysis based on natural resource base.
- Hewings, Geoffrey, J. D. Regional Industrial Analysis and Development (London: Methuen, 1977, 180 pp.). A good review of regional quantitative analysis is presented including regional development theory, economic base, trade flows, input-output analysis and policy issues.
- Hoover, Edgar M. An Introduction to Regional Economics, 2nd edition (New York: Alfred A. Knopf, 1975). This basic textbook covers transportation and interaction, location theory, urban systems, regional economic structure as well as other elements of urban and regional economics. Numerous American examples are presented.
- Isard, Walter. Methods of Regional Analysis: An Introduction to Regional Science (New York: Wiley, 1960). Though dated, this book provides an excellent discussion of methods of analyzing urban and regional functions and interactions. Included are interregional flow, economic base, multiplier, and input-output analyses.

Isard, Walter and John H. Cumberland. Regional Economic Planning: Technique of Analysis for Less Developed Areas (Paris: Organization for European Economic Co-operation, 1961, 450 pp.). Though somewhat dated, this volume includes relevant papers on analysis of regional agricultural structures, regional social accounts, input-output, regional survey techniques, and regional cost-benefit analyses. Case studies are presented.

Mahar, Dennis J., et al. "Brazil: Integrated Development of the Northwest Frontier" (Washington: World Bank, 1981, 101 pp.). Paper provides a good example of regional analysis; includes economic development potential, prospects for population growth, development plans for the region, and environmental concerns.

Oppenheim, Norbert. Applied Models in Urban and Regional Analysis (Englewood Cliffs, N.J.: Prentice-Hall, 1980, 351 pp.). This comprehensive text provides theoretical and practice discussions and examples of economic base and input/output models, transportation analysis, demographic techniques, and regression modeling.

Scott, Ian. Urban and Spatial Development in Mexico (Published for World Bank (New York: Oxford University Press, 1982, 320 pp.). Book examines patterns of interregional development, urbanization, rural-urban integration, and centralization.

Taaffe, Edward J. and Howard L. Gauthier, Jr. Geography of Transportation (Englewood Cliffs, New Jersey: Prentice Hall, Inc., 1973, 256 pp.). This is a good state-of-the-art document on analysis of interregional transportation.

UNESCO. Aerial Surveys and Integrated Studies (Paris: UNESCO, 1968). Presented are over fifty papers on the utilization of aerial photography in regional resource inventories and other development related projects.

Wilson, A. G. Urban and Regional Models in Geography and Planning (London: John Wiley and Sons, 1974, 418 pp.). Presented are a variety of sophisticated analytical models of urban and regional functions and interaction.

NOTES

1. Vikram Sarabhai, et al, "The Uses of Remote Sensing," Development Digest 15 (1977), pp. 17-25.

* Particularly useful sources of further information.

2. EROS Data Center, United States Geological Survey, Sioux Falls, South Dakota, U.S.A.
3. Avrom Bendavid-Val, Regional Economic Analysis for Practitioners: An Introduction to Common Descriptive Methods, Revised ed. (New York: Praeger, 1974), pp. 20-21.
4. H. J. Nelson, "A Service Classification of American Cities," Economic Geography 31 (3) (1955), pp. 189-210.
5. "Standard deviation" is a commonly used statistical measure of the variation of a set of numbers from their mean.
6. An alternative definition of base multiplier is change in total economic activity divided by change in basic activity.
7. Bendavid-Val (See note 3 above).
8. Ibid. Maurice H. Yeaters and Barry H. Garner, The North American City (New York: Harper and Row, 1971).
9. Bendavid-Val (See note 3 above).
10. Edward J. Laaffe and Howard I. Gauthier, Jr., Geography of Transportation (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1973).

7

Central Place Service Centers

While the previous chapter was directed at the economic export base of regions, the present chapter focuses on nonbasic economic activities. Such activities produce goods and services which are consumed within the region; for example, public services retail trade, construction, or personal services. These activities generally are supplied by cities, market towns, villages and other urban centers. Such centers are called central places because they provide goods and services for the surrounding rural areas. In this chapter, a number of methods are presented for identifying and analyzing central places and their linkages with rural service areas.

Three basic concepts are important to understanding central place systems. The first is the threshold concept. Threshold is the minimum level of demand that an activity needs to survive. For commercial establishments, this level is the amount of sales needed to stay in business. For public services, threshold is the minimum number of users needed to make the activity viable. In practice, thresholds normally are measured as the minimum population required to support a particular activity. For example, a population of 500 might be needed to support low order functions such as a primary school or food shop. Middle order functions such as secondary schools or daily public markets may require a population of 5,000. High order functions such as colleges, hospitals, appliance stores, or cinemas may need 50,000 people. While low order functions are supplied by virtually all central places, higher order functions can be provided only in larger places which are fewer in number.

The second basic concept, range, is the distance people travel to obtain certain functions. While short trips of only two or three kilometers might be necessary for lower order goods, travel of one hundred kilometers or more may be required for higher order goods. In a sense, range determines the extent of the service area of each type of function. For instance, the service area of a primary school may extend for only a couple of kilometers around the school while the hinterland of a regional hospital may extend for hundreds of kilometers.

The third basic concept is hierarchy. The concepts of threshold and range imply the existence of hierarchies of central places and the functions they provide. For example, a region may have one regional city supplying high order functions to a population of 200,000; four secondary cities each serving from 20,000 to 60,000 people; thirty market towns each providing functions for 5,000 to 15,000; and at the bottom of the hierarchy, one hundred villages each supplying low order functions for 500 to 2,000 people. Taken together these villages, market towns, secondary cities and regional centers comprises a central place hierarchy.

Thresholds, ranges and the structure of central place hierarchies vary considerably from region to region and country to country. Such variations depend upon a number of factors such as level of development, agricultural system, local tastes and preferences, climatic and physical characteristics, etc. In areas where threshold is insufficient to support a central place function on a daily basis, the function may be provided one or two days a week. Such periodic markets are very common in small central places of developing areas.

The concepts of threshold, range and hierarchy are basic components of central place theory. The theory, which is based on a number of relatively stringent assumptions, explains the structure of central place hierarchies and provides a conceptual framework for understanding central place systems. Analytical methods are available for identifying central place hierarchies, estimating service areas and thresholds, and investigating linkages between centers and their hinterlands. Techniques can be used also to determine what new central place functions are needed and their most appropriate locations. Such techniques are directly relevant to proposed development interventions which focus on the provision of basic services to rural areas.

RELEVANCE TO DEVELOPMENT INTERVENTIONS

An increasing number of development interventions are designed to increase agricultural production and improve the provision of basic services in rural areas. Such interventions, which are motivated by both growth and equity considerations, often aim to improve the provision of central place functions. These functions provide farmers with needed inputs such as fertilizer, seed, pesticides, tools and implements, transportation, storage, credit, and information concerning improved agricultural practices and market conditions. In addition, central place services can increase the well-being of rural populations by supplying public services such as education, health care, utilities, credit, communication, and administration. Private services which contribute to rural well-being include a wide variety of retail outlets, food shops, entertainment, off-farm employment, and transportation. Rural areas without easy access to such services cannot fulfill their development potential. Appropriate

development interventions can improve the provision of central place services and therefore enhance rural development.

Analyses described in this chapter are designed to enhance understanding of central place systems and contribute to the identification of appropriate interventions. Techniques enable analysts to recognize the structure of existing systems and uncover specific areas in need of additional or improved services. Investigations may reveal that the lack of certain central place functions is an important constraint to local development. If areas are in need of key functions and analysis indicates that they can support them, then interventions can be proposed which provide or induce the provision of these functions.

The efficiency of existing central place systems can be assessed and new spatially efficient systems designed. New systems can be tailored to meet certain objectives using location allocation methods. Possible objectives include minimizing the average distance farmers must travel to obtain a given service or ensuring that all farmers are within a specified distance, say forty kilometers, of a selected service.

TYPICAL QUESTIONS

- o What are the general characteristics of the existing central place hierarchy? How many centers are there at each level of the hierarchy? Which centers at which levels are growing most rapidly?
- o What functions currently are provided by existing central places at each level? What essential functions are not provided effectively? How can the system be changed to overcome the deficiency?
- o What central place services or functions are provided by the national government? Regional government? Provincial government? District government? Municipal government? Cooperative societies? Private entrepreneurs?
- o What are the service areas boundaries of each central place? About how many people are served by each place? What is the maximum and average distance rural people travel to obtain each type of service? What is the average and minimum threshold population needed to support each function? Which areas have sufficient population to support additional functions? Why are these functions not provided? What has to be done to induce the provision of these services?
- o What are the service center utilization patterns of rural residents? To which centers do farmers go to obtain needed agricultural inputs such as fertilizer,

farm implements, improved seed and credit? What changes can be made in the road network to improve rural access to central place services?

DATA SOURCES

Data are needed on two general aspects at central place functions: (1) The supply of functions at each center, and (2) the demand for functions in each area. Supply data, which usually are easier to obtain, relate both to the services located in centers and the urban-rural linkages which enable rural populations to obtain such services. Demand data indicate the ability and desire of urban and rural populations to utilize existing and proposed services.

Data on Supply of Central Place Functions

Information on the supply of functions can be obtained from censuses, government and business agencies, or surveys.

Censuses. Business censuses often indicate the locations and sizes of a variety of enterprises. However, the information may exclude informal sector activities. If business censuses are not available, information can be obtained from population censuses which usually indicate the number of employees in each area by industrial classification. Often the data are coded according to the Uniform National Industrial Classification System which is recommended by the United Nations. This coding system distinguishes types of industry, (i.e., service, retail, or manufacturing) and types of specific functions (for example, within the retail group, food stores, clothing stores, etc.). If a place has employment or a business establishment in one of these specific functional categories then it is assumed that the place provides that function. Employment data from censuses are particularly good because they cover formal and informal sectors. An example of central place analysis using census employment data is provided in Chapter Twelve, Panama Case Study.

Government and Business Agencies. Information on the supply of central place functions may be obtained from business directories and licensing agencies. However, these sources often are limited to formal sector activities. Government agencies are a good source of data on public services. Ministries of education can supply information on the locations and capacities of schools. Health ministries or departments usually have data on the locations and characteristics of hospitals, clinics, health posts, and family planning centers. Information on the supply of agricultural inputs, extension, and markets often are available from agricultural ministries. Public works agencies have information on electricity, water systems, sewerage, and road networks. Banks and other financial organizations may supply data on the locations of

credit and banking services. Information is available on the spatial distribution of post offices and telegraph and telephone services. In summary, a wealth of data on the supply of public services can be obtained from government and business agencies; however, collecting bits of data from numerous agencies can be time consuming.

Surveys. Central place surveys often are used and can be relatively easy to conduct. Questionnaires which list all potential services can be mailed to responsible individuals in each center such as local administrative leaders, district development officers, extension workers, or school administrators. To complete the questionnaire, individuals simply mark those functions on the list which are provided in the center of interest. Students or other paraprofessionals may travel to centers and conduct the survey. Alternatively, analysts and planners may complete the survey in conjunction with other field work activities. Spot surveys may be undertaken to verify data obtained from other sources. Survey approaches are discussed in greater detail in Chapter Four, Micro Analysis of Beneficiary Groups.

Data on Demand for Central Place Functions

Accurate data on the demand for central place functions are more difficult to obtain than supply data. The latter primarily are concerned with a simple dichotomy, the presence or absence of specific functions at discrete locations. In contrast, demand data are concerned with the continuous scale of the ability and desire of people to utilize each function at each location. It is very difficult to collect information on this scale which is dependent upon several factors such as the perceived need for the function, the income of the population, and their willingness to travel to the central place. Since these factors usually are hard to measure, population often is used as a surrogate measure of potential demand for central place functions. Though some analysts use the population of the center itself as an indicator of demand, this underestimates demand because people in surrounding rural areas also utilize functions in the centers. A better approach is the use of total service area population as an indicator of demand. Information on the areal extent of service areas may be obtained from maps, local public agencies, or surveys. Local public agencies, such as health clinics or schools, may have the addresses of people who use their services. Surveys of knowledgeable local individuals and traders may provide information on the extent of service areas. This type of survey can be combined with a survey of the supply of functions. Methods for estimating service areas are described in the next section. Once service areas are delineated, their population can be obtained from censuses.

Sometimes subpopulations are used as a measure of demand. For example, school-aged children might be the appropriate indicator of demand for primary schools. Demand for secondary

schools might be assumed to be proportional to primary school enrollment. For some functions, data based on things besides population may be more appropriate. For example, number of acres under cocoa cultivation or total cocoa production may be the appropriate measure of the demand for cocoa marketing and storage facilities.

ANALYSIS OF DATA

There are a variety of methods and techniques which can be used to analyze central place service systems. Some of these are relatively simple while others are complicated. In this section, the most useful of the simple methods are explained. Less useful and more complex techniques are mentioned and briefly discussed.

Analyzing Supply of Central Place Functions

Scalogram Matrix. This simple and effective method of analyzing the supply of central place functions was developed for the Indian Growth and Services Centers Project.¹ The method entails a number of simple steps. The number and types of functions provided by each center is determined first. Table 7.1 is an example of the types of functions normally considered. For each function, the number of centers in which it is available is also determined. Sometimes the total list of central place functions is condensed by eliminating unimportant functions.

After determination of the functions in each center and number of centers providing each function, a matrix can be formed (Table 7.1). Centers are listed across the top of the matrix in order of the number of functions provided. Functions are listed along the left edge in order of the number of centers in which they are available. Each cell of the matrix now represents a particular function which may appear in a given center. Cells which represent functions actually found in the given center are marked while the others are left blank. To refine the matrix, rows and columns can be rearranged visually to minimize the number of blank cells in the upper right and marked cells in the lower left. The final scalogram matrix provides a good description of the ordering of centers and functions in the central place hierarchy.

Guttman Scale. This technique, which is a popular social research tool, can be used to arrange central place functions in scale order. Highest order functions are at one end of the scale and lowest order or most ubiquitous functions at the other end. The coefficient of scalability indicates the consistency of the scale, i.e., the percentage of times that higher order functions are located in centers which do not provide lower order functions. Functions which are relatively inconsistent are eliminated from the scale. An inconsistent function is one which is often available in lower order centers but not supplied by higher order centers. Unfortunately, these inconsistent functions are often the ones that

CENTRAL PLACES

FUNCTIONS

	Puerto Viejo (V)	Agua Zarcas (V)	Venecia (V)	Pital (V)	Guácimo (V)	Hojancha (V)	Buenos Aires (V)	Ciudad Cortés (V)	Rapaces (V)	Bataán (V)	Filadelfia (V)	Siquirres (IV)	Palmar (V)	Nicoya (IV)	Cañas (IV)	Curupiles (IV)	San Isidro (III)	Limon (III)	Ciudad Quesada (III)	Liberia (III)	Carago (II)	
Food retail	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Non food retail	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Banks	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Restaurant/bar/snack shop	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Primary school	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Coops/unions/chambers	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Religion	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Secondary schools	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Political administration	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Wholesaler/distributor (non-agric.)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Health administration	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dispensary/clinic/center	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Professional agricultural services	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Police/fire/justice	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Red Cross/charity	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Transportation/communication (govt.)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Transportation/communication (priv.)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Construction	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Unspecified companies	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Hotels/lodging places	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Agricultural agencies	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Professions/trades	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Repairs/workshops	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Manufacturing/industry	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Agricultural extension	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Agricultural suppliers	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Processing/agroindustry	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Education administration	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Social service non-health	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Farms	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Non-food service	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Pharmacies	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Hospitals	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Public utilities	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Other health-related	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Private dental facilities	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Entertainment	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Private utilities	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sports/social club or center	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Private medical facilities	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Agricultural administration/research	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Insurance	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
University	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Clinical laboratory	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Economic/regional development	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Special education	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Political parties	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Migration/customs	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Other	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Function present Function absent

Figure 7.1 SCALOGRAM FOR SELECTED CENTRAL PLACES IN COSTA RICA
 Source: Mary Cameron Kilgour, "The Telephone in the Organization of Space for Development," PhD Theses (Cambridge, MA: Harvard University, 1982), page 165.

are important to rural development, such as farm credit and farm supply outlets. This limitation, and the technical complexity of Guttman scaling, suggest that it is usually less appropriate than the simpler scalogram matrix approach.

Centrality Index. With this alternative approach each function is assigned a weight equal to one hundred divided by the number of centers in which the function is located. For example, if the function was only available in two centers within the study area, its weight would be fifty. On the other hand, if it was supplied by twenty centers its weight would be five. The centrality index of a center is the sum of the weights of each function which it supplies. This straightforward approach indicates the order of each center and function. However, centrality indexes can be misleading. For example, suppose a very small center had a relatively rare function, such as a hotel. This rare function would have a relatively large weight thus giving the center a fairly large centrality index. However, the very small center may not provide many of the basic functions usually supplied by centers with comparable or lower centrality indexes.

Identification of the Central Place Hierarchy. Centers can be classified by their level in the hierarchy. The lowest level of the hierarchy contains a large number of village centers while the highest level is comprised of one or a few large national or regional cities. The actual number of levels of the hierarchy depends on the central place system being analyzed, the analytical methods used, and the experience and judgement of the analyst. Usually, the number of centers at one level is about two to eight times the number at the next higher level. For example, if there were 200 villages, there might be about 60 market towns, 10 secondary cities and 2 regional centers.

The quickest and usually most appropriate approach is based on the number of functions provided by each center. The scalogram matrix can be inspected visually for natural break points which separate levels of the hierarchy. It is sometimes better to start at the left and go across the list of centers until places are identified which seem to have a substantially greater number of functions. This suggests a tentative break point between the lowest and next to lowest level of the central place hierarchy. The analyst then continues across the list looking for additional break points. Some analysts prefer to start this process at the right. In any case, the list usually is scanned several times and tentative break points are adjusted again and again before they seem right. The method is very dependent upon subjective judgements.

In general, there will be centers just above or below the break points. In specifying the hierarchy level of these centers a number of factors should be considered such as the location of the center, the population and size of its service area, the population and recent growth of the center itself, and the mix of functions

which it provides. If a center, close to the hierarchy break point, is located relatively near other centers at equal or higher levels of the hierarchy, then it will have a fairly small service area. This suggests that the center should be placed in the lower level. Other factors suggesting placement in the lower level include small population size, slow growth, and provision of functions which are not deemed important to area development. On the other hand, factors suggesting placement in the level above the break point include large size and population of service area, provisions of key functions needed for area development, as well as relatively large and growing population of the center itself.

As the discussion above suggests, identification of the hierarchy normally involves considerable intuitive judgement and common sense. By working with scalogram and mapped patterns of centers, the analyst acquires greater familiarity and understanding of the central place system. Though hierarchies have been identified using complex computerized methods such as principal components and cluster analysis; these require considerable technical and data processing resources and supply results which decision makers may neither understand nor trust. In addition, complex computerized methods usually do not provide analysts with the familiarity and understanding gained from manual methods.

Analyzing Demand for Central Place Functions

Techniques for analyzing demand for central place functions are concerned primarily with identifying service areas and determining their populations.

Service Area Mapping. A variety of different mapping techniques can be used to investigate service areas. Separate maps can be developed for each level of the hierarchy. Higher order centers provide the functions of lower order centers and therefore should be included on the maps of lower order centers. For example, the map for the lowest level should include all centers in the system; the map for the next highest level should include all centers except those at the lowest level, etc. After centers are located on maps, delineation of service area boundaries can begin. The easiest method is to assume that rural populations are served by their nearest center. Under this assumption, boundaries bisect lines connecting centers and the resulting patterns may look like Figure 7.2A. These boundaries may be adjusted subjectively using information on road networks, paths, waterways and natural barriers (Figure 7.2B).

A similar approach is based on Reilly's law of retail gravitation.² This method assumes that rural people generally travel farther to obtain functions from larger centers than from smaller ones. The method begins by using Reilly's law to calculate the boundary points between each pair of neighboring centers. The boundaries then are adjusted using road networks, etc. This technique, which requires considerably more work, is only

marginally better than the simple method discussed above and therefore is not recommended in most cases.

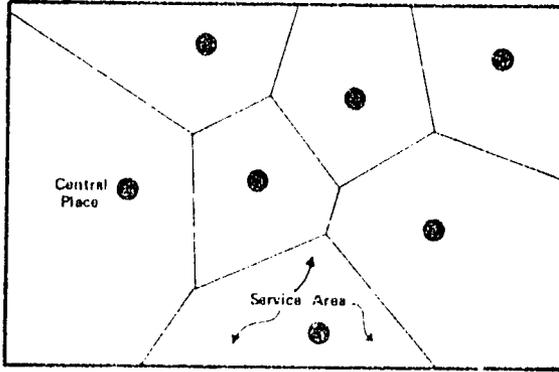
A better technique for delineating service area boundaries is based on actual patterns of utilization. Utilization information may come from surveys of either the rural population or those who provide the functions. Actual utilization patterns can be mapped by drawing lines from the location of rural populations to the centers they patronize (Figure 7.2C). The map may reveal that service areas overlap or that some rural areas do not obtain functions from any center and therefore are not served by the central place system. In delineating service boundaries, analysts attempt to draw boundaries which minimize the amount of overlap and reveal unserved areas (Figure 7.2C).

Estimating Service Area Populations. After service area boundaries are delineated, service area populations can be estimated using census data. The service area populations indicate the threshold population needed to support centers at various levels of the hierarchy. This information can be added to the scalogram matrix or used in the design of interventions.

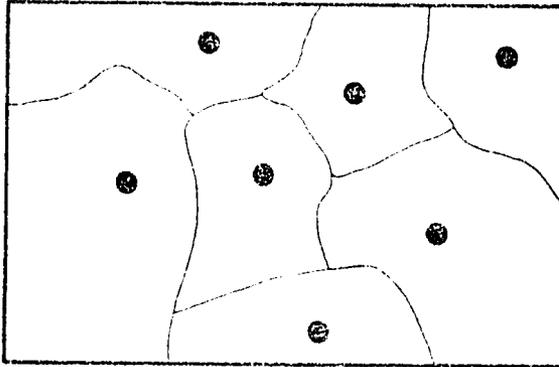
Analyzing Individual Functions. Though the proceeding discussion focuses on analysis of centers at each level of the hierarchy, the methods discussed also can be used for individual functions. The focus on functions is more involved but usually more relevant to specific development interventions. Analysis can reveal areas which are without essential functions needed for development. The threshold population needed for specific functions can be estimated and then used to identify areas which can support key new functions. Generally, the analysis is limited to those functions which are basic to proposed development interventions such as agricultural storage, marketing and processing; supply of farm inputs; schools; health centers, and other public services.

Marshall has proposed a shortcut methods for estimating the threshold population needed to support a specific function.³ The technique relies on data contained in a preliminary scalogram matrix. The method assumes that the threshold population is the size of the center for which the number of larger centers without the function is equal to the number of smaller centers with the function. The method is quick, but usually underestimates threshold population because rural portions of service areas are ignored. To avoid this problem a new scalogram matrix can be developed using total service area population instead of the population of the center only. While the Marshall procedure is appropriate for most situations, sometimes threshold populations are adjusted according to population density. In general, the influence of scale economies results in higher thresholds in more densely populated areas.

A. Assumption that rural populations served by nearest center.



B. Boundaries adjusted for road networks, paths, waterways and natural barriers.



C. Boundaries based on actual utilization patterns.

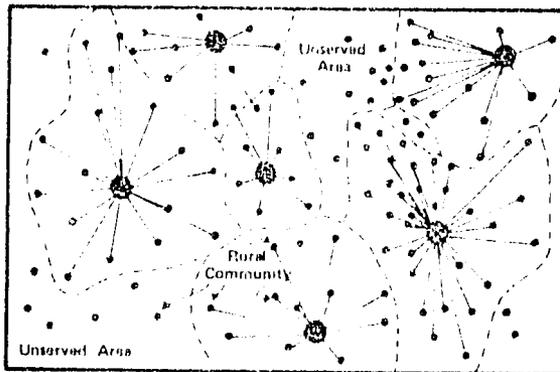


Figure 7.2 DELINEATION OF SERVICE AREA BOUNDARIES.

Planning Improved Central Place Systems

The descriptive analytical methods discussed so far are basic to understanding central place systems and identifying areas in need of improvement. Relatively new proscriptive techniques are available for improving central place services. These techniques identify the locations for new functions which result in the greatest improvement in service provision. Such methods are commonly referred to as location-allocation techniques.⁴

Location-allocation methods can design improvements to spatial systems which minimize the average distance that rural populations must travel to their nearest service center. In other words, rural accessibility to centers is maximized. Comparisons between the existing system and distance-minimizing systems indicate the spatial efficiency of the existing system. Equity issues can also be addressed; for example, techniques exist for determining the minimum number and location of new service supply points which assure that every rural community is within a set distance, say twenty kilometers, of a service center. The efficiency and equity objectives may be combined. For instance, methods can identify the locations of new service centers which maximize accessibility while assuring that everyone is within a set distance. Though location-allocation methods usually require sophisticated computer processing systems, manual methods have been developed and applied to location problems in the Indian context.⁵

A combination of methods and factors should be considered when investigating proposed improvements to central place systems. For example, hierarchy analysis and mapping may reveal that some regions have a definite shortage of market towns. This situation provides an opportunity for making investments in villages which have been selected for development to market town status. Several criteria should be used in deciding which villages should be selected. First, selected villages should exhibit potential for growth and development by exhibiting rapid past growth. Second, market towns should be located so as to maximize spatial efficiency or equity. Manual or computer location-allocation methods can select those village centers with development potential which best improve the spatial efficiency and equity of the system. Third, political realities must be considered. Fourth, attention should be paid to the views and development priorities of the local population in relevant villages. Analysts, planners, and other decision makers must weight carefully all of these factors before selecting villages for the proposed development activity.

SOURCES OF FURTHER INFORMATION*

- * Johnson, E. A. J. The Organization of Space in Developing Countries (Cambridge, Massachusetts: Harvard University Press, 1970, 452 pp.). Central place theory is presented and central place studies are reviewed. Relationships between

the theory and development interventions are discussed. Emphasis is placed on market towns and their role in agricultural development. Numerous examples are provided.

- * Gould, William I. S. "Guidelines for School Location Planning," World Bank Staff Working Paper No. 308 (Washington: IBRD, 1978, 103 pp.). Presented are detailed methods for using threshold, range, and other concepts in school location planning. Data needs and sources are discussed. Four case studies are included.
- * Rondinelli, Dennis A. and Kenneth Ruddle. Urbanization and Rural Development: A Spatial Policy for Equitable Growth (New York: Praeger, 1978, 221 pp.). This book is an excellent source of background material on analysis of central place systems and urban-rural linkages. Examples from several countries indicate the types of services and functions provided at each level of the central place hierarchy. Appropriate methodologies and data requirements are discussed.
- * Roy, Prodipto and B. R. Patil, eds. Manual for Block Level Planning (Delhi, India: MacMillan Company of India, 1977, 124 pp.). This manual describes methods and techniques for analyzing and planning service centers. Data collection techniques are described.
- * Smith, Carol A., ed. Regional Analysis: Volume I, Economic Systems (New York: Academic Press, Inc., 1976, 370 pp.). Presented are numerous empirical analyses of central place and periodic marketing systems. Provided are case studies from Ecuador, Ghana, Peru, Taiwan, Guatemala, and China.

Beenhakker, Henri L. and Adderraouf Chammari. "Identification and Appraisal of Rural Roads Projects," World Bank Staff Working Paper, No. 362 (Washington: IBRD, 1979, 74 pp.). Paper presents and discusses methods for estimating the benefits of proposed improvements in farm to market roads.

Berry, Brian J. L. Geography of Market Centers and Retail Distribution (Englewood Cliffs, New Jersey: Prentice Hall, 1967, 146 pp.). Presented are central place theory and numerous detailed empirical studies of central place systems. Most of the examples are drawn from the United States.

Grove, D. and L. Huszar. The Towns of Ghana (Accra, Ghana: University Press, 1964). Presented is an excellent analysis of the Ghanaian central place system.

Marshall, John U. The Location of Service Towns (Toronto: University of Toronto Press, 1969). Central place theory and

empirical studies are reviewed. Analytical methods are presented.

Rondinelli, Dennis A. "Bicol River Basin Urban Functions in Rural Development Project: Summary and Evaluation," Prepared for Office of Urban Development, U.S. Agency for International Development, Contract No. AID/ta-c-1356 (Washington, D. C., USAID, 1978, 64 pp.). This report describes a case study analysis of a central place service system in the Philippines. Analytical methods and techniques are described in detail.

Sen, Lalit K., et al. Planning Rural Growth Centers for Integrated Area Development: A Study in Miryalguda Taluka (Hyderabad, India: National Institute of Community Development, 1971, 245 pp.). This excellent central place case study includes theoretical framework, study design, methodology, identification of gaps in the system, and proposals for integrated area development.

Sen, Lalit K., et al. Readings on Micro-Level Planning and Rural Growth Centers (Hyderabad, India; National Institute of Community Development, 1972, 352 pp.). The focus is on the role of service centers in development planning. The forty articles touch on all aspects of service centers and rural development.

Wanmali, S. Regional Planning for Social Facilities: An Examination of Central Place Concepts and Their Application: A Case Study of Eastern Maharashtra (Hyderabad, India: National Institute of Community Development, 1970, 89 pp.). This case study presents a detailed analysis of an Indian central place system.

NOTES

1. C. P. Andrade, S. Banerji, H. S. Fisher, G. Rushton, N. S. Saini, and A. Sharma, "A Graphical Approach to Settlement Planning for Integrated Area Development Planning," mimeographed, no date. H. Benjamin Fisher, "Methods for Identification of Agra-Urban Centers at the Kabupaten and Provincial Levels," mimeographed (Jakarta: Ford Foundation, 1975).
2. W. J. Reilly, The Law of Retail Gravitation (New York: Knickerbocker Press, 1931).

* Particularly good sources for further information.

3. John U. Marshall, Location of Service Towns (Toronto: University of Toronto Press, 1967).
4. A. C. Lea, "Location-Allocation Models: A Review," (Toronto: University of Toronto, Department of Geography, 1973).
5. Gerard Rushton, Michael F. Goodchild and Lawrence A. Ostresh, eds., Computer Programs for Location-Allocation Analysis, Monography 6, Department of Geography, University of Iowa, Iowa City, Iowa (1973). H. B. Fisher and G. Rushton, "Rural Growth Centers: Experience in the Pilot Research Project, 1969-1974," In Man, Culture and Settlement, Essays in the Honour of Professor R. L. Singh, R. C. Eldt, K. N. Singh and R. P. B. Singh, eds. (Bombay, 1976). S. Banerji and H. B. Fisher, "Hierarchical Location Analysis for Integrated Area Planning in Rural India." Papers of the Regional Science Association, 33 (1974).

Part 4

Urban Analysis

PREVIOUS EDITIONS

8

Urban Administration and Delivery of Public Services

The quality of life in urban areas is related to the delivery of public services such as potable water, waste disposal, health care, education, public markets, etc. Such services often are the responsibility of local government. Unfortunately, local government revenues have not kept pace with accelerating urbanization and rapid increase in demand for public services. This growing imbalance is a key issue in cities of developing countries. Local revenue authority, which varies considerably from country to country, is generally inadequate to meet local needs.

A variety of different approaches have been used to address the problem of insufficient local revenues. Central governments have increased direct transfers or granted additional revenue-generating authority to local government. Responsibility for provision of some services has been shifted to national or regional governments or to autonomous public agencies with adequate authority. Attempts have been made to increase revenues by more efficient utilization of existing authority. Unfortunately, these approaches rarely have produced sufficient funds and quality of service has remained at low levels.

The supply of public services is dependent upon the capability of local agencies. Such agencies often have difficulty attracting qualified personnel; salary and prestige levels are frequently low; and high turnover rates adversely influence staff efficiency. Unfortunately, many central governments cannot provide the type of technical assistance needed by local agencies; thus they often lack effective managerial capacity.

The degree of commitment to social equity influences delivery of services to low income groups. Upper income groups generally have more political power than poor people and therefore often receive better service. In some cases public servants have little regard for equity considerations: they may attempt to provide each social class with a level of service appropriate to their position. Legal considerations also may influence service delivery; for example, service may be withheld from people living in illegal squatter settlements. Social equity concerns are becoming more important and are beginning to have an effect on the provision of public services.

This chapter focuses on the analysis of public service delivery. Methods are presented for evaluating delivery systems, investigating local public agencies, and assessing the efficiency and equity of delivery and revenue generation. Other chapters provide information and techniques which may be useful. Chapter Seven discusses public services supplied by centers to their rural hinterlands and Chapters Nine, Ten, and Eleven address services related to employment, urban land use and transportation, and housing, respectively.

RELEVANCE TO DEVELOPMENT INTERVENTIONS

Almost every development intervention involves either local governments or other agencies involved in public service delivery. Many projects involve improved supply of health care, family planning, education, potable water, waste disposal, electricity, street improvement and the like. Other projects, such as housing, employment, and increased production, involve local government or public agencies either directly or indirectly. The success of such activities is dependent upon an understanding of service agencies. Methods described in this chapter are designed to provide this understanding.

Analysis of public services is also relevant to development interventions which focus on the urban poor. An analysis of public service delivery to the urban poor may reveal that inadequate access is a key constraint to their development. A comparison of public service benefits with contributions to public revenues shows the degree of progressivity or regressivity in the service delivery system. Such a comparison may indicate potential opportunities for projects which improve public service delivery to the urban poor. Of course, development interventions which begin with a focus on the urban poor also should include a *micro* analysis of their socioeconomic characteristics (Chapter Four).

Analysis of urban administration may reveal needed improvements which can form the basis for development interventions. For example, analysis might indicate that local governments are not fully exploiting revenue generation authority or are using ineffective budgeting and fiscal management techniques. Resulting interventions might involve technical assistance or training programs. Possible activities to increase revenue collections might be improved cadastral surveys, reassessment of property values, or more efficient user fee systems. In a number of Latin American countries, analysis of local government administration has led to the formation of national level municipal development institutes.¹ These provide a variety of technical and financial assistance to local municipal governments.

TYPICAL QUESTIONS

- o What is the de facto and de jure distribution of authority between national and local government? What

impact does this have on urban administration and delivery of public services? How sympathetic is national government to the needs of local government? What is the difference between the amount of revenue collected by national and local government?

- o What financial or technical assistance is provided by national government to local government? Are intergovernmental transfers sufficient?
- o What are the characteristics and quality of urban public service delivery? Which agencies deliver these services? Who pays for the services? Do specific service standards exist? Are they realistic?
- o Is there overlap in the responsibilities and activities of public service agencies? Are their objectives and activities complementary or conflictory? How are conflicts resolved? What mechanisms exist for interagency coordination?
- o What is the formal and informal structure of local government and public agencies? What political and other groups influence decisions? What management practices and decision making criteria are used? What is the status of urban development planning? Are development plans consistent with projected revenue levels?
- o What is the level of technical competence in local government and other service delivery agencies? How is this level influenced by salary and prestige levels?
- o What budgeting and accounting practices are used? How effective are they? What auditing regulations exist? How often are audits conducted?
- o What are the revenue sources of public agencies? What sources of credit do they have? Are all sources fully utilized? What new local revenue sources can be identified? What has been the growth of major revenue sources in recent years?
- o How effective are local tax assessment and collection procedures? What is the ratio of collection costs to revenues? What penalties exist to enforce tax collections? How progressive is the tax system?
- o What user fee systems are utilized? What criteria are used to establish fees? Do fees cover both fixed and variable costs? Can user fees be increased? Do

connection charges prevent poverty groups from utilizing services?

- o What are the distributional characteristics of local administration and service delivery? What differences are there in the level of service received by different socioeconomic groups? What is the efficiency and equity of local taxation, expenditure, and user fee policies? How much do the urban poor contribute to local revenues? How much do they benefit from local expenditures?
- o How committed are local governments and public authorities to assisting the poor? Are they involved in projects specifically designed to help the poor? To what extent do the poor participate in urban government? What influence do they have in decisions concerning expenditures or public service delivery?

DATA SOURCES

National government and local agencies are the two most common sources of data on urban administration and delivery of public services. Additional information may be available from national universities and international development agencies.

Data from National Government

Some of the relevant sources of information available from national government are listed below.

Official Documents: Constitution, legislation, decrees, etc. provide background information on the distribution of functions and authority among various levels of government.

Censuses: Population censuses normally include indicators of access to public services such as school enrollment, connections to electrical, water, or sewer systems. However, census information may be out-dated.

Reports of National Agencies: Published and unpublished reports may contain information on the provision of such public services as education, health care, potable water, sewerage, waste treatment, streets and roads, employment, and housing.

Interviews with National Agency Personnel: This approach can supply detailed information on specific public services.

Files of National Agencies: If access is granted, files may provide detailed information on a variety of services.

Budgets of National Agencies: Budgets indicate expenditures and revenues for specific services.

There are both advantages and disadvantages to using data from national sources. The data are readily available and easy to collect. The fact that they normally are based on consistent reporting practices facilitates comparisons between different towns and cities as well as between different service provision agencies. On the other hand, national level data may not include sufficient detail for the purposes of the analysis. The data for all towns and cities in a region may be combined. Breakdowns usually are not available for level of service provision in different areas within cities. National sources may not include information on services which are provided solely by local governments or by private enterprises. For example, national sources generally do not contain data on transportation or other services provided by the informal sector. Despite these limitations, information from national agencies provide a good starting point.

Data from Local Agencies

Detailed data can be obtained from local governmental bodies and public service agencies. Periodic or annual reports may indicate staffing levels, capital and operating expenses, revenue levels and sources, as well as general information on activities and methods of operation. The information from reports can be augmented by mailing questionnaires to directors of agencies. In many cases, personal interviews may be preferable because they are more flexible and avoid problems associated with unclear items on mailed questionnaires. Furthermore, by travelling to the local areas of interest, analysts can observe local service delivery in action. First hand impressions may reveal information concerning the equity of service provision and attitudes toward the urban poor. Informal household surveys can provide data on the characteristics of service delivery and user satisfaction. Surveys are discussed in greater detail in Chapter Four, Micro Analysis of Beneficiary Groups.

ANALYSIS OF DATA

Often appropriate data on urban administration and delivery of public services are nonquantitative and thus not easily amenable to usual statistical methods. In many cases descriptive answers to key questions may constitute the most useful form of analysis. In this section a number of nonquantitative analytical approaches are discussed.

Matrix Inventories

Information on all or a group of services in one city can be presented in simple matrix format.² Separate matrices can be

developed which indicate interrelationships among agencies, public services provided, and revenue sources. Examples of these types of matrices are provided in Figure 8.1. By using appropriate symbols, the matrices can indicate interrelationships among agencies. Different symbols can be used in the matrix to indicate the nature of responsibility such as planning, development, construction, operation, or maintenance (Figure 8.1). The matrices present a concise framework for identifying the basic structure of public services in a city. They can reveal overlaps and gaps in the service provision system. Each of the three matrices can be used to assess the impacts of proposed projects by including a row and column for the project (Figure 8.1). These rows and columns indicate direct and indirect interactions between the proposed project and existing agencies, services, and revenues. Also, the key interrelationships identified in the matrices can be used to direct subsequent data collection and analysis. Efforts can be made to quantify important interrelationships. In addition, recent changes and trends in the relationships between agencies, services, and revenues can be investigated.

Indicators of Public Service Provision

Analysis of individual services generally requires the selection of appropriate indicators.

Input and Output Indicators. Input indicators describe agency resources and their utilization; they do not necessarily measure the quality of service delivery. Examples include expenditures, personnel, facilities, and equipment. The quantity or quality of service actually delivered may be reflected in output indicators; for example, number of students passing standardized examinations or amount of electricity delivered. By combining input and output indicators, information can be obtained on efficiency. Examples of efficiency indicators are feet of streets paved per worker, gallons of water delivered per unit expenditure, and amount of trash collected per collection cart. Comparison of indicators for different cities can reveal the relative effectiveness and efficiency of different service delivery systems. Comparison may reveal which services in which cities are in need of technical or financial assistance.

Equity Indicators.³ Measures of service delivery equity can be developed by subdividing the population into income classes and investigating the level of services provided to each class. The simplest approach is to compare input or output indicators for different neighborhoods or other spatial units. Appropriate indicators may include: percentage of households with water, sewer, or electrical connections, or per capita expenditures on drainage or road improvement. Comparisons may reveal that some areas receive substantially higher levels of service than others. The results of equity analyses may indicate that special programs or incentives are needed to insure that poverty groups obtain adequate access to public services.

AGENCIES	FUNCTIONS							
	PORT PROJECT	WATER	SEWAGE	POWER	TRANSPORT	HOUSING	EDUCATION	URBAN PLANNING
Port Project				DC	DC			IC
NATIONAL GOVT.	DC			X		25%	P	20%
Transport Min.	DC				P			
REGIONAL GOVT.					I,M	10%		
Planning Board	IC							30%
LOCAL GOVT.	IC					15%	I,M	50%
Water Dept.		X						
Sanitation Dept.			X					
AUTONOMOUS AGENCIES						10%		
Port Authority	DC				I,M			
PRIVATE SECTOR						40%	I,M	
Bus Company								

LEGEND

- X = Total Responsibility
P = Planning
I = Implementation
M = Maintenance
A = Revenue Authority
R = Revenue Source

AGENCIES	REVENUES							
	PORT PROJECT	NATIONAL TRANSFERS	REGIONAL TRANSFERS	INCOME TAX	SALES TAX	USER CHARGES	FEES, LICENSES	BORROWING
Port Project		DC				DC	IC	DC
NATIONAL GOVT.	DC			A	A		A	A
Transport Min.	DC					A	A	
REGIONAL GOVT.		A		A				A
Planning Board	IC	50%	50%					
LOCAL GOVT.	IC	15%	10%			40%	10%	25%
Water Dept.		20%				80%		
Sanitation Dept.		50%				50%		
AUTONOMOUS AGENCIES								
Port Authority	D	40%				20%		40%
PRIVATE SECTOR								
Bus Company	IC					100%		

PROJECT

- DC = Direct Connection
IC = Indirect Connection

Percentages sum across Agencies in top figure and across Revenues in middle figure.

REVENUES	FUNCTIONS							
	PORT PROJECT	WATER	SEWAGE	POWER	TRANSPORT	HOUSING	EDUCATION	URBAN PLANNING
Port Project				DC	DC	IC		IC
National Transfers	DC	R	R	R	R	R	R	R
Income Tax								
Sales Tax								
User Charges	DC	R	R	R	R	R		
Fees, Licenses	IC				R	R		
Borrowing	DC	R	R	R				

FIGURE 8.1 MATRICES OF AGENCIES, FUNCTIONS, AND REVENUES

Analysis of Service Delivery Agencies

Analysis of service delivery agencies can begin with a listing of important agency characteristics such as:

- agency purpose
- legal basis and brief history
- organizational structure
- expenditure patterns and revenue sources
- number, type, and capability of employees
- characteristics of leadership
- general operating procedures
- equipment and facilities
- commitment to low income groups
- linkages with other local and national agencies

Items on the list can be selected for detailed analysis; for example, within operating procedures the investigation could focus on decision making practices and criteria, budgeting and accounting methods, planning capacity and approach, or influence of political groups on expenditure decisions. A focus on employees could investigate salary and prestige levels, amount of experience and training, work habits and efficiency, incentives and motivations, or satisfaction and morale. Analysis can seek to identify aspects of agencies which can be improved.

Analysis of Revenue Sources. The primary source of local revenue is property taxation; this is particularly true of areas which were under British influence. Analysis of property tax systems can focus on tax assessment and collection practices, ratios of collection costs to revenues, and progressivity. Studies of tax progressivity require estimation of tax incidence. A number of different analytical approaches have been developed for investigating property tax incidence.⁴ The approaches vary with respect to the assumptions made about the supply of both urban land and capital and the proportion of taxes passed from landlords to renters. Current thinking suggests that property taxation is generally progressive; however, this is strongly dependent upon the administration of the tax. Analysis of property tax systems may identify ways to improve the tax or increase the amount of tax collected.

Local revenues can be generated using betterment taxes or valorization charges.⁵ Betterment is increases in property values arising from government actions such as street improvement or sewer extensions. The property betterment may be taxed at the time the land is sold or at the time the improvement is made. The latter practice usually is called a valorization charge. Methods of determining taxes and collection procedures can be investigated to determine their efficiency and equity.

Another common source of revenue is user fees such as those charged for the consumption of water or electricity. User fees can be compared with the actual cost of service provision. Collection

procedures and metering systems can be investigated. Comparisons of connection charges with usage rates may reveal equity characteristics. If connection charges are high, then low income groups may be prevented from utilizing the service.

Projections of Future Revenues and Expenditures.⁶ Analysis of service agencies can include projections of revenues and expenditures. Projections, which can be made for periods up to five years, indicate future deficits or surpluses. Revenue projections are based on past revenue levels as well as estimates of tax base growth, intergovernmental transfers, and expected new revenue authority. Expenditure projections can be obtained by extrapolating historical expenditure patterns. Such projections can be adjusted to account for inflation, changing expenditure patterns, expected capital expenditures, productivity increases, and different policy alternatives.

SOURCES OF FURTHER INFORMATION*

- * Bird, Richard. "Intergovernmental Fiscal Relations in Developing Countries," World Bank Staff Working Paper No. 304 (Washington: IBRD, 1978, 100 pp.). The paper is designed to assist planners with investigations of intergovernmental fiscal relations in the context of urban public service analysis. Provided are a literature review, measurement of fiscal decentralization, alternative conceptual frameworks, policy objectives and instruments, and other topics.
- * Herbert, John. Urban Action in the Third World: Guidelines for the Formulation of Projections (New York: Praeger, 1979). This book focuses on provision of numerous urban services including water supply and sanitation, health, education, housing, transportation, and employment. A chapter is dedicated to urban management and finance.
- * Institute of Public Administration, New York, Project on International Urban Studies. This project studied urban management and urban finance in several cities. The studies investigate intergovernmental relationships, management capability, financial resources, selected public services, and planning capacity. Some of the publications from this project are listed below.
 - o Austin, A. G. and S. Lewis. Urban Governments for Metropolitan Lima (New York: Praeger, 1970).
 - o Cannon, M. W., R. S. Foster, and R. Witherspoon. Urban Government for Valencia, Venezuela (New York: Praeger, 1973).
 - o Johnson, K. M. Urban Government for the Prefecture of Casablanca (New York: Praeger, 1970).

- o Richardson, I. L. Urban Government for Rio de Janeiro (New York: Praeger, 1973).
- o Williams, B. A. and A. H. Walsh. Urban Government for Metropolitan Lagos (New York: Praeger, 1967).
- o Walsh, A. H. The Urban Challenge to Government (New York: Praeger, 1969).
- o United Nations. "Administrative Aspects of Urbanization," Department of Economic and Social Affairs, ST/TAO/M/51 (New York: United Nations, 1970, 228 pp., Sales No. E.71.11.H.1).
- * Linn, Johannes F. "The Distributive Effects of Local Government Finances in Colombia: A Review of the Evidence," World Bank Staff Working Paper No. 235 (Washington: IBRD, 1976, 46 pp.). In this exemplary case study, the institutional framework of local government is described and the incidence of local taxes and public expenditures assessed. The methodology used is described in detail.
- * Linn, Johannes F. "The Incidence of Urban Property Taxation in Developing Countries: A Theoretical and Empirical Analysis Applied to Colombia," World Bank Staff Working Paper No. 264 (Washington: IBRD, 1977, 106 pp.). Reviewed are different approaches to analysis of urban property tax incidence in developing areas. These approaches are utilized in an empirical analysis of Colombia. The final section presents and evaluates a new analytical framework for analysis of property tax incidence.
- * Lucy, William H. and Kenneth R. Mladenka, Equity and Urban Service Distribution, The Urban Management Curriculum Development Project (Washington, D.C.: The National Training and Development Service, 1978, 150 pp.). A number of issues concerning equity and public service delivery are discussed. Presented is a methodological framework for analyzing urban service distribution. Hypothetical examples of urban service provision in America are provided.
- * McLure, Charles E. "Taxation and the Urban Poor in Developing Countries," World Bank Staff Working Paper No. 222 (Washington: IBRD, 1976, 26 pp.). This paper examined the procedures used in estimating the incidence of taxation in developing countries. Empirical evidence of the tax burden of the urban poor is reviewed and analyzed.
- * Merman, Jacob. "Meeting Basic Needs in Malaysia: A Summary of Findings," World Bank Staff Working Paper No. 260 (Washington: IBRD, 1977, 52 pp.). A new methodology is presented for identifying the distributive impacts of public

expenditures. The methodology employs Malaysia data on the costs of government services and a survey of the actual utilization of those services by 1,465 households. The methodology could be modified easily for analysis of urban public services.

Urban and Regional Economics Division of the World Bank has produced a number of papers on urban administration and delivery of public services. The papers include:

- o Bahl, Roy W. "Urban Public Finance in Developing Countries: A Case Study of Metropolitan Ahmedabad," 1975.
- o Bahl, Roy W., Pamela Briggs, and Roger S. Smith. "Urban Public Finances in Developing Countries: A Case Study of Metropolitan Manila," 1976.
- o Bahl, Roy W. and Michael J. Wasylenko. "Urban Public Finances in Developing Countries: A Case Study of Seoul, Korea," 1976.
- o Bird, Richard M. "Intergovernmental Fiscal Relations in a Developing Country: The Case of Cali, Colombia," 1975.
- o Bougeon-Maassen, Francine. "Urban Public Finances in Developing Countries: A Case Study of Metropolitan Bombay," 1976.
- o Bougeon-Maassen, Francine and Johannes F. Linn. "Urban Public Finances in Developing Countries: A Case Study of Metropolitan Kingston, Jamaica," 1976.
- o Lessner, Linda. "The Korean Local Government System: An Outline of the Local Decision Making Structure Affecting Urban and Rural Projects," 1977.
- o Lethoridge, N., J. Linn, and S. Whitehead. "Urban Public Finance in Project Preparation: An Operational Approach," 1977 (includes extensive 12 page bibliography).
- o Linn, Johannes F. "Education and Health Services in Metropolitan Bogota: Organization, Service Levels, and Financing," 1976.
- o Linn, Johannes F. "Property Taxation in Bogota, Colombia," 1976.
- o Linn, Johannes F. "Public Transportation and Housing in Bogota: Organization, Service Levels, and Financing," 1976.

- o Linn, Johannes F. "Urban Public Finances in Developing Countries: A Case Study of Cartagena, Colombia," 1975.
- o Linn, Johannes F. "Valorization in Bogota: Organization and Financing," 1976.
- o Linn, Johannes F., Roger S. Smith, and Hartojo Wignjowijoto. "Urban Public Finances in Developing Countries: A Case Study of Jakarta, Indonesia," 1976.
- o Prud'homme, Remy. "Urban Public Finance in Developing Countries: A Case Study of Metropolitan Tunis," 1975.

Deobele, William A. and Orville F. Grimes. "Valorization Charges as a Method for Financing Urban Public Works: The Example of Bogota, Colombia," World Bank Staff Working Paper No. 254 (Washington: IBRD, 1977, 83 pp.). Presented is a methodology for allocating the cost of public services to properties in proportion to the benefits conferred.

Grimes, Orville F. "Urban Land and Public Policy: Social Appropriation of Betterment," World Bank Staff Working Paper No. 179 (Washington: IBRD, 1974, 90 pp.). A comprehensive discussion is provided of betterment taxes.

Linn, Johannes F. Cities in Developing World: Policies for Their Equitable Growth, Published for the World Bank (New York: Oxford University Press, 1982, 352 pp.). This comprehensive policy study of urban administration considers public investment, pricing, taxation and regulation as applied to problems of urban education, health care, nutrition, family planning, transportation, housing, employment, and income redistribution.

Macon, Jorge and Jose Merino Manon. Financing Urban and Rural Development Through Betterment Levies: The Latin American Experience (New York: Praeger, 1977, 147 pp.). Presented is a conceptual framework for betterment taxes and a review of experiences in eleven countries.

Robson, William A. and D. E. Regan. Great Cities of the World: Their Government Politics and Planning (London: George Allen & Unwin Ltd., 1972). Discussions are provided of urban finance, service delivery, and planning for numerous large third world cities: Buenos Aires, Cairo, Calcutta, Delhi, Ibadan, Manila, Mexico City, and Rio de Janeiro.

Scott, Ian. Urban and Spatial Development in Mexico, Published for the World Bank (New York: Oxford University Press 1982, 320 pp.). This analysis of public services in large Mexican cities includes housing, employment, mass transit, rural-urban integration, and centralization.

NOTES

1. Pirie M. Gall, Jack C. Corbett, Harry C. Carr, David J. Padilla, Jr., Municipal Development Programs in Latin America: An Intercountry Evaluation (New York: Praeger, 1976).
2. N. Letherbridge, J. Linn, and S. Whitehead, "Urban Public Finance in Project Preparation: An Operational Approach," Urban and Regional Economics Division (Washington: IBRD, 1977), mimeo.
3. William H. Lucy and Kenneth R. Mladenka, Equity and Urban Service Distribution, Urban Management Curriculum Development Project (Washington, D. C.: National Training and Development Service, 1978).
4. Johannes F. Linn, "The Incidence of Urban Property Taxation in Developing Countries: A Theoretical and Empirical Analysis Applied to Colombia," World Bank Staff Working Paper No. 264 (Washington: IBRD, 1977).
5. Orville F. Grimes, "Urban Land and Public Policy: Social Appropriation of Betterment," World Bank Staff Working Paper No. 179 (Washington: IBRD, 1974). William A. Doebele and Orville F. Grimes, "Valorization Charges As a Method for Financing Urban Public Works: The Example of Bogota, Colombia," World Bank Staff Working Paper No. 254 (Washington: IBRD, 1977). George Macon and Jose Merino Manon, Financing Urban and Rural Development Through Betterment Levies: The Latin American Experience (New York: Praeger, 1977).
6. Letherbridge, et al (See note 2 above).

* Particularly useful sources of further information.

9

Urban Employment

The waste of productive human resources resulting from unemployment and underemployment is one of the most serious problems facing third world countries. The ability of rural areas to absorb additional labor has been outpaced by rural population growth. In response, labor has migrated to urban areas in search of employment. The ever increasing supply of urban labor, fed by both migration and natural increase, far exceeds demand; thus very high rates of urban unemployment and underemployment are commonplace.

Several generalizations can be made concerning the characteristics of the urban employment problem.¹ A number of studies indicate unemployment rates for urban natives are at least as high as those for recent migrants. Urban unemployment rates may range up to twenty-five percent, rates of ten percent are observed for most areas. Unemployment rates should be cautiously interpreted because sometimes they only refer to formal sector employment. In actuality, most of those classified as "unemployed" are engaged in some type of marginal economic activity in the informal sector. Urban unemployment rates are about twice as high for those in the fifteen to twenty-four age group. Rates tend to be higher for females. It is interesting to note that unemployment rates are higher for those with four to ten years of education than for illiterates. Evidently those with some education often are unwilling to take low status jobs which commonly are held by illiterates. Those who do take jobs below their education or skill level are underemployed.

Underemployment, though not as readily apparent as unemployment, is perhaps a more serious problem. A variety of different definitions of underemployment have been utilized. In general, the term refers to members of the labor force who have jobs but are either willing to work longer hours or capable of more productive work requiring higher skill levels. Examples include persons with only temporary or part-time jobs or individuals with college education working at manual jobs. Underemployment is a particularly serious problem in rural areas. Rural to urban

migration may result in a transfer of rural underemployment to open urban unemployment.

Recent efforts to improve the urban employment situation have focused on the labor intensive activities of the urban informal sector and small scale enterprises. The informal sector is so named because it does not have formal relationships with government, with the banking system, or with large commercial and industrial enterprises. The sector is characterized by: ease of entry, reliance on indigenous resources, family ownership, small scale operation, labor intensive and adapted technology, skills acquired outside the formal school system, and unregulated and competitive markets.² Attention also has been directed at formal and informal sector small scale enterprises such as: small, but modern manufacturing industries, construction, transportation, trading, as well as a variety of traditional economic activities. These enterprises are thought to be more efficient because they utilize an abundant local resource - labor, while minimizing the use of an expensive, imported resource - capital.

The types of analysis described in this chapter are designed to provide an understanding of the urban employment situation. Methods are presented for describing the characteristics of the labor force, labor demand, and the labor market in each urban center. Techniques for projecting labor supply and demand are introduced. Special attention is given to analysis of the informal sector and small scale enterprises because they appear to have the greatest potential for absorbing excess urban labor.

RELEVANCE TO DEVELOPMENT INTERVENTIONS

Every development intervention has some influence on employment. While some have only short term effects during project implementation, such as the hiring of construction workers for housing and transportation projects, others have long term impacts. Most successful interventions influence both the demand and supply for labor. Many projects are designed to increase the demand for labor; examples include agriprocessing, manufacturing, small scale enterprises, or other labor intensive activities. In contrast, some activities can have a net negative impact on employment; for instance, a modern plastic shoe enterprise may generate 200 factory jobs while driving 1,000 artisan sandal makers out of business. A variety of interventions influence the supply of labor. Health, education, training, nutrition and housing projects seek to improve social well-being and therefore upgrade the quality of labor. The point here is that a healthy, well educated and housed labor force is generally more productive than an impoverished one. Population and family planning programs have the long term effect of reducing the supply of labor.

The types of techniques discussed in this chapter are relevant to most types of development interventions. Analysis can reveal the current dimensions of unemployment and underemployment as well future prospects. Potential approaches for alleviation of problems can be identified; for example, analysis may indicate the

need for programs which assist selected small scale enterprises and thus stimulate the expansion of these labor intensive activities.

The understanding gained from the analysis may provide a means of evaluating the employment impacts of proposed projects. Some projects can be adjusted to improve their labor generation characteristics; for example, transportation, housing and other construction activities can be designed to utilize labor intensive technologies. Potential for employment generation can be used as an additional consideration for evaluating alternative development interventions.

TYPICAL QUESTIONS

- o What are the age, sex, education, occupation, and family characteristics of the urban labor force? What are current unemployment and underemployment rates? Dependency ratios? Rates of labor force participation? How do these rates differ with respect to age? Sex? Education? Occupation?
- o What are the most important constraints to increased employment? How can these be overcome?
- o What are the characteristics of urban unemployment? Does it vary from season to season reflecting an agricultural cycle? Does it vary in multi-year cycles perhaps reflecting construction and large scale capital investments?
- c How many are employed in the formal sector? In the informal sector? Small scale enterprise? What are employment growth trends in each sector? What is the extent of interaction between the formal and informal sectors? What are the characteristics of employees in each sector? Age? Sex? Education? Migration status? Income? Family situation? Ethnicity?
- o What are the characteristics of the informal sector and small scale enterprises? What do they produce? What types of technology are utilized? How are these enterprises financed? What are common interest rates? How much fixed and working capital is employed per worker? To what extent does lack of capital inhibit start-up or expansion?
- o How can the demand for informal sector production be increased? Can government procurement from the sector be expanded? What can be done to improve the quality and marketability of informal sector production?
- o What are the nature and characteristics of formal and informal labor markets? How effective are they? What

are the present and future characteristics of labor supply and demand for each important occupational category? What key factors influence supply and demand?

- o How do the locations of housing and jobs influence the functioning of the urban labor market? What is the trade area of the urban labor market? What are the characteristics of job search behavior by the urban unemployed? How does job search behavior vary with respect to sex? Age? Skill and education level? Migration status? Occupation?
- o What are the differences in wage levels between urban and rural areas? Between formal and informal sectors? Between different industries and occupations? Between workers with different levels of education and experience? How have these wage levels changed in recent years? Are current wage trends expected to continue?
- o What are the characteristics of local trade unions? How large are memberships? How much influence do unions have? In which cities are unions particularly strong or weak?
- o Does government have an explicit employment policy? How is employment influenced by government procurement? Minimum wage laws? Health and safety regulations? Subsidized credit? Education and training programs? Government hiring and salary levels? Do government incentives favor labor intensive production?

DATA SOURCES

Censuses

Censuses are often the most readily available and comprehensive source of data on urban employment. Population censuses contain considerable information on the employment structure of individual towns and cities; sometimes data even are available for neighborhoods within cities. The population census generally indicates, for each sex, working age population, labor force size, and number employed and unemployed. These data often are reported separately for each age cohort. The information can be used to determine dependency rates as well as age and sex specific labor force participation and unemployment rates.

Population census data also indicate the number of employees in each industry, in each occupation, and by employment status, i.e., employer, employee, etc. Censuses often use the International Standard Industrial Classification of all Economic Activities (ISIC)³ which provides nine industrial divisions subdivided into forty-five major groups and one hundred twenty-four

detailed industrial categories. Occupations usually are classified using the International Standard Classification of Occupations (ISCO)⁴ which includes ten major groups, seventy-three minor groups, and over one thousand specific "occupations." Employment status normally is reported using the following categories: (a) employers, (b) own-account workers (hiring no employees), (c) employees, (d) family workers, (e) members of producers cooperatives, and (f) other.

Business censuses usually are limited to formal sector enterprises and sometimes to firms with more than a certain number of employees, usually about ten. Information is presented on number of employees by age, sex, and occupation, and on production levels, assets, revenues, amount or type of capital, and level of debt. These can be updated using information from annual labor or business surveys which are particularly useful for investigating trends.

Government Agencies

Additional information related to employment often can be obtained from government ministries or departments of labor, statistics, employment, training, business, commerce, industry, or planning. Such agencies have data from a variety of sources such as censuses, special surveys, specific studies or licensing and registry records. Employment information also may be available from unions and other labor organizations.

Employment exchanges may have records on both the supply and demand for labor; however, these data should be interpreted cautiously. The number of registrants cannot be used as a direct measure of the number unemployed because not all of the unemployed register. Often those who do register already have jobs but are looking for something better. Fluctuations in the number of registrants indicate changes in the expectation of obtaining jobs through the exchanges; they do not represent actual changes in the number of unemployed. A relatively small proportion of jobs are filled through exchanges and these are rarely representative of all employment opportunities. Consequently, exchange data on filled and unfilled positions may not accurately represent the actual structure of labor demand. Despite these limitations, employment exchange data can be useful in certain situations.

Surveys

Sometimes surveys may be required, particularly for gaining information on the urban informal sector. Surveys are both time consuming and expensive. Data from past surveys should be scrutinized closely before new surveys are initiated. Surveys can focus on employees, households, or employers. Household surveys are often superior to employee surveys because they provide data on the unemployed as well as the employed. Employer surveys can provide information on existing employment patterns as well as anticipated future demand for labor. Surveys are discussed more

fully in Chapter Four, Micro Analysis of Beneficiary Groups. Detailed discussions of employment and labor force surveys are provided in other documents.⁵

ANALYSIS OF DATA

National Overview

Before conducting a detailed analysis of employment in a given city, it is a good idea to look at the general employment situation for the country as a whole. This type of background information routinely is provided in reports of labor or planning agencies. Information is supplied on the distribution of employment by sector (agriculture, industry, commerce, etc.), by occupation, by sex, by age, and by urban versus rural. In many cases, unemployment levels and rates are investigated. The contribution of each sector to the gross national product often is presented and discussed. For each sector, contribution to gross national product can be divided by number of employees to determine average sector productivity.

It is useful to look at current trends in national employment structure. Important trends may include increased participation of women in the labor force, declines in agricultural employment, high productivity gains by certain sectors, or increased unemployment for specific age-sex cohorts. Trends can be used to make rough estimates of future employment in each sector.

Government policy can have wide ranging impacts on employment. Minimum wage laws increase the cost of labor to industry and therefore can reduce employment levels. Subsidized capital, in the form of artificially low interest rates or unrealistic exchange rates, can stimulate adoption of capital intensive technology. Licensing requirements and other government regulations may discriminate against small scale and informal sector enterprises. Government procurement influences employment in different firms and industries. Export and import regulations and practices often discriminate against labor intensive enterprises. Government hiring and wage rates can distort the operation of labor markets.

After briefly describing the national employment situation, regional or city employment indicators can be compared and contrasted with each other or with national indicators. Such comparisons may reveal areas with particularly high or low unemployment rates or areas with rapid employment growth or decline in certain sectors. Spatial comparisons together with national employment indicators and trends provide a foundation for more detailed analysis of employment in individual urban areas.

Terms and Concepts

Before discussing methods of analyzing urban employment, it is useful to present some basic terms and concepts often used in

employment analysis. Communication of employment information and analysis sometimes is hampered by misuse or misinterpretation of key terms, concepts, and measures. Therefore, it is important for analysts to precisely define the terms and measures they use.

A variety of indicators are used in the analysis of urban employment. The labor force in a city is the number of people available for income producing activities. Though it is sometimes referred to as the number of economically active people, it includes both employed and unemployed workers. In general, housewives, students, retired and disabled people, and those not seeking employment are not counted as members of the labor force. The crude activity rate is the percentage of total population classified as members of the labor force. Labor force participation rates are similar except they are based on working age population; for example, percentage of population over age fifteen classified as members of the labor force. Working age population is sometimes a confusing concept because some third world children begin working as early as age five. Normally, activity and participation rates are reported separately for males and females; sometimes they even are reported for each age-sex cohort. A labor force participation rate of fifty percent for women, means that half of the women of that age group are available for employment, though many may be without jobs. Labor force participation rates are important because they indicate the proportion of population which can contribute to income producing activities.

People not in the labor force usually are dependent upon those employed. The dependency rate is defined as the number of people not in the labor force per one hundred people in the labor force. Dependency rates are related to population age-sex distributions as well as a variety of socioeconomic conditions such as education and employment norms, health services, care of elderly, and economic structures.

The labor force is composed of employed and unemployed components. The employed component includes those either at work or with jobs but temporarily absent due to illness, vacation etc. The unemployed component includes all persons above a specific age who are not working but seeking employment. Persons who are out of work but not seeking employment generally are not classified as part of the labor force and are not considered unemployed. Consequently, those who are discouraged and have stopped looking for work are not counted as unemployed; this can be a confusing aspect of unemployment statistics.

The concept of underemployment, is more difficult to measure than unemployment. There are two major categories of underemployment.⁶ Visible underemployment involves shorter than normal periods of work. Different measures of visible unemployment have been used including: percentage of workers with part-time jobs who desire full-time work; percentage of workers working less than forty or forty-eight hours per week; or percentage of workers who desire to work longer hours. Invisible underemployment which

is sometimes referred to as "disguised unemployment" involves full-time workers whose productivity or earnings are less than they could be. Examples include persons who have abnormally low earnings or whose jobs do not permit full use of their capabilities or skills. Measurement of invisible underemployment is difficult. The most common measure is percentage with incomes below the minimum wage or some other arbitrary wage level. This measure does not address people earning more than minimum wage but still not utilizing their full capability and skills. An easy to use measure of this component of invisible underemployment has not been developed.

Labor Force Inventory

Development of a labor force inventory is a relatively simple and popular approach to analysis of labor supply in an urban area. The quantity of labor supply, which is represented by the overall size of the labor force, is a function of the size of working age population and labor force participation rates. The qualitative characteristics of labor supply are described by a variety of population and employment indicators such as:

- population by age-sex cohort
- labor force participation rates
- migration, ethnic, or linguistic status
- education and skill level
- occupation
- wage rates and hours worked
- characteristics of employer (size, industrial sector, public versus private, etc.)
- employment tenure and status and
- rates of unemployment and underemployment

Analysis of variables at different time periods can reveal trends in labor force supply. Relationships between variables can be investigated by constructing and analyzing tables. For example, tables might focus on the occupations and unemployment rates of people with different education, migration, ethnic, or linguistic characteristics. Obviously, tables cannot be constructed for all combinations of labor force variables; analysts must determine which tables are needed to investigate key employment issues.

Attention often is focused on the underemployed and unemployed because they are a primary target of development interventions. Seasonal changes and long and short term trends can be assessed. Analysis of the characteristics of the unemployed might investigate age and sex distribution, education level, migration status, length of unemployment, current means of support, and previous work experience. Underemployment can be measured using data on hours worked and wage rates. It may be useful to determine the number of new, full-time jobs at minimum wage which are needed to absorb current unemployment and underemployment. This number of jobs can be expressed as a percentage of the labor force.

Job Inventory

Analysis of urban labor demand usually includes an inventory of jobs supplied by the economy. The job inventory includes a listing of current jobs by occupational category, skill level, wage rate, vacancy rate, and full-time versus part-time or temporary status. By assuming that there is excess labor in urban areas, the characteristics of labor demand can be investigated by studying current employment patterns.

Surveys of public and private enterprises may contain considerable information on labor demand. Such surveys in combination with census information can be used to develop a job inventory. The inventory can take the form of a table with types of economic activities, subdivided by occupation, in the rows and labor characteristics in the columns. The types of economic activities used in a preliminary inventory may be limited to basic sectors; however, as the analysis proceeds, more detailed categories might be used to capture more accurately the labor characteristics of each. For example, a preliminary inventory might include three categories of manufacturing: large, medium, and small. Subsequent inventories might include three size categories for each specific industry such as food processing, textiles, etc.

A number of labor characteristics can be used in the columns of the table. Basic labor characteristics include: number of current jobs, average annual percentage change in number of jobs, average wage rate, average labor turnover rate, average education level of employees, number of unfilled vacancies, average capital per job ratio, percentage utilization of existing productive capacity, estimated employment multiplier, common credit sources and rates, and degree of unionization. The choice of labor characteristics as well as types of economic activities will depend upon: the characteristics of the urban economy, the focus of the analysis, data availability, and time and money constraints of the study.

Analysis of labor demand should pay particular attention to the labor intensity of different economic activities. Often an objective of urban development interventions is the maximization of productive employment subject to a number of other objectives, constraints, and criteria. By concentrating on labor intensive activities, more employment can be generated with a given level of investment. A number of measures of labor intensity have been developed; these include: labor-output ratio, value added per worker, share of wages in value added, and capital-labor ratio.⁷ These different measures are based on a variety of different assumptions. The capital-labor ratio (the amount of capital per employee) is the most commonly used. Selection of the appropriate measure depends upon the objectives of the study, the conditions of the local economy, and data availability.

Evaluations of labor intensity can investigate direct as well as indirect employment generation. Direct employment generation is associated with new jobs in a new or expanded economic activity. For example, a new agriprocessing plant may hire 100 new

employees. Indirect employment is associated with new jobs in activities related to a new or expanded activity. In the example above, the new plant could stimulate demand for agricultural goods and therefore result in 50 new agricultural jobs. In addition, the wages paid to the 100 new agriprocessing plant workers stimulate demand for consumer goods and this might result in 100 new jobs in consumer industries. On the other hand, the new plant might eliminate 50 old jobs in traditional agriprocessing activities. In this example, 200 net jobs would be created by the new agriprocessing plant (100 at the new plant, 50 in agriculture, 100 in consumer industries, and -50 in the traditional sector). The size of the employment multiplier (ratio of net new employment to direct new employment) depends on inter-industrial linkages and the consumption patterns of new employees. In general, multipliers are highest for activities which depend on domestic inputs and have employees who utilize domestic products. Multipliers also are discussed in Chapter Six, Urban and Regional Functions and Interactions.

Small and Informal Sector Enterprises

Interventions designed to generate urban employment often focus on small scale enterprises and the urban informal sector because they are usually labor intensive and have relatively high employment multipliers. Small scale enterprises, which include informal sector activities as well as small formal sector firms, are identified by their size, which is usually measured as number of employees or amount of capital. There are four basic approaches to definition and identification of the informal sector -- namely, the sector approach, the wage approach, the firm size approach, and the formal registration approach.

The sector approach assumes that employment in the informal sector can be estimated from census data on employment in the commercial, construction, and personal services sectors. Of course, this very simple approach has obvious drawbacks. A somewhat better approach identifies informal sector employees as those in certain census occupational categories such as street vendors, construction workers, potters, bakers, domestic servants, etc. National level census tables showing amount of education by occupation can be used to specify which occupations are in the informal sector. For example, occupations which have average employee education levels of less than the national adult average might be included in the informal sector. An advantage with the sector approach is that the size of informal sector in individual cities can be estimated from census data.

With the wage approach, economically active persons earning less than the official minimum wage are assumed to belong to the informal sector. The simplicity of this approach is attractive; however, appropriate data on wages are difficult to obtain. In addition, a number of informal sector workers, such as own-account traders, earn considerably more than the minimum wage.

The firm size approach, which also has the advantage of simplicity, assumes that all firms with fewer employees than some

cutoff number are in the informal sector. With this approach the informal sector is assumed to be synonymous with the small scale enterprise sector. Often governments regularly survey firms with more than a certain number of employees. This number can be used as the cutoff and all employees not included in the survey may be assumed to be in the informal sector. The ratio of informal to formal employment may be computed from the latest census and used with data on the surveyed firms to estimate the size of the informal sector during intercensal periods. The firm size approach may be modified; for example, small professional firms might be excluded from the informal sector even though they have fewer than the cutoff number of employees.

The formal registration approach assumes that the formal sector includes all employment in firms which formally are registered with government, involved in the national social security system, or subject to minimum wage laws. All remaining employment is assumed to belong to the informal sector. With this approach, informal sector employment can be estimated during intercensal periods using government data on employment in registered firms and the ratio of informal to formal employment from the latest census.

In general, survey data are required for investigations of small scale and informal sector enterprises. While censuses may supply some information on employees, the characteristics of the enterprises themselves normally are not reported. To understand properly the dynamics of informal enterprises, a variety of information is needed. The analysis can investigate:

- employment levels
- patterns of labor utilization
- wages
- labor turnover
- production cycles and seasons
- sources and costs of raw materials
- credit need and sources
- capital requirements and utilization
- production techniques and technology
- management and decision making methods
- interactions with government and other formal and informal enterprises
- past growth experience
- potential for future growth
- constraints to expanded production
- markets and marketing methods
- amount, quality, and prices of products

This is an extensive list which will not be required in all situations. Analysts should focus their investigations on those elements which are most closely related to proposed interventions. A number of the techniques discussed in Chapter Four, Micro Analysis of Beneficiary Groups, are relevant to the investigation of small and informal sector enterprises.

Labor Markets

The labor market brings together labor supply and demand. In a theoretical free enterprise system, the market should insure that wage rates are consistent with marginal productivity (i.e., wages equal to the productivity of the last worker hired). In practice, labor markets are not perfect. Minimum wage laws may distort labor prices. Individuals normally do not sell their labor to the highest bidder each day. Buyers and sellers of labor do not have perfect information. Employers may refuse to hire additional labor, even at extremely low wages, because the marginal overhead cost of labor may be greater than marginal productivity. Costs of employment to the sellers of labor, such as opportunity costs or journey to work costs, may be higher than their anticipated wage. Despite these influences, labor markets in most third world areas operate relatively well.

Labor market difficulties can be identified by four basis signs:⁸

1. Enforced minimum wage laws which are inconsistent with worker productivity;
2. High rates of open unemployment accompanied by numerous unfilled vacancies;
3. Wide regional wage differentials together with the absence of internal migration in directions suggested by differentials; and
4. Massive social and political discontent focused on present employment situation.

Analysts can look for these signs when evaluating the operation of labor markets.

Projections

Labor Supply.⁹ A projection of labor supply is an estimate of the size and composition of the labor force in future years. Projections normally are made for five to twenty years. The simplest method is the constant growth rate method which assumes that past labor force growth rates will continue into the future. For example, if the size of the labor force increased by thirty percent between the 1970 and 1980 censuses, it is assumed that it will grow by thirty percent between 1980 and 1990. This simple method provides rough projections; sometimes better projections can be made by subdividing the labor force by sex and age categories and assuming a constant growth rate for each category.

More accurate labor force projections can be obtained by making separate estimates of: (1) future population, and (2) future labor force activity or participation rates. Projections of

future population are discussed in Chapter Five, Migration and Urbanization; consequently, there is no need to discuss them here.

The easiest and most commonly used approach to projection of labor force participation rates is the extrapolation method. This technique assumes that the per year increase or decrease in participation rate will continue in future years. For example, if the crude activity rate for all females in an urban area was twenty percent in 1975 and thirty percent in 1980, the average un-compounded increase would be two percent per year. Linear extrapolation indicates that the activity rate will be forty percent in 1985, and fifty percent in 1990. More accurate estimates can be obtained if labor force participation rates are extrapolated separately for each age-sex cohort. The extrapolation approach works fairly well for short term projections; however, long term projections must be used with caution. In the example above, the 1990 projection of fifty percent would be unreasonable if independent calculations reveal that over half of the female population will be under fifteen years of age in 1990. In extreme cases the method may yield rates of greater than one hundred percent or less than zero percent; correction factors have been developed to overcome this problem.

Other extrapolation methods have been developed. The indirect method extrapolates inactivity rates and subtracts these from one hundred percent to obtain activity rates. This technique is recommended for projecting labor force participation rates which are increasing gradually, such as those for women. The cohort extrapolation method is based on the assumption that the labor force participation rate of one age-sex cohort is related to the rates at an earlier period of both the same cohort and the next older cohort. The International Labor Organization (ILO) method is more complicated and involves three separate estimation procedures. Cohort and ILO extrapolation methods, and the more complicated regression and matrix methods, are not recommended for individual urban areas; they are used primarily for making projections of national rates.

Labor Demand. Projections of labor demand are more complicated and difficult than those for labor supply. While labor supply is based on population size, which is relatively easy to estimate, labor demand is based on future economic expansion and productivity levels. It is very difficult to estimate these accurately; consequently national labor demand projections are complicated and subject to considerable error. Demand projections for individual urban centers are even more difficult and tend to be even less accurate.

The simplest method of projecting national labor demand is based on changes in national income. The approach suggested by Harbison, is based on three simple ratios:¹⁰

1. Growth rate of total labor demand is about half the real growth rate of income;

2. The growth rate in demand for very high skilled manpower is roughly double the real growth rate of income; and
3. The growth of demand for middle-level skilled manpower is about three times the growth rate of income.

These ratios are based on relatively old data for national labor demand and national income; they should be used with extreme caution in individual urban areas.

Projections of labor demand for each sector of the national economy can be made using more sophisticated techniques.¹¹ Projections for the manufacturing and construction sectors are based on estimates of future productivity and total sector output. Projections for service sectors involve estimates of future population, per capita income, and changes in the structure of the economy. These detailed, national level, approaches are not suitable for projecting labor demand in individual urban areas. On the other hand, if detailed national level projections have been made, they may provide useful information on the future demand in individual cities.

Accurate projections of labor demand in specific urban areas are very difficult to obtain. Consequently, comparisons of projected labor supply and demand should be interpreted with extreme caution. In many cases, relatively simple projection techniques are used; for example, the constant growth rate or linear extrapolation approaches discussed above. Though simplified approaches do not provide detailed information on the future employment situation, they do suggest the future implications of current employment trends.

SOURCES OF FURTHER INFORMATION*

- * Sinclair, Stuart N. Urbanization and Labor Markets in Developing Countries (London: Croom Helm, 1978, 115 pp.). This book provides a good review of current urban employment literature; Sinclair suggests that the concept of "informal sector" is too crude to describe adequately the wide variety of heterogeneous activities which commonly are ascribed to it.
- * International Labour Office (ILO). The ILO has published a variety of documents relevant to analysis of urban employment. The following are of particular interest:
 - o Bairoch, Paul. Urban Employment in Developing Countries: The Nature of the Problem and Proposals for its Solution (Geneva: ILO, 1973, 99 pp.). A good overview of the urban employment problem is presented including discussions of the extent and characteristics of urban employment, relationships between rural and urban employment, and policy implications.

- o Kannappan, Subbiah. Studies of Urban Labour Market Behavior in Developing Areas (Geneva: ILO, 1977, 234 pp.). The dynamics of labor markets in third world cities are investigated.
- o ILO. Measurement of Underemployment: Concepts and Methods (Geneva: ILO, 1975, 61 pp.). This report provides a good discussion of approaches and methods for measuring underemployment.

* The ILO studies listed below investigate urban labor markets, migration, informal sector enterprises, employment related infrastructure, unemployment problems, and related policy implications.

- o Fapohunda, Olanrewaja J. and Harold Lubell. Lagos: Urban Development and Employment (Geneva: ILO, 1978, 109 pp.).
- o Joshi, H., H. Lubell, and J. Mouly. Urban Development and Employment in Abidjan (Geneva: ILO, 1976).
- o Lubell, Harold. Urban Development and Employment: The Prospects for Calcutta (Geneva: ILO, 1975, 143 pp.).
- o Lubell, Harold and Douglas McCallum. Bogota: Urban Development and Employment (Geneva: ILO, 1978, 145 pp.).
- o Schaefer, K. Urban Development and Employment in Sao Paulo (Geneva: ILO, 1976, 106 pp.).
- o Sethurman, S. V. Urbanization and Employment in Jakarta (Geneva: ILO, 1976).
- o Sethurman, S. V. ed. The Urban Informal Sector in Development Countries (Geneva: ILO, 1981, 221 pp.). A summary of the informal sector studies in nine cities indicates that sector employees generally receive less than legal minimum wage and are about one-third household heads and one-quarter female. Policies for overcoming key constraints and thus absorbing additional labor are discussed.

* United Nations. Manuals on Methods of Estimating Population: Manual V. Methods of Projecting the Economically Active Population. Department of Economic and Social Affairs, Population Studies No. 46 (New York: U. N., 1971, 100 pp.). Manual discusses a variety of methods of projecting labor supply and demand. Methods presented include extrapolation, correlation, matrix representation, labor replacement indices, and working life tables.

- * United Nations. Methods of Analyzing Census Data on Economic Activities of the Population. Department of Economic and Social Affairs, Population Studies No., 43 (New York: U. N., 1968, 130 pp.). Presented are methods of analyzing: dependency ratios, sex-age specific activity rates, regional and urban-rural patterns, and classification of workers by industry, occupation, and status.

World Bank. Recent publications relevant to analysis of urban employment include:

- o Fields, Gary S. "How Segmented Is the Bogota Labor Market," Working Paper No. 434 (1980, 99 pp.). Study reveals that income is very weakly correlated to occupation and industry, mildly correlated with education and age, and strongly correlated with sex.
- o Krishna, Raj. "Rural Unemployment - A Survey of Concepts and Estimates for India," working Paper No. 234 (1976, 67 pp.). Discussed are a variety of measures of unemployment and underemployment including: time rates versus person rates; current status versus usual status; and time, income, willingness, and productivity criteria of unemployment.
- o Mazumdar, Dipak. "Paradigms in the Study of Urban Labor Markets in LDCs: A Reassessment in the Light of an Empirical Survey in Bombay City," Working Paper No. 355 (1979, 49 pp.). Analyzed are variations in urban wages among formal and informal sectors and migrants with differing family obligations.
- o Mazumdar, Dipak. "The Urban Informal Sector," Working Paper No. 211 (1975, 53 pp.). Paper critically reviews such aspects of the urban informal sector as size, employee characteristics, earnings, and temporal changes.
- o Mazumdar, Dipak. The Urban Labor Market and Income Distribution: A Study of Malaysia, Published for the World Bank (New York: Oxford University Press, 1981, 392 pp.). In-depth analysis of employment and household income is presented.
- o Page, John M. Jr. "Small Enterprises in African Development: A Survey," Working Paper No. 363 (1979, 53 pp.). Reviewed are labor intensity, choice of technique, efficiency, capitalization, finance, entrepreneurial training, and policy implications.
- o Shields, Nwanganga. "Women in the Urban Labor Markets of Africa: The Case Study of Tanzania," Working Paper No. 380 (1980, 136 pp.). This case study analysis of

1971 survey data reveals that the differences between male and female employment status primarily result from differences in education.

- o Squire, Lyn. "Labor Force, Employment and Labor Markets in the Course of Economic Development," Working Paper No. 336 (1979, 157 pp.). Paper investigates rapid labor expansion, industrial employment growth, high unemployment, low productivity and wages, labor markets, urban-rural terms of trade, and policy implications.
- o Stern, Joseph J. "The Employment Impact of Industrial Investment: A Preliminary Report," Working Paper No. 255 (1977, 72 pp.). Paper discusses techniques for measuring direct and indirect employment impacts of industrial investment.
- o World Bank. "Employment and Development of Small Enterprises," Sector Policy Paper (1978, 93 pp.). Discussed are approaches to employment generation through assistance to small scale enterprises.

NOTES

1. Sally Findley, Planning for Internal Migration: A Review of Issues and Policies in Developing Countries, Prepared for U.S. Bureau of the Census (Washington, D. C.: USGPO, 1977). Pamela Briggs, "Some Economic Interpretations of Case Studies in Migration in Developing Countries," World Bank Staff Working Paper No. 151 (Washington, D. C.: IBRD). Paul Balroch, Urban Unemployment in Developing Countries: The Nature of the Problem and Proposals for Its Solution (Geneva: International Labour Organization, 1973).
2. International Labour Organization, Employment, Incomes and Equity: A Strategy for Increasing Productive Employment in Kenya (Geneva: ILO, 1972). Some arguments suggest that the "informal sector" concept is misleading because it groups a very wide and diverse set of activities into a single class; see Stuart W. Sinclair, Urbanization and Labour Markets in Developing Countries (London: Croom Helm, 1978).
3. United Nations, International Standard Industrial Classification of All Economic Activities (New York: UN, 1958, Sales No. 58.XVIII.7).
4. International Labour Office, The International Standard Classification of Occupations (Geneva: ILO, 1958).

* Particularly good sources of further information.

5. U.S. Bureau of Labor Statistics, Conducting a Labor Force Survey in Developing Countries, BLS Report No. 263, Prepared for the Agency for International Development (Washington, D.C.: USGPO, 1965). U.S. Employment Service, Techniques for Determining Manpower Skill Needs and Training Requirements, Prepared for Agency for International Development (Washington, D.C.: U.S. Department of Labor, 1963). John Connell and Michael Lipton, Assessing Village Labour Situations in Developing Countries (Delhi: Oxford University Press, 1977).
6. United Nations, Methods of Analyzing Census Data on Economic Activities of Populations, Department of Economic and Social Affairs, Population Studies No. 43 (New York: United Nations, 1968).
7. Joseph J. Stern, "The Employment Impact of Industrial Investment: A Preliminary Report," World Bank Staff Working Paper No. 255 (Washington: IBRD, 1977).
8. Bruce Herrick and Barclay Hudson, Urban Poverty and Economic Development: A Case Study of Costa Rica (New York: St. Martin's Press, 1981) p. 65.
9. United Nations, Manuals on Methods of Estimating Population: Manual V. Methods of Projecting the Economically Active Population, Department of Economic and Social Affairs, Population Studies No. 46 (New York: United Nations, 1971).
10. F. H. Harbison, "The Elements of Human Resource Development Planning and the Integration of Manpower Planning with General Economic Development Programming," In Lectures on the Labour Force and Its Employment (Geneva: International Institute of Labour Studies, 1963).
11. U. N. (See note 9, above).

10

Urban Land Use and Transport

Different types of urban activities are associated with different land usage; for example, family and social activities generally take place in residential neighborhoods while business and manufacturing have their own specialized areas. Land use specialization is made possible by urban transport systems which link together different activities. Transportation is also an important land use itself; rights-of-way, parking space, and terminals occupy from ten percent and thirty percent of urban land. While transport systems are influenced by changing patterns of land use, transport developments, such as new bridges or roads, can have important impacts on land use patterns.

Urban land use and transport often are analyzed together because they are closely interrelated. This chapter presents a variety of techniques for collecting and analyzing land use and transport data. Future land use requirements and patterns can be estimated from information on land use trends and proposed transport improvements. Transport analysis can reveal the capacities of current infrastructure, estimated future traffic patterns, anticipated bottlenecks, and needed new infrastructure. Many past transportation studies have entailed large surveys, sophisticated mathematical modeling, and use of relatively large computers. This high technology, high cost approach has been employed with relatively limited success for transportation studies in a number of large third world cities.¹ Though this approach is discussed, the emphasis in this chapter is on less expensive methods which are consistent with data and resource limitations in third world areas.

RELEVANCE TO DEVELOPMENT INTERVENTIONS

Rational urban planning is an important factor in the successful identification and design of development projects. Land use and transport inventories are fundamental activities in urban planning; they reveal current urban spatial structure as well as recent changes in this structure. Estimates of future urban land requirements are essential to successful urban development activities. Relationships between land use categories and travel

behavior can be used to estimate future travel patterns, to identify needed infrastructure, and to assess alternative transportation interventions.

Development interventions both influence and are influenced by urban land use and transport. Knowledge of urban land use patterns, land prices, and transport systems can be important to decisions concerning the location of development projects. For example, housing projects should be located on suitably priced land with adequate transport to employment opportunities and important social and cultural facilities. The influence of proposed development interventions on existing land use and transport can be identified and assessed with respect to contribution to overall urban development goals. For example, a housing or industrial intervention may increase greatly congestion on an arterial road linking it to the central business district. This additional congestion should be included as a factor in project analysis. An investigation might be undertaken to determine the feasibility of widening the arterial as a component of the project.

TYPICAL QUESTIONS

- o What percentage of urban land is occupied by housing? Commercial activities? Public institutions? Streets and roads? Industries? Vacant areas or recreation? How do these percentages differ from city to city or from area to area within major cities? What is the mapped pattern of land use?
- o What urban land use changes have occurred in the recent past or are expected to occur in the next ten years? How will these changes influence urban transport patterns? What are future urban land requirements for each major city? Is suitable land available for urban expansion?
- o What are the characteristics of the urban land market? What are the spatial patterns of land values and land prices? What are the ownership patterns? What are the social and legal concepts of land ownership and property utilization rights?
- o What current land use controls are practiced? How effective are zoning and land use planning activities? What are the characteristics of urban land taxation systems? Does government attempt to curb land speculation?
- o What are the relationships between urban land and urban transport? Have recent land use changes helped or hindered the urban transport situation? How have land use patterns been influenced by transportation developments?

- o What are the characteristics of transport and congestion? What are journey to work patterns? Where are major bottlenecks? What percentage of urban travel is conducted by foot? By bicycle? By collective taxi? By mini bus? By rail? By private automobile? What is the ownership rate for automobiles? Trucks? Motorcycles and scooters? Bicycles?
- o How are goods transported within urban areas? How much is moved by individual porters? Hand carts? Animal carts? Bicycle carts? Trucks? What are major spatial and temporal movement patterns?
- o What is the spatial pattern, condition, and capacity of such urban transport facilities as urban arterial roads? Highways? Rail lines? Bus, truck, and train terminals? Major intersections? What changes have been made or are planned?
- o What future patterns of urban travel are anticipated? How can future urban transport problems be avoided? What are the transport implications of anticipated changes in urban spatial structure?

DATA SOURCES

Data are very important to analysis of urban land use and transport; several sources are available.

Existing Studies and Surveys

Existing data sources should be utilized fully before new data collection efforts are initiated. Considerable land use and transport data are currently available for many large urban areas in the third world. Survey data have been collected by a variety of organizations including city planning offices, planning ministries, international development agencies, and a wide assortment of consultants.

Land Use Data. Planning agencies often have land use data in the form of land use maps, aerial photography, or cadastral surveys. Information may be available on land use regulations, zoning laws as well as tax rates, assessments, and collections. Interviews with local planning officials may reveal differences between de jure and de facto land use controls. If tax assessments are an unreliable indicator of land prices, more appropriate data might be available from land transfer registers or from local banks and other land finance organizations. Other possible sources of information on land use include national mapping agencies, electricity corporations, public works agencies, planning and engineering departments, and housing ministries and agencies.

Transport Data. Accurate transport data are more difficult to collect than land use data; consequently government agencies are less apt to have these data. Information on existing and proposed streets and roads and their surface conditions usually can be obtained from city planning, public works, or road maintenance agencies. Data on vehicle ownership can be obtained from vehicle registration, licensing, or taxing bureaus or from the census or household sample surveys. Though most motorized vehicles are registered, many bicycles, handcarts and other nonmotorized vehicles are not registered. Data on travel flows are difficult to obtain. Bus schedules and brief surveys of bus and taxi drivers may provide some information on spatial and temporal travel flows. Public works agencies may have data on traffic counts for major urban roads; some origin-destination data may be available.

Land Use Inventories

Land use inventories compiled from surveys or aerial photographs, provide an accurate description of land use patterns. Each inventory must be based on a well defined land use classification system which includes categories such as residential, commercial, industrial, public and institutional, streets and transport facilities, and open or recreational space. These may be subdivided; for example, residential can include low, medium, and high density or public and institutional can be subdivided into educational, government offices, hospitals, military areas, etc.

Field Surveys. Land use surveys usually involve block by block recording of field observations on base maps. At the very minimum, base maps should show streets and individual blocks. More accurate land use inventories use base maps showing individual land parcels within blocks. Sometimes, several land uses occur within a single parcel; this is particularly true in areas with multi-storied buildings. In such situations, each individual land use, by storey, can be recorded.

With the inspection map-record method,² the simplest type of land use survey, field workers inspect each area, determine the land use, and record their findings directly onto base maps. The approach can be combined with interviews when simple inspection of building exteriors does not yield enough information on land use. With the field listing approach, field workers record information directly on preprinted land use forms.³ One line of the form is reserved for each land use within each parcel and each block is recorded on a separate page. The form normally includes information on address, tenure, number of household units, structure type, description of activity, land use code, and building size and condition. Usually short interviews are required at each parcel.

Aerial Photography. In many cases aerial photography is the quickest and most efficient means of conducting a land use inventory. Usually aerial photographs of urban areas can be

acquired from commercial firms or national agencies at moderate cost. With a small amount of experience, a few inexpensive tools, and familiarity with the city, relatively accurate land use information can be obtained from aerial photographs. If for any reason the land use of some parcels is unclear on the aerial photographs, quick field checks can be made. The photographs also can yield information on street and road widths and conditions, physical features and topography, and urban vegetation. Aerial photography is a particularly good approach when no base maps or existing land use information are available. Aerial photographs also have the advantage that they can be updated quickly and relatively inexpensively.

Transport Inventories

Transport inventories contain information on urban paths, streets, and highways as well as movements on these.

Circulation System. The circulation system consists of foot paths, local streets, collector streets, arterials, urban highways, mass transportation lines, and urban waterways. It can be inventoried using either direct field observations or aerial photography. The focus is usually on the existing capacity of important links, which usually are defined as sections of major roads between key intersections. Capacity depends upon road widths, surface conditions, intersections, and traffic obstructions. Capacity often is measured in equivalent passenger car units (p.c.u.); these units relate to the traffic efficiency of alternative travel modes. For example, a pedestrian may count as 0.1 p.c.u., while a bus counts 2.0 p.c.u., and a bulky inefficient bullock cart counts 4.0 p.c.u. An arterial street with a rating of 600 p.c.u. per hour theoretically could handle 6000 pedestrians, or 300 buses, or 150 bullock carts per hour. Unfortunately, key arterials often are utilized by a variety of different competing modes and the mixing of these often reduces the overall capacity. Pedestrians are the dominant form of transport in most urban areas; for example, two-thirds of the trips in Kinshasa and Dar es Salaam are made on foot.⁴

Traffic Patterns.⁵ Data on circulation system utilization can be collected by making traffic counts. Such counts record the number and types of vehicles or pedestrians passing selected observation points during a typical day. Usually observation points are placed on key links in the circulation system. Traffic counts of all vehicles and pedestrians moving into or out of selected zones are called cordon surveys. Traffic counts may be conducted using either manual or mechanical techniques.

Manual traffic counting has a number of advantages. Vehicles types can be classified easily and number of occupants ascertained. Traffic flows in each direction can be recorded accurately. Unusual situations such as accidents, breakdowns or other observations can be observed and recorded. Trained observers can count and classify up to 500 vehicles per hour in one direction

and 100 per hour in both directions. Often preprinted tally forms are used to count vehicles, by type, for separate time periods of an hour or half hour. This enables the collection of data on the temporal pattern of traffic including rush hour peak periods. When counts of small traffic flows are to be made by untrained or illiterate observers, the pebble-and-can method can be used. With this approach, cans are labelled with a drawing or symbol to represent each vehicle type; the observer places a pebble in the appropriate can for each vehicle observed.

Mechanical counting methods can be cheaper and more accurate than manual counting but are also less flexible. Mechanical counting often is used for continuous counts over long periods or for counts in remote areas. However, these conditions rarely occur in urban transport studies.

Unfortunately traffic counts provide information only on number of vehicles; vehicle speed is another important factor in determining total traffic flow. Speeds can be obtained by measuring the time required to move between two places. Two observers can be placed at two markers along a length of road where vehicle speeds are representative. The first observer signals when a vehicle has passed the first marker; the second observer uses a stop watch to determine the time elapsed to reach the second marker. If the two markers are 147 feet apart then the speed in miles per hour is equal to $100/T$ where T is the elapsed time in seconds. Alternatively, if the markers are 55.5 meters apart, the speed in kilometers per hour is equal to $200/T$. Vehicle speed also can be measured mechanically using radar, enoscope, or crystal controlled oscillator.

Pedestrian Movements. Because foot travel is the major mode of transport in most third world cities, pedestrian surveys are very important. Walking is about the most efficient means of urban travel. A twelve foot urban right-of-way can handle 1,100 pedestrians per hour, or 200 persons per hour in four passenger taxis, or 500 persons per hour in thirty passenger buses.⁶ Unfortunately, transportation planners often have overlooked pedestrian travel in urban areas. Accurate pedestrian surveys are more difficult than vehicle surveys because: (1) pedestrian travel is not restricted to a formal circulation system; (2) pedestrian flows can obtain much higher densities; and (3) flows in both directions are intermingled. Pedestrian surveys require manual counting, no suitable mechanical counters are available. On most footways, observers can count pedestrians accurately over short periods of time, such as five minutes. Sufficiently accurate counts can be obtained using several five minute periods per hour. On most crowded footways, two observers may be required to count separately pedestrian movements in each direction. On wide and crowded footways manual counting methods are difficult to use; flows may be derived using speed and density measurements. Speed may be measured by timing individual pedestrians over a known distance. Density can be obtained by taking photographs from above the footway and then counting persons in the photographs.

Origin-Destination (O-D) Surveys. These surveys provide detailed information on place to place travel and trip purpose. O-D surveys may be conducted by stopping and interviewing a sample of traffic or by conducting interviews in sampled households. The second method is preferred because it insures a thorough interview and does not delay individuals or traffic. The survey normally collects information on both household characteristics and the intraurban travel of its members. Data are obtained on trip origin, trip purpose, travel mode, and time of day. O-D surveys also can be made of taxi drivers, delivery wagons, and other commercial traffic. Commercial traffic is a major element of urban transport and therefore should be included in O-D surveys.

O-D surveys can provide information that is useful in transportation planning; however, accurate O-D surveys are difficult to conduct. The selection of an appropriate sample requires technical knowledge of statistics and considerable information of the travel and residential characteristics of the local population. For these reasons, as well as the high cost and time requirements, O-D surveys may be inappropriate in many situations.

ANALYSIS OF DATA

A variety of different analytical methods can be used to analyze urban land use and transport. This section describes urban land use inventories, estimates of future urban land requirements, land markets, transportation planning models, and simple traffic forecasting techniques.

Land Use Inventories

Data from land use inventories can be presented in either land use maps or statistical tables. Land use maps are essential to land use planning and zoning activities. They also can provide insights concerning future urban growth patterns and appropriate locations for development interventions. As cities grow, urban land uses at the periphery tend to expand into formerly rural areas; for example, rural land adjoining low income residential areas probably will become low income housing areas in the future. By the same token, rural areas adjacent to high income areas probably will be developed as high income residential areas. A land use table indicates the number of hectares and percentage of total urban land occupied by each land use. Several methods are available for obtaining land use percentages from land use maps. The dot counting method is one of the simplest. A regular dot grid is laid over the land use map and the number of dots over each land use category are counted. Land use percentages are obtained by dividing the number of dots over each category by the total in all categories. The cut and weigh method is also simple. Each land use category is carefully labeled on the map; scissors are used to cut up the map; and clippings representing each land use category are placed in separate piles. Each pile is weighed carefully on a laboratory balance to determine the percentage in each category.

Planimeters or computer digitizers also may be used to determine land use percentages.

Land use tables can be developed which indicate land use densities, i.e., population per each unit of land use. Population densities can be expressed as persons per hectare of residential land. These densities can be compared for different cities or for different areas within the same city. Densities also can be calculated and compared for other land uses; for example, comparisons can be made of persons per hectare of commercial land or per hectare of land used as streets or roads. Density tables may indicate severe residential overcrowding or zones in need of additional commercial or transport areas. Urban population densities are discussed also in Chapter Five, Migration and Urbanization.

Future Urban Land Requirements

A land use inventory can be used in estimating future land use requirements. Requirements are influenced by existing land use patterns, projected population growth, level of development, natural environment, topography, and changes in transportation. The most common method of estimating future land requirements is based on population forecasts and specified relationships between population and urban land consumption. Methods of forecasting urban population growth are presented in Chapter Five, Migration and Urbanization. The specified relationships can be based on either current land usage densities, or norms or standards of land usage. The easiest technique is to assume that current ratios of population to area in each land use category will remain constant. With this approach, percentage increases in population can be used to estimate future land requirements. For example, if the population of a city is projected to increase by eighty percent in ten years, then land required for each land use category is estimated to increase by eighty percent. Though this technique is simple, it has some disadvantages. First, as cities grow in population size, their land use densities tend to increase; the eighty percent population increase in the example may only result in an increase of thirty percent in urban land. Second, land use distribution tends to change with urban growth; the percentage of land which is residential or vacant tends to decrease while the percentage increases for industrial and transport land uses.

Future land usage densities can be estimated from usage densities of similar, but larger, cities. Such estimates can be adjusted to reflect transportation and economic trends, planned developments, and land availability. This somewhat ad hoc approach is often the best method of estimating future land usage rates. An alternative method is to utilize international land use norms or standards.⁷ Such norms or standards vary considerably from country to country; the standard used in one country may not be suitable or possible in another country.

Planners use estimates of future land requirements and other information to delineate alternative patterns of future land use. Desired future land use patterns can be achieved by utilizing a

variety of land use control measures and policies.⁸ There are a number of positive methods such as public acquisition of land through purchase or expropriation, government purchase of development rights, or provision of infrastructure such as streets and roads, utility systems, schools, health or community centers. In addition tax incentives and public financing of private development can be used to guide future land use. Government also can utilize negative techniques to remove or prevent land use that is inconsistent with public objectives. Examples include slum or squatter removal, zoning and subdivision control, withholding of building permits, value freezing until public acquisition takes place, and taxation. Through a combination of these positive and negative controls, government can influence future land use patterns.

Land Markets

Estimates of future land requirements provide insights concerning current and future demand for land. Current demand for land is based on evaluations of its present value as well as its potential future value. Due to speculation, land prices are often higher than land value. Land prices and land values should not be confused. Land prices are determined by supply and demand. Land values, on the other hand, are more abstract and relate to the current social and economic highest and best use of land.⁹ Information on the pattern of land prices can be useful in identifying appropriate project sites which are reasonably priced. Land values may be important because the opportunity cost of land is a factor in decisions concerning the benefits and costs of alternative development projects. A number of methods have been developed for estimating urban land valuation.¹⁰

Transportation Planning Models

A number of sophisticated urban transportation planning models have been developed to forecast future travel patterns and evaluate alternative transportation plans. The forecasting procedure involves the following five steps:

1. Forecast Future Land Use Patterns. Research indicates that urban travel is linked closely to land use patterns. Future land use patterns are forecasted using information on: current land use patterns, population growth, economic trends, topography, physical features, and land use measures. The future land use distribution generally is forecasted separately for individual urban zones which are normally between one and ten square kilometers in size.
2. Trip Generation. The future number of urban trips originating and terminating in each zone are estimated. An urban trip is defined as movement of an individual from one zone to another. Trips are estimated

separately for each purpose, i.e., journey to work, shopping trips, social trips, etc. The number of trips generated by each zone is based on forecasts of land use distribution and socioeconomic characteristics of each zone. Data from origin-destination studies are used to determine the relationships between land use and trip generation.

3. Trip Destination. The trips originating in each zone are allocated among all possible destination zones. Usually some complicated variation of a gravity model is used to estimate trip allocations. The gravity model is based on the idea that the number of trips between two zones is directly related to the size or attractiveness of the zones and inversely related to the distance between them. The simple gravity model is discussed in greater detail in Chapter Six, Urban and Regional Functions and Interactions.
4. Modal Split. This step estimates the distribution of forecasted trips among each travel mode such as walking, bicycle, motorcycle, private auto, taxi, jeepney, minibus, and bus. Modal split is estimated from data on economic status of trip maker, the time and cost of the trip, and the travel characteristics of each mode.
5. Trip Assignment. The forecasted trips made by each mode then are assigned to various transportation routes. Generally, trips are assigned to routes associated with the shortest travel time. The trip assignment step forecasts how many trips by which modes will be made over the circulation system.

Transportation planning models can be used to evaluate proposed transport interventions. Initially, estimated future trip assignments can be allocated to existing transport routes. The resulting traffic forecasts are compared to existing route capacities and overloaded routes are identified. Such routes will be major bottlenecks if no changes are made in the existing circulation system. Planners then can propose changes to the system which increase its capacity. Changes might include new highways, street widening, resurfacing, or new traffic control mechanisms. The travel times between zones then are estimated for the proposed improvements and used to make new traffic forecasts and trip assignments. The new assignments are compared to the capacity of the proposed system to identify potential bottlenecks. In this way, each set of potential transport improvements are evaluated. By using the model in an iterative fashion, planners eventually can determine which proposed transport intervention most efficiently handles projected future traffic flows.

Though the five step transportation modeling process is conceptually simple, very complicated and sophisticated computer

transportation models have been developed. Such models which may involve millions of calculations, are expensive, require a great amount of data, and have met with only limited success. Consequently, the large model approach is not very appropriate for most third world cities. On the other hand, the models which already have been developed can provide some useful insights and data for current transportation planning activities. Recent efforts have been made to develop simple models based on these five steps which do not require computers or large amounts of data.¹¹

Simple Traffic Forecasting Techniques

Traffic forecasting is a very difficult task. Even the very costly and sophisticated models described in the previous section are not capable of making precise forecasts of future traffic flows. There are too many factors which cannot be taken into consideration adequately. Despite these problems, forecasts must be made because they are essential to transportation planning. Fortunately, some relatively simple methods of traffic forecasting are available.

Adequate short term forecasts often can be made by projecting past trends. Forecasts of traffic levels a few years hence can be made by assuming that past rates of traffic increase will continue into the near future. Such estimates for whole cities or regions are likely to be more reliable than those for small areas or individual roads because local growth rates are subject to greater fluctuation.

Simple projections of past trends may underestimate future traffic flows because most of the major factors contributing to traffic generally increase with urban growth. Major factors include population growth, rates of vehicle ownership, average length of urban trip, per capita bus ridership, and trips per length of urban roadway. When these factors are combined they result in an accelerating rate of traffic increase. Because of these various factors, analysts should adjust upwards traffic forecasts based on simple projections of past trends. Adjustments can be based on population projections, estimated future vehicle ownership rates, fuel consumption rates, and information on future economic growth. Adjusted traffic forecasts can be made initially for complete urban areas. Such macro forecasts then can provide a basis for making estimates of future traffic flows for local urban subareas and individual roads. Local forecasts can be guided by estimates of future land use patterns and spatial trends of urban development.

Traffic forecasting involves considerable intuitive judgement and experience; analysts should use whatever relevant information and techniques are available. Traffic forecasts are the basis of identifying and designing transport interventions. Consequently, they must be made even though their accuracy may be suspect. Analysts also must remember that future transport interventions will have strong influences on future traffic levels and patterns.

SOURCES OF FURTHER INFORMATION*

- * Mohan, Rakesh. Urban Economic and Planning Models: Assessing the Potential for Cities in Developing Countries, Published for the World Bank (Baltimore: Johns Hopkins University Press, 1979, 192 pp.). Book provides excellent background for anyone contemplating land use and transport modeling efforts.
 - * United Nations. Manual of Traffic Surveys, Economic Commission for Asia and the Far East, E/CN.11/957 (New York: U.N., 1971, Sales No. E.71.11.F.13, 129 pp.). This excellent manual provides a concise, yet comprehensive description of urban transportation data collection and analysis techniques specifically intended for use in developing areas.
 - * United Nations. Urban Land Policies and Land Use Control Mechanisms, ST/ECA/167 (New York: U.N., 1973); Vol. I. Africa (Sales No. E.73.IV.6); Vol. IV. Latin America (Sales No. E.73.IV.8); Vol. V. Middle East (Sales No. E.73.IV.9); Vol. VII. Global Review (Sales No. E.73.IV.11). This comprehensive study reviews, for each region, factors influencing urban land supply and demand, patterns of urban form and structure, systems of land ownership and tenure, urban policy systems, land control measures, and the key role of planning in controlling land development. The study provides good background information for urban land analysis in individual cities.
 - * World Bank. "Urban Transport Sector Policy Paper," (Washington: IBRD, 1975, 103 pp. Also available in French, Spanish, and Arabic). Provided is an excellent discussion of urban transportation issues including current conditions, relationships between transport and urban spatial form, costs and efficiencies of various transport modes (walking, bicycles, cars, taxis, minibuses, buses, rail systems, expressways, etc.), as well as urban transport prospects and policy alternatives.
- Ayeni, Bola. Concepts and Techniques in Urban Analysis (New York: St. Martin's Press, 1979, 372 pp.). After reviewing a variety of general methods for urban analysis, this book provides a detailed discussion of complex simulation techniques for urban land use and transport modeling.
- Dickey, John et al. Metropolitan Transportation Planning (New York: McGraw-Hill, 1975, 562 pp. Also available in Spanish). Though focused on urban transport in the United States, this text provides considerable discussion relevant to developing areas on travel surveys, origin-destination studies, transportation modeling, land use inventories, and other aspects of transportation planning.

Dunkerley, H. B. et al. "Urban Land Policy Issues and Opportunities," Vols. I and II, World Bank Staff Working Paper No. 283 (Washington: IBRD, 1978, Vol. I, 207 pp.; Vol. II, 152 pp.). This collection of papers focuses on such land issues as land tenure and acquisition, land valuation, land use controls, taxes, and financing of project land costs.

Owen, Wilfred. Automobiles and Cities: Strategies for Developing Countries (Paris: O.E.C.D., 1973). A good discussion of urban transportation issues is provided. The author takes a critical view of private automobiles and recommends increased utilization of taxis, jitneys, and buses. Considerable statistical data are provided.

Rivkin, Malcolm D. Land Use and the Intermediate-Size City in Developing Countries: With Case Studies of Turkey, Brazil and Malaysia (New York: Praeger, 1976, 136 pp.). Discussed are land use information methods, planning and land use control frameworks, and specific control techniques. The three case studies are analyzed indepth.

United Nations. "Land for Human Settlements," Department of Economic and Social Affairs (New York: U.N., 1977, Sales No. E.77.IV.2, 123 pp.). Land policies and land use control measures are reviewed. Topics discussed include: land markets, expropriation and compensation, land use planning, land taxes, and land use controls.

Zahavi, Yacov. "Travel Characteristics in Cities of Developing and Developed Countries," World Bank Staff Working Paper No. 230 (Washington: IBRD 1976, 95 pp.). Study presents a great deal of data on rates of automobile ownership, road densities, time and money travel budgets, and other travel characteristics. Paper concludes that there is a basic similarity between travel characteristics in developing and developed countries.

Walters, A. A. "Costs and Scale of Bus Services," World Bank Staff Working Paper No. 325 (Washington: IBRD, 1979, 49 pp.). This good example of urban transport analysis concludes that privately owned mini buses are more efficient than "integrated" systems based on large buses. Also see Feitel, Charles and A. A. Walters. "Ownership and Efficiency in Urban Buses," World Bank Staff Working Paper No. 371 (Washington: IBRD, 1980, 19 pp.).

* Particularly useful sources of further information.

NOTES

1. Desmond McNeill, "Urban Transport Planning in Developing Countries," Development Planning Unit Working Paper No. 1 (London: Bartlett School of Architecture and Planning, University College, n.d.) mimeo. Rakesh Mohan, "Toward Modeling Poor Cities: A Review of Urban Economic and Planning Models," World Bank Staff Working Paper No. 232 (Washington: IBRD, 1976). P. Viola, "Large Scale Studies in Asian Cities" (London: Centre for Environmental Studies, 1976) mimeo.
2. John Dickey et al., Metropolitan Transportation Planning (New York: McGraw-Hill, 1975).
3. Ibid.
4. World Bank, "Urban Transport Sector Policy Paper." (Washington: IBRD, 1975), p. 19.
5. Techniques discussed here are adapted from United Nations, Manual on Traffic Surveys, Economic Commission for Asia and the Far East, E/CN.11/957 (New York: U.N., 1971, Sales No. E.71.11.F.13).
6. World Bank, p. 74 (See note 4).
7. United Nations, Human Settlements Performance Standards (New York: U.N., 1977).
8. United Nations, Urban Land Policies and Land-Use Control Measures: Volume VII, Global Review, ST/ECA/167/Add.6 (New York: United Nations, 1975, Sales No. E.73.IV.11). Malcolm Rivkin, Land Use and the Intermediate-Size City in Developing Countries (New York: Praeger, 1976).
9. U.N., Urban Land Policies (See note 8).
10. Harold B. Dunkerly et al., "Urban Land Policy Issues and Opportunities," Vol. I, World Bank Staff Working Paper No. 283 (Washington: IBRD, 1978).
11. U.N., Manual. (See note 5). Transportation Research Board, "Travel Estimation Procedures for Quick Response to Urban Policy Issues," National Cooperative Highway Research Program Report No. 186 (Washington, 1978). Comis Corp., "Quick Response Urban Travel Estimation Manual Techniques and Transferable Parameters: A Users Guide," Prepared for Transportation Research Board (Washington, 1977).

11

Housing Analysis

Housing is recognized widely as one of the most serious problems confronting urban areas of the third world. The seriousness of the problem is suggested by data on urban slums, squatter settlements, and substandard housing. However, these data should be interpreted cautiously because such terms as slum, squatter settlement, and substandard housing are subject to qualitative evaluation. Different and widely varying criteria are used to distinguish between acceptable and unacceptable housing conditions. Data on percentage of families living in slums and squatter settlements tend to overestimate the housing problem because many families living in such conditions perceive their housing to be quite acceptable. Still, the data provide a dramatic indication of the housing problem throughout the third world. The percentage of urban population living in slums and squatter settlements is alarming: over ninety percent in Yaounde and Addis Ababa; over sixty percent in Dogota, Accra, Kinshasa, Casablanca, and Ankara; and over thirty percent in Mexico City, Lima, Rio de Janeiro, Nairobi, Delhi, Calcutta, Manila, and Seoul.¹

There are a number of factors which contribute to the ever growing housing problem. The problem is exacerbated by urban population growth rates of five percent to ten percent per year. In the face of such rapid population growth, it is difficult to maintain existing levels of housing let alone improve upon these levels.

Another key factor is the low incomes of the urban poor and their inability to afford adequate housing. Low income is a primary cause for the establishment and continued existence of squatter settlements. The urban poor cannot afford to rent or buy conventional housing; consequently, they construct housing on vacant land and attempt to obtain needed services through whatever practical means are available. The challenge to public and private housing institutions is to provide acceptable housing which the urban poor can afford.

An often overlooked factor of the urban housing problem is location. Low cost housing developments frequently are distant from employment opportunities and other important activity areas of

the urban poor. This is particularly unfortunate in very large cities where transportation between place of residence and work can absorb a large percentage of poverty group income. On occasion, workers have been forced to sleep in the streets during the week because they cannot afford the cost of daily commuting. In such situations, workers can see their families in periphery housing areas only on a weekly basis.

Adequate housing is important for a variety of reasons. Housing provides the physical framework in which social, cultural, and economic activities take place. Adequate housing and sanitary facilities directly contribute to improved health and productivity. The construction of new or improved housing makes an important economic contribution to employment, production, and savings. Housing developments also have important consequences for city planning and orderly urban development.

In this chapter a number of different techniques are presented for analyzing housing situations in third world areas. Methods are described for assessing housing conditions, housing requirements and needs, the economics of proposed housing solutions, housing policy, and other elements of the shelter delivery system.

RELEVANCE TO DEVELOPMENT INTERVENTIONS

Housing is a principal development objective in almost all third world cities and all countries have plans and programs to improve urban housing conditions. Such housing interventions should be based upon careful analysis of the housing situation. Data can be collected and analyzed on housing age, size, tenure, construction type, service availability, density, and crowding. Current and future housing requirements and needs can be ascertained. Studies are made of the shelter delivery system which includes government housing policy, housing codes, formal and informal financial institutions, housing technology, level of construction activity, availability of land for housing, and residential services such as potable water, wastes disposal, electricity, and transportation. Programs can be designed to improve future housing conditions. Economic analysis provides a rational basis for determining the minimum income needed to afford various types of housing solutions. By combining economic analysis with information on local housing preferences and priorities, interventions can be developed which provide low income groups with appropriate housing solutions at a price they can afford.

In addition to improved living space and shelter, successful housing interventions can supply considerable employment, improved environmental health, and access to education, health and other social services. Previous empirical analysis suggest that the employment multiplier for housing investment is about two.² Data from Korea, Pakistan, India, Mexico, and Colombia suggest that for every \$10,000 invested in housing, seven direct jobs are generated as well as fourteen indirect jobs generated through multiplier effects.³ Environmental health, in the form of access to potable

water and appropriate waste disposal, is a benefit which contributes both to improved quality of life and to increased labor productivity because healthy workers are more productive workers. Improved labor productivity can mean increased individual incomes, additional jobs through multiplier effects, and growth in the national economy. If housing projects are located well, they can provide improved access to schools, health clinics, employment, cultural facilities, and other activities essential to quality of life.

TYPICAL QUESTIONS

- o Which residential areas within cities have the best or worst housing conditions? How much do housing conditions vary within neighborhoods? Is access to water, sewerage, electricity, and transport equally distributed within urban areas?
- o How do tenure patterns vary between and within urban areas? What percentage of housing units are owner-occupied? Rented? Owned on public land? Owned on someone else's private land?
- o Where are major slums or squatter settlements? What are the characteristics of these areas? What proportion of the population of each city live in slums or squatter settlements? Do government policies and actions encourage or discourage squatter settlements? Do programs exist which enable squatters to obtain ownership of land?
- o What public and private institutions and organizations are involved in the housing delivery system? How much coordination and communication is there? What proportion of total housing is provided by the public sector? Are public housing projects accessible to employment opportunities? Essential services? Low cost transport? What percentage of the population can afford the least cost public housing?
- o What are current legal building codes and standards? Are these enforced? Do they act as a constraint to the provision of low cost housing? Are efforts being made to reform existing codes and standards?
- o What types of housing materials and building techniques are used by formal and informal construction sectors? What are skill levels and wages rates? Are costs of key building materials expected to increase in the near future? Are substitute materials available?

- o What sources of formal and informal housing finance are available? What are loan conditions and interest rates? What finance sources are available to low income groups?
- o What are the key constraints to expanded housing construction? Land? Labor? Building standards? Materials? Financing? Water? How can key constraints be overcome?
- o What is the current housing deficit? How many additional housing units will be needed in the next ten years? How many will be constructed in the next ten years if current trends continue? What will the housing deficit be in ten years?
- o For each income decile, what proportion of income currently is spent on housing? Are families willing to spend more? What are the current costs of representative housing solutions? What are the respective costs of land? Materials? Labor? Key service connections? Taxes? Maintenance?
- o What housing design features are crucial or unimportant to different socioeconomic or ethnic groups? What are the most important housing priorities and preferences of low income urban families? What monthly housing payments are different income groups willing to pay for different housing solutions?

DATA SOURCES

Housing Censuses

Censuses are the most comprehensive and readily available source of housing information. Census data normally provide a variety of housing indicators for every small spatial subarea (neighborhood or community) in the country. The following list of "basic" housing indicators is recommended by the U.N. for inclusion in housing censuses.⁴

- Classification of building by type
- Construction material of outer walls
- Year or period of construction
- Specific location
- Type of structure
- Type of living quarters
- Permanence
- Marginal or improved housing
- Ownership
- Tenure

Rental amount
 Number of rooms
 Source of water supply
 Toilet, bathing, and cooking facilities
 Type of lighting
 Number, age, sex, occupation, and activity of occupants

Though many housing censuses do not include all of these indicators, some include all of these and more.

Though censuses provide a wealth of data on housing conditions, they have some drawbacks. Censuses usually are conducted every ten years; therefore, information from the most recent census may be outdated. This is a particularly serious problem for new and rapidly growing areas within large cities. The problem is exacerbated by the fact that it can take years to obtain initial results; for example, results from the 1980 census in some countries may not be available until 1985 or 1986. In addition, census data are somewhat limited in scope. Though they provide excellent information on housing conditions, they provide almost no data on other aspects of housing such as housing policy, financial institutions, building technology, construction trends, etc.

Public Data Sources

A variety of housing data are available from public and semi-public sources and agencies. Housing policy is reflected in government plans, legislation, building regulations, and tax laws. A wide range of housing information can be obtained from the reports of government agencies and interviews with their personnel. Relevant agencies include: ministries or departments of housing, public works, economic planning, water and sewerage, public health, and commerce as well as those involved with building permits, and inspections, mortgages and home finance, tax assessments and collections, and urban planning. A sizeable portion of the shelter delivery system is in the informal sector; this is particularly true of activities which supply housing to low income groups. Interviews and surveys often are required to obtain accurate information on informal sector activities.

Surveys

Household and enterprise surveys can be an important source of information on housing conditions and the shelter delivery system. Whenever possible, existing survey data should be used; often government agencies conduct intercensal sample surveys of housing conditions. New sample surveys are expensive and time consuming; therefore, they should be undertaken only when absolutely necessary. The utilization of aerial photography, a quick and efficient housing survey technique, should not be overlooked. Additional information on survey techniques is provided in Chapter Four, Micro Analysis of Beneficiary Groups.

ANALYSIS OF DATA

There are a number of different analytical techniques which can be used to investigate housing conditions, policy, shelter delivery system, housing requirements and needs, housing economics, and target group priorities and preferences.

Inventories of Housing Conditions

One of the easiest and best ways to investigate and describe the urban housing situation is to undertake an inventory. Housing conditions in different cities can be compared by developing tables which provide, for each city, such housing indicators as proportion of population in slums, squatter settlements, or substandard housing; age of housing; persons per room; population density; percentage with electricity, inside plumbing, or dirt floors; persons or families per water tap; or tenure and occupancy status. Similar tables can be constructed to compare neighborhoods within individual cities or housing conditions in different areas at different points in time.

In developing an inventory, attempts should be made to account for all households. The fact that sixty percent of the houses are served by a sewer system is interesting, but says nothing about where the other forty percent dispose of their human and water wastes. Information on those who do not benefit from existing service systems should be included in inventories because these people are often the intended beneficiaries of housing interventions.

Analysts can construct contingency tables and undertake correlation analysis to investigate important relationships. Characteristics of occupants can be compared to housing indicators. For example, household size, ethnicity, migration status, or the age, sex, education, or occupation of the household head can be compared to any one of the aforementioned housing indicators. Relationships may vary from city to city; therefore, it is often a good idea to investigate important relationships separately within each city or within those cities where housing interventions are contemplated. Contingency tables and correlation analysis are described more fully in Chapter Four, Micro Analysis of Beneficiary Groups.

Housing stress maps can be produced easily by developing and mapping key housing indicators.⁵ Indicators may be weighted and combined to produce a single index of housing quality. Such an index might include the aforementioned indicators as well as measures of accessibility to employment, markets, schools, transport, as well as social, cultural, and recreation facilities. The weighting of indicators usually is based on judgements; for example, persons per room might have a weight of ten while access to amenities might be weighted only two. The completed housing stress map provides a graphic description of housing quality in different areas within a city. The construction of housing stress maps is similar to the techniques of poverty mapping discussed in Chapter Two, Spatial Distribution of Development and Poverty.

Housing Policy

Analysis of housing policy seeks to identify and describe relationships between government activities and housing. This analysis is very similar to that described in Chapter One, Analysis of Urban and Regional Policy; therefore, readers primarily interested in housing policy analysis are referred to that chapter. Housing policy is defined very broadly as any government activity which influences housing. It includes explicit housing policy as well as the implicit, and sometimes unintended, impact of government decisions on housing. Analysis of explicit housing policy is relatively easy; it requires a careful reading and analysis of housing policy documents. Such documents can be scrutinized to identify both their intended and possible unintended impacts on housing. The activities of government housing and related agencies can be investigated to determine their consistency with stated housing policy. Such consistency checks lead to the analysis of implicit housing policy.

Analysis of implicit housing policy often begins with a listing of all government activities or programs which influence housing. The list might include:

- Building codes and standards
- Public housing programs
- Service provision activities
- Wage and price controls in building industries
- Subsidies to suppliers of construction materials
- Activities of government banking and financial institutions
- Land and other taxes
- Rent subsidies and controls
- Government reaction to squatter settlements

For each item on the list an assessment can be made of the influence on housing. The assessment may indicate whether the activity promotes or restricts the normal provision of housing. The impact of government activities on different income groups can be investigated. For example, the minimum income needed for public housing can be determined; those with incomes below this amount cannot benefit from existing public housing. It is also interesting to investigate the actual incomes of those living in public housing; often these families have relatively high incomes and gain substantial savings by living in subsidized public housing. There are no hard and fast rules for the analysis of implicit housing policy. The analysis requires careful collection and organization of information on government activities as well as a degree of experience, intuitive judgement, and common sense.

Shelter Delivery System

The shelter delivery system overlaps with housing policy because government is involved in many aspects of shelter delivery

such as finance, service delivery, and land ownership and control. Analysis of the shelter delivery system involves investigations of land, services and infrastructure, building supplies and technology, construction labor and management, and housing finance. The analysis is particularly important because most housing interventions seek to improve the shelter delivery system.

Land. Current land use patterns and legal concepts pertaining to land ownership are important to housing interventions. Particular attention often is focused on the ownership of vacant or semi-vacant urban land with housing development potential. Legal land ownership concepts may restrict or eliminate land transfers and therefore prevent housing development. For example, lands held in tribal ownership are not easy to transfer or convert to urban housing. In some areas important distinctions are made between land ownership per se and rights of property utilization. Public versus private ownership and land use rights usually vary from country to country. Analysis can identify these various aspects of land ownership and determine their implications for housing interventions.

Maps of Housing Potential. Maps which summarize the suitability of land for housing development generally focus on unused land or land whose use can be changed or intensified.⁶ Appropriate indicators of housing potential include present land ownership patterns, land prices and values, accessibility to existing services, and cost of extending existing services or providing new services. Indicators can be weighted and combined to form an index of housing potential. Mapping provides a graphic description of areas within a city which are most suitable for new housing interventions. Instead of developing a weighted index, it is sometimes more convenient to convert all indices of housing potential to money values on a per unit basis. With this approach, the map indicates the per unit costs of housing interventions in different areas of the city. Other methods of urban land analysis relevant to urban housing are discussed in Chapter Ten, Urban Land Use and Transportation.

Housing Service and Infrastructure. Analysis of housing services and infrastructure is very similar to analysis of general service delivery systems which is discussed in Chapter Eight, Urban Administration and Delivery of Public Services. The only difference is that housing analysis focuses specifically on housing related services such as potable water, wastes disposal, electricity, and transport.

Housing Construction. Analysis of building technology, materials, labor, and management is important to obtaining an adequate understanding of housing. The analysis, which can include both formal and informal housing industries, provides information on the actual inputs needed to construct different types of dwelling

units. Levels and trends of construction activity can be described using such indicators as new dwelling units completed per 1,000 population per year and percentage contribution of construction industry to gross domestic product. For each price range, information can be collected and analyzed on design characteristics such as number of rooms and space provided for food preparation, hygiene, sleeping, etc. Such design characteristics of new units often are assumed to reflect popular demand.

Building techniques and materials, as well as labor requirements and skill levels can be described using information from building contractors. It is useful to know the amounts, types, and costs of materials needed to construct different types of units. The sources of building materials can be identified and assessed with respect to current and future output levels, material quality and standards, availability, and potential new sources of needed materials. If materials are imported, efforts can be made to identify potential domestic sources. The amount and cost of suitably skilled labor can be assessed; estimates can be made of future construction manpower requirements. Cost comparisons can be made of various housing inputs such as labor, materials, land, financing, and services.

Housing Finance. Analysis of housing finance investigates formal and informal sources of housing credit such as:

- commercial banks
- savings and loan associations
- credit unions
- mutual funds
- savings banks
- social security benefits
- insurance companies
- unemployment compensation funds
- public housing authorities
- family or relatives
- neighborhood lenders
- loan sharks

Each public and private housing finance organization can be analyzed with respect to:

- origin and recent history
- sources and amounts of funds available
- number and sizes of loans made
- eligibility requirements (income level, steady employment, collateral, etc.)
- terms of credit (downpayment required, minimum loan amount, interest rates, length of payback period, method of payment)
- income distribution of those receiving loans
- existing or proposed housing subsidy programs⁷

While this type of information may be readily available for formal sector financial organizations, it is also important to obtain information on informal sector lenders because they are the most common source of financing for low income groups.

Constraints. An analysis of the shelter sector delivery system normally identifies and discusses key constraints. The analysis of constraints can lead to the identification of potential housing interventions. For example, the analysis may reveal that lack of financing for low income groups is a key constraint. This might suggest that a program is needed which either opens a low income home finance window in an existing institution or establishes a new agency to provide such financing.

Housing Requirements and Needs

Housing interventions address the deficit between the number of acceptable housing units required and the number actually available. Housing requirement is the total number of acceptable units needed to house the population. Housing need is a measure of the difference between the actual number of acceptable housing units available and the housing requirement. Housing need should not be confused with housing demand which is the desire for housing supported by the economic ability to satisfy the desire.⁸

Housing requirements normally are estimated as the number of households because it is assumed that each household requires an acceptable dwelling unit. Housing need is measured as the difference between the number of households and the number of acceptable units in the housing stock. Obviously measures of housing need are very dependent upon the definition of an "acceptable" dwelling unit. The definition utilized should be consistent with local conditions and data availability. The number of acceptable housing units may be available directly from census data. Housing need sometimes is assumed to be equal to the number of unacceptable dwelling units; however this practice underestimates need because some families may be completely without a dwelling while others may be sharing a housing unit.

Estimates can be made of future housing requirements and needs in the next five, ten, or twenty years. The level of accuracy of such estimates depends upon data availability and the amount of resources available for the analysis. Future housing requirements are estimated by projecting future increases in the number of households. Such projection methods are presented in Chapter Five, Migration and Urbanization. Future housing need refers to the number of new acceptable dwelling units which must be provided to meet future housing requirements.

Besides increases in the number of households, other factors influence future housing needs. For example, housing is needed to replace current units which are unacceptable. Upgrading and repair of currently unacceptable dwelling units can reduce the number of new units which need to be constructed to meet future requirements. Another factor is replacement of currently

acceptable units which will be lost from the inventory during the period covered by the estimates. Normal replacement of housing units which become dilapidated beyond repair can be estimated from average life span of housing units. Housing life span depends on local building practices and materials as well as on environmental factors. Often a fifty year dwelling unit life is assumed. To these losses must be added units that will be demolished for urban redevelopment projects or by disasters. The conversion of housing units to non-residential uses should be considered also.

The United Nations has developed a simple equation which can be used to estimate future housing needs.⁹ The equation expresses housing needs as:

$$E(t) = H - U + H(t) + rU(t).$$

$E(t)$ = Number of new or repaired units needed in the next t years.

H = The number of households at the beginning of the period covered by the estimate.

U = The number of acceptable living quarters in the inventory at the beginning of the period covered by the estimate.

$H(t)$ = The projected increase in the number of households during the period covered by the estimate.

r = Percentage rate at which acceptable living quarters will need to be replaced during the period covered by the estimate.

Analyses of future housing needs should be tailored to meet local conditions because the same factors are not equally important in all urban areas. For example, replacement of units lost in disasters may be unimportant in some areas and crucial in others. A brief example of housing need analysis is presented in Chapter Thirteen, Costa Rica Case Study.

Housing Economics

Analysis of housing economics is used to determine what types of housing solutions can be afforded by families in different income categories. The analysis compares, for each category, the amount of money available for housing with the amortized cost of various housing units.

The amount of money available for housing for each income category can be estimated from data on income distribution and percentage available for housing. Data and analysis of income distribution are presented in Chapter Two: Spatial Distribution of Development and Poverty. Information on percentage available for housing can be obtained from survey data or estimated. Such

estimates often are based on the empirical regularity that income percentage available for housing is inversely correlated with income level. For example, those in the fiftieth income percentile may spend thirty percent of their income on housing while those in the thirtieth percentile spend fifteen percent and those in the tenth percentile spend only five percent of their income on housing. Because those at the lower end of the income scale can only spare a very small percentage of their meager income for housing, it is often difficult to identify housing solutions which they can afford. In some areas, families in the lowest twenty percent cannot afford even unsewered building sites; such families need subsidies to acquire acceptable housing. By multiplying monthly income by percentage available for housing, the average monthly housing payment can be determined for each income category.

Monthly housing payment figures can be used to estimate the maximum present cost of housing solutions which can be afforded by each income category. By making reasonable assumptions of repayment period and interest rate, mortgage tables can be used to estimate maximum loan amounts. Estimated loan amounts can be increased slightly by assuming a reasonable down payment. The final figure indicates the maximum cost of a housing unit which can be afforded by each income category. An example of this type of calculation is presented in Chapter Thirteen, Costa Rica Case Study.

The second component of housing economic analysis is estimation of the costs of various housing solutions. All housing related costs should be included such as land costs, taxes, water and waste disposal, transportation, electricity, construction costs, etc. It is useful to start with the absolute minimum solution and gradually upgrade the solutions while continually comparing associated costs with the maximum amounts available for housing for each income group. The objective of this exercise is to determine the types of housing solutions which can be afforded by each income group. The analysis may reveal that those in the fifteenth to twenty-fifth income percentile can afford only building sites with communal water taps and latrines while those in the twenty-fifth to fortieth percentile can afford similar sites with core houses. The results of housing cost analysis are essential background information for the design of housing interventions for different income groups.

Housing Priorities and Preferences

Information on the priorities and preferences of intended beneficiaries is essential to successful housing interventions. Too often this element is overlooked and public housing units are provided which are not suitable for the people who are supposed to live in them. To avoid such problems, target group briefs can be developed which reflect the housing priorities and preferences of each beneficiary group.¹⁰ In developing these briefs it may be necessary to subdivide certain groups which have dissimilar housing priorities and preferences. Though some existing data may be available, normally surveys will be required. Survey information

can be collected on household characteristics, existing housing conditions, and priorities concerning dwelling site, interior design, essential on-site services, location, access to public services, available financial and manpower resources for home construction, and perceived housing constraints and problems. By grouping survey responses and comparing housing preferences and priorities with household characteristics, different housing demand groups can be identified. Appropriate housing solutions then can be designed to meet the needs of each demand group. Such groups can be included in the design and implementation of housing interventions. Analysis of beneficiary groups, their priorities and preferences, and their participation in development interventions is discussed more thoroughly in Chapter Four, Micro Analysis of Beneficiary Groups.

SOURCES OF FURTHER INFORMATION*

* Grimes, Orville, F., Jr. Housing for Low-Income Urban Families: Economics and Policy in the Developing World, Published for the World Bank (Baltimore: Johns Hopkins University Press, 1976, 176 pp.). This book is a good source of background information for housing analysis, especially with respect to market factors and policy options. A comprehensive 46 page statistical appendix is provided.

* Payne, Geoffrey K. Urban Housing in the Third World (London: Leonard Hill; Boston: Routledge & Kegan Paul, 1977, 242 pp.). Presented is an excellent, up-to-date review of low income urban housing in the third world. Included is a 100 page case study analysis of housing in Delhi. Implications for improved housing policy are discussed also.

* Wakely, Patrick I., Hartmut Schmetzer; and Bakar X. Mumtaz. Urban Housing Strategies: Education and Realization (London: Pitman, 1976, 113 pp.). This excellent book provides a detailed framework for analyzing third world urban housing and for identifying and designing housing interventions. Tools and techniques are presented for: analyzing housing in different residential areas, estimating housing need, housing economic analysis, identifying target group housing priorities, and planning and evaluating housing strategies. Numerous analytical examples are provided.

The Department of Economic and Social Affairs of the United Nations has published numerous documents on housing in third world areas. Documents relevant to housing analysis are listed below.

o "An Economic Framework for Investment Planning in Housing and Urban Infrastructure" (New York: U.N., 1973, 38 pp., Sales No. E.73.IV.14).

- o "Housing Policy Guidelines for Developing Countries," ST/ESA/50 (New York: U.N., 1976, 124 pp., Sales No. E.76.IV.11).
- o "Housing Requirements and Demand: Current Methods of Assessment and Problems of Estimation," ST/ECE/HBP/46 (New York: U.N., 1973, 87 pp., Sales No. E.73.II.E.3).
- * o "Methods for Estimating Housing Needs," ST/STAT/SER.F/12 (New York: U.N., 1978, 120 pp., Sales No. E.78.IV.12).
- o "Self Help Practices in Housing: Selected Case Studies," (Colombia, El Salvador, Ethiopia, Senegal, and Sudan) ST/ECA/183 (New York: U.N., 1973, 129 pp., Sales No. E.73.IV.15).
- o "The Social Impact of Housing: Goals, Standards, Social Indicators and Popular Participation," ESA/OTC/SEM/77/2 (New York: U.N., 1977, 93 pp., Sales No. E.IV.5).
- o Social Programming of Housing in Urban Areas," ST/SDA/105 (New York: U.N., 1971, 65 pp., Sales No. E.71.IV.10).
- * o "World Housing Survey 1974: An Overview of the State of Housing, Building and Planning Within Human Settlements," ST/ESA/30 (New York: U.N., 1976, 192 pp., Sales No. E.75.IV.8).

Abrams, Charles. Man's Struggle for Shelter in an Urbanizing World (Cambridge, Massachusetts: M.I.T. Press, 1964, 307 pp.). Though dated, this is a classic review of urban housing conditions and policies in third world areas.

Burns, Leland S. and Leon Grebler. The Housing of Nations: An Analysis and Policy in a Comparative Framework (London: MacMillan, 1977, 255 pp.). This book analyzes determinants, costs, benefits, and policies related to housing investment.

Drakakis-Smith, David. Urbanization, Housing and the Development Process (New York: St. Martin's Press, 1980, 235 pp.). Book examines provision of low cost housing for the urban poor and suggests improvements.

Dwyer, D. J. People and Housing in Third World Cities: Perspectives on the Problem of Spontaneous Settlements (London: Longman, 1975, 282 pp.). Book discusses the dynamics of spontaneous settlements and reviews low income, high rise, and self help housing solutions.

Herbert, John. Urban Action in the Third World: Guidelines for the Formulation of Projects (New York: Praeger, 1979). An excellent chapter on housing development interventions is included.

Riaz, Hassan. Families in Flats: A Study of Low Income, Families in Public Housing (Singapore: Singapore University Press, 1977, 240 pp.). This interesting Singapore case study analyzes the social impacts of high rise, ethnically integrated public housing.

Strassman, Paul W. The Transformation of Urban Shelter: Upgrading the Housing Stock in Cartagena, Colombia, Published for the World Bank (Baltimore: Johns Hopkins University Press, 1982, 224 pp.). This indepth analysis supports the view that it is more efficient, practical, and equitable to upgrade existing housing rather than replace it.

Stren, Richard E. Housing the Urban Poor in Africa: Policy, Politics, and Bureaucracy in Mombasa (Berkeley: University of California Press, 1978, 299 pp.). Book provides a comprehensive analysis of regulatory and developmental housing policy in Kenya's second largest city.

Van Huyck, Alfred. "Planning for Sites and Services Programs," Prepared for U.S. Agency for International Development and U.S. Department of Housing and Urban Development, Ideas and Methods Exchange No. 68 (Washington, D.C., 1971, 67 pp.). Study reviews experiences and discusses basic components of sites and services projects and programs.

World Bank. "Housing Sector Policy Paper" (Washington: IPHO, 1975, 75 pp. Also available in French, Spanish, and Arabic). This concise document discusses housing conditions, economics, policy alternatives, and foreign assistance programs and experiences. Included is a statistical annex.

World Bank. "Sites and Services: A World Bank Paper" (Washington: IBRD, 1974, 47 pp.). Important methodological aspects related to sites and services projects are discussed including: target population, design, financing, organization, and project evaluation.

Yeh, Stephen H.K. and A.A. Laquian, eds. Housing Asia's Millions: Problems, Policies and Prospects for Low-Cost Housing in Southeast Asia (Ottawa: International Development Research Centre, 1979, 247 pp.). The ten comparative analyses in this book are based on indepth country studies and address such issues as housing conditions and needs, policy, administration, finance, land, technical specifications, and future prospects.

NOTES

1. Orville Grimes, Housing for Low-Income Families: Economics and Policy in the Developing world, Published for the World Bank (Baltimore: Johns Hopkins University Press, 1976), Table A1, Part C, pp. 116-117.
2. Ibid, p. 32.
3. Ibid, p. 32.
4. United Nations, "Draft Principles and Recommendations for Population and Housing Censuses. Part Three, Topics and Tabulations for Housing Censuses," E/CN.3/515/Add.3 (New York: U.N., 1978).
5. Patrick I. Wakley, Hartmut Sennetzer, and Barbara K. Muntaz, Urban Housing Strategies: Education and Realization (London: Pitman, 1975).
6. Ibid.
7. United Nations, "Non-Conventional Financing of Housing for Low-income Households," ST/ESA/83 (New York: U.N., 1978, Sales No. E.78.IV.11).
8. United Nations, "Methods of Estimating Housing Needs," ST/STAT/SER.F/12 (New York: U.N., 1978, Sales No. E.78.IV.12).
9. Ibid, p. 34.
10. Wakely et al (See note 5, above).

* Particularly useful sources of further information.

Part 5

Case Studies

12

Panama Case Study

BACKGROUND

Panama is a small Latin American Republic with a population of approximately 1.7 million. The dynamic modern metropolitan core, situated along the canal between Panama City and Colon, can be contrasted to the more traditional, rural, and underdeveloped rest of the country. The historical evolution of this spatial structure is related closely to the development of the Panama City-Colon transit corridor, the relatively meager resources within the rest of the country, and the socioeconomic dynamics of polarized development. About fifty percent of the population and more than eighty percent of all economic activity are located in the metropolitan corridor. In contrast, the rest of the country is thinly populated and demonstrates a far lower degree of socioeconomic development.

The six western provinces contain almost all of the nonmetropolitan population and are characterized by topographic and agriculture diversity. Agriculture is the major economic activity and main products include cattle, bananas (grown in large foreign owned plantations), rice, sugar cane, corn, and tomatoes. Agricultural and economic activities in western Panama are not integrated with the metropolitan corridor economy. Productivity is low and medium family income is only about one third of that in Panama City. The two largest towns are relatively small, David (55,000) and Chitre-los Santos (35,000). Lack of effective urban-rural linkages acts as a constraint to development.

Recognizing the undesirable consequences of polarized development, the Government of Panama began to focus increased attention on regional development in the mid 1960s. The Government's regional development strategy, which stems from commitment at the highest political levels and is articulated in the National Development Plan, focuses on western Panama. The Growth and Service Centers Project is a major component of this strategy. The objective of the project is to improve the ability of towns to provide needed services to their surrounding

agricultural hinterlands. The project calls for strengthened urban-rural linkages and upgraded infrastructure in market towns.

The Government of Panama obtained technical and capital assistance with project design and implementation from the United States Agency for International Development (USAID). The design and coordination of the Growth and Service Centers Project is the responsibility of the Ministry of Planning and Economic Policy (MIPPE). A number of different governmental agencies are participating in project implementation.

Project identification documents indicated that effective development of the project design required that certain urban and regional analyses be performed. Studies were needed to locate and assess poverty groups, to identify the urban hierarchy and urban-rural linkages, to appraise small and agribusiness potential, and to determine infrastructural needs.

MIPPE and the USAID Mission to Panama entered into a project agreement for undertaking the analyses. MIPPE assumed principle responsibility for coordinating the studies and contributed managerial, professional, and clerical personnel as well as logistic support. With the assistance of USAID's Office of Urban Development, the Mission contributed ten work months of consultant technical assistance in the form of an urban-regional analyst and an agribusiness expert.

ANALYSES

Proposed Household Survey

The initial design for the analysis called for a relatively large household survey. The primary reasons for the survey were:

1. To update and supplement the 1970 census.
2. To provide new information (not available from existing sources) on beneficiary characteristics (income, poverty, nutrition, socio-cultural attributes), rural-urban linkages, migration, and agricultural production.
3. To supply information for designing and implementing the project.
4. To provide project baseline data which later could be compared to 1980 census data and/or postproject surveys.

According to the initial analysis schedule, the survey was to be conducted by the Panama census organization during 1977. A preliminary questionnaire was developed and a tentative work schedule adopted.

As work on the survey continued, doubt began to surface. Was it possible to complete the survey by the end of 1977? Was a

survey, absolutely necessary? As is often the case, the initial decision to conduct the survey was not based on a complete appreciation of the amount of time and money it would require. The preliminary questionnaire was lengthy because every agency participating in the project included questions concerning their involvement and interests. The census office would not be able to complete the survey by the end of 1977 because they were overloaded with two other large surveys. Consideration was given to delaying the survey until 1978.

After much debate, a decision was made to cancel the survey for the following reasons:

1. The census office already had a heavy work load and were beginning to prepare for the 1980 census.
2. The survey would be more costly and time consuming than originally thought.
3. Efforts to identify and assess existing data sources revealed that they probably would be sufficient to meet immediate project needs.
4. The 1980 census would duplicate much of the data to be provided by the proposed survey.
5. The time required to collect and analyze the survey data would delay project design and implementation by perhaps a year.

The decision to cancel the survey in Panama is instructive for two reasons. First, it demonstrates the iterative nature of analysis. Initial decisions are made based on information available at the time. When additional information is collected or when results from preliminary analyses are obtained, initial decisions may have to be changed. Second, the decision to first conduct a survey and then to cancel it demonstrates the tendency to underestimate the time and cost required for quality surveys. As this book emphasizes in several places, household surveys should be conducted only when absolutely necessary; existing data often are adequate for most types of urban and regional analysis.

Spatial Distribution of Poverty

One of the important components of the preproject analysis was an investigation of the spatial distribution of poverty in western Panama. Though data from the proposed survey would have contributed to this analysis, existing data sources were adequate. Three approaches were used to analyze the spatial distribution of poverty.

Poverty Line Approach. The first approach utilized was the poverty line approach developed by Richard Webb.¹ Three elements are

needed to implement this approach: (1) a poverty line, (2) income distribution data, and (3) population data. The widely used figure in USAID of \$150 per capita (1969 dollars) was used as the poverty line. It was recognized that this figure probably underestimated poverty in Panama, a country with an estimated 1975 per capita GNP of \$1,100. In addition, this figure overlooked differences in the cost of living between urban and rural areas. Despite these drawbacks, the \$150 per capita figure was used because data were not available to develop a more appropriate poverty line, such as the cost of a "minimum market basket" of basic necessities.

Income distribution data for urban and rural components of each of the six provinces were obtained from a government household expenditure survey conducted in 1975. The data were sufficient for the poverty line analysis even though they represent family expenditures for only one month and are subject to all the inherent problems of income surveys, such as recall of expenditures and within household production and consumption. Though the survey attempted to evaluate on-farm production and consumption, it still tended to exaggerate urban-rural income differences. To be consistent with poverty line figures, the income data were discounted back to 1969 using an annual inflation rate of six percent. A comparison of the distribution of annual family income with the poverty line revealed the percentage of families below the poverty line in urban and rural areas of each province. These percentages were combined with census data on population and family size to determine the actual number of people living below the poverty line in each province.

According to the analysis, about 15,000 or about ten percent of the urban population in the project area were living below the poverty line. In contrast, 260,000 or forty-eight percent of the rural population were living in poverty. The combined poverty rate for the urban and rural population in the project area was thirty-nine percent compared to a rate of twenty-four percent for all of Panama. In addition, the household income distribution data were used to investigate spatial differences in median family income. The data revealed that in 1975, median family income was \$995 (urban - \$2,186, rural - \$763). In contrast, median family income in metropolitan Panama City was \$2,754.

Though the analysis of the expenditure survey provided useful information concerning incidence of poverty in the project area, the analysis is not without limitations. First, it treats poverty as a dichotomous variable, people were labeled as being either "poor" or "not poor". No attention was focused on how far people were above or below the poverty line. In actuality, poverty is a continuously distributed phenomenon and multiple poverty lines are needed to investigate degrees of poverty. Second, the income distribution data were available for only twelve spatial units in the project area -- that is, the urban and rural portions of the six provinces. Although this was far greater detail than usually is available in national surveys, it still was too crude for project planning. In other words, the analysis did not provide a

detailed answer concerning "the where" of poverty. Third, the analysis was based on one reasonable, but still arbitrary, poverty line for both urban and rural areas. In reality, costs of a minimum standard of living vary considerably between urban and rural areas. In general, the cost of living is higher in urban areas; therefore, the use of one poverty line tends to underestimate poverty in urban areas and consequently overstate urban-rural differences. Fourth, there is evidence that the household survey data also overstate urban-rural differences in income. Urban populations in many provinces were very small and correspondingly extremely small household samples were obtained. Thus sampling error in urban areas could have been considerable. In addition, empirical regression models calibrated from the data fit very well for provincial aggregates, but poorly for the separate urban and rural components.² This suggests that the data represented well the total provincial population but were less representative of the separate urban and rural populations. In summary, though the poverty line analysis has a number of drawbacks, it provided an objective and accurate description of the incidence of poverty in the project area. This description provided ample evidence that there was sufficient poverty in the project area to warrant international development assistance.

Poverty Indicators Approach. To overcome some of the drawbacks of the poverty line approach, the study team also analyzed the spatial distribution of poverty using a number of poverty indicators.³ This approach, which is based on the idea that poverty is something more than lack of monetary income, has the advantage of avoiding difficulties associated with comparing urban and rural incomes. Numerous variables were selected from the 1970 census to represent important dimensions of poverty. Because the census contains a high level of spatial detail, poverty indicators were available for each of the forty-eight districts in the project area.

The team selected different indicators to represent "relative" and "absolute" poverty. Indicators of relative poverty were formulated on percentage, per capita, or per area basis within each district. On the other hand, indicators of absolute poverty were based on the total values in each district. For example, ninety-two percent of the population in Ola District and only nine percent in David lived in dwellings without sanitary facilities; these are statements about relative poverty. But a total 936 households in David were without sanitary facilities, compared to only 814 in Ola; according to the study team's definition, these figures describe absolute poverty.

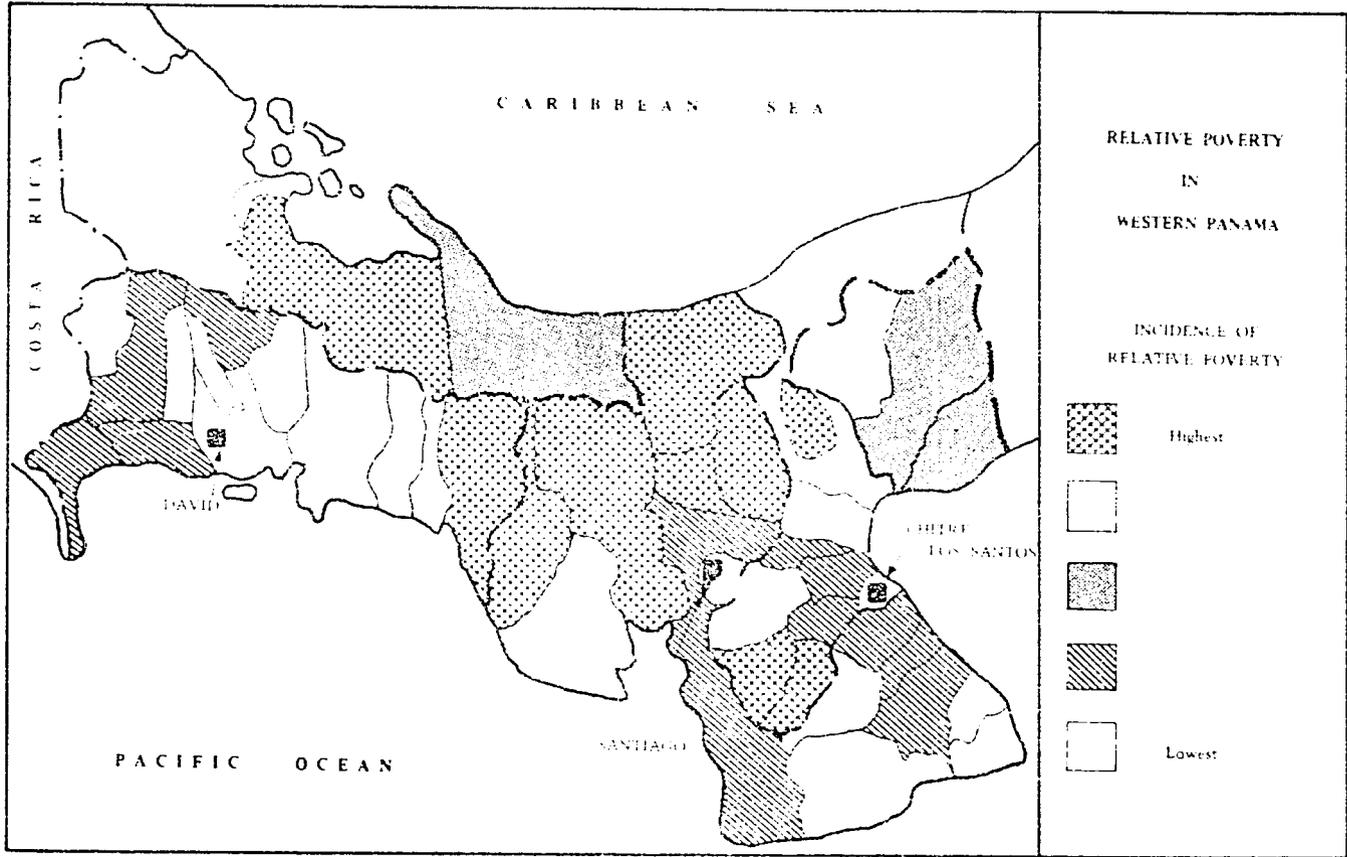
Several of the variables were mapped to show the spatial distribution of poverty. Maps of indicators of relative poverty revealed that the highest incidence of poverty was in isolated districts and those with a high proportion of indigenous Indian population. In contrast, maps of indicators of absolute poverty revealed districts with the largest number of poor people; these included David and Chitre-Los Santos, districts containing the two largest towns in the project area.

As expected, the different poverty indicators used were highly correlated - i.e., districts with a high percentage of houses with dirt floors also had a high percentage of houses without electricity, and without radios, etc. In short, all of the indicators are different measures of a single concept, poverty. The different indicators were used to develop a single, summary measure of poverty using principle components analysis. This computerized analysis produced one summary component or factor which best represented all the indicators of relative poverty used in the analysis. The analysis also assigned a score on this factor to each district. These scores were used to develop a map which describes concisely the spatial distribution of relative poverty in the project area (Figure 12.1). A separate principle components analysis was used to develop a map of absolute poverty (Figure 12.2); this map represents the distribution of poor people and therefore indicates areas of western Panama in need of poverty program focus.

The poverty indicators analysis was successful because it incorporated a large number of variables which are known to be related to poverty rather than concentrating on a single variable, such as income, which can be misleading. On the other hand, use of many variables may lead to data overload and confusion in the minds of decision makers and project planners. The components analysis overcame this problem by efficiently combining numerous variables to develop summary measures of relative and absolute poverty. However, components analysis is a relatively sophisticated statistical technique which produces abstract, synthetic measures; this makes the results of the analysis somewhat difficult to interpret, especially for decision makers and project design personnel who are not familiar with the technique.

Combining Income and Social Indicators Approaches. The team combined data from the government household expenditure survey and the census to estimate median family income for each of forty-eight districts. The district scores on the principle component summary measure of relative poverty were weighted by population and combined to produce a summary measure of relative poverty for each of the six provinces. A tight fitting ($R^2 = .91$) regression model was calibrated, using province level data, to estimate median income from the summary measure of relative poverty.⁴ Next, the regression model was used with the district level principle component summary measures of relative poverty to estimate median family income in each of the forty-eight districts. This straightforward procedure resulted in estimates of median family income at a high degree of spatial detail. These estimates were mapped to indicate the spatial distribution of poverty in the project area. The value of this ingenious approach is that it makes maximum use of available data to provide median income figures for relatively small spatial units.

Figure 12.1 RELATIVE POVERTY IN WESTERN PANAMA



Central Place Service Centers and Rural-Urban Linkages

Analyses were conducted to identify potential growth and service centers in the project area and to investigate linkages between these centers and their rural hinterlands.

Selection of Growth and Service Centers. Three criteria were used to select growth and service centers for project focus: (1) population size and migration dynamics; (2) level of service provision; and (3) spacing and extent of rural hinterlands.

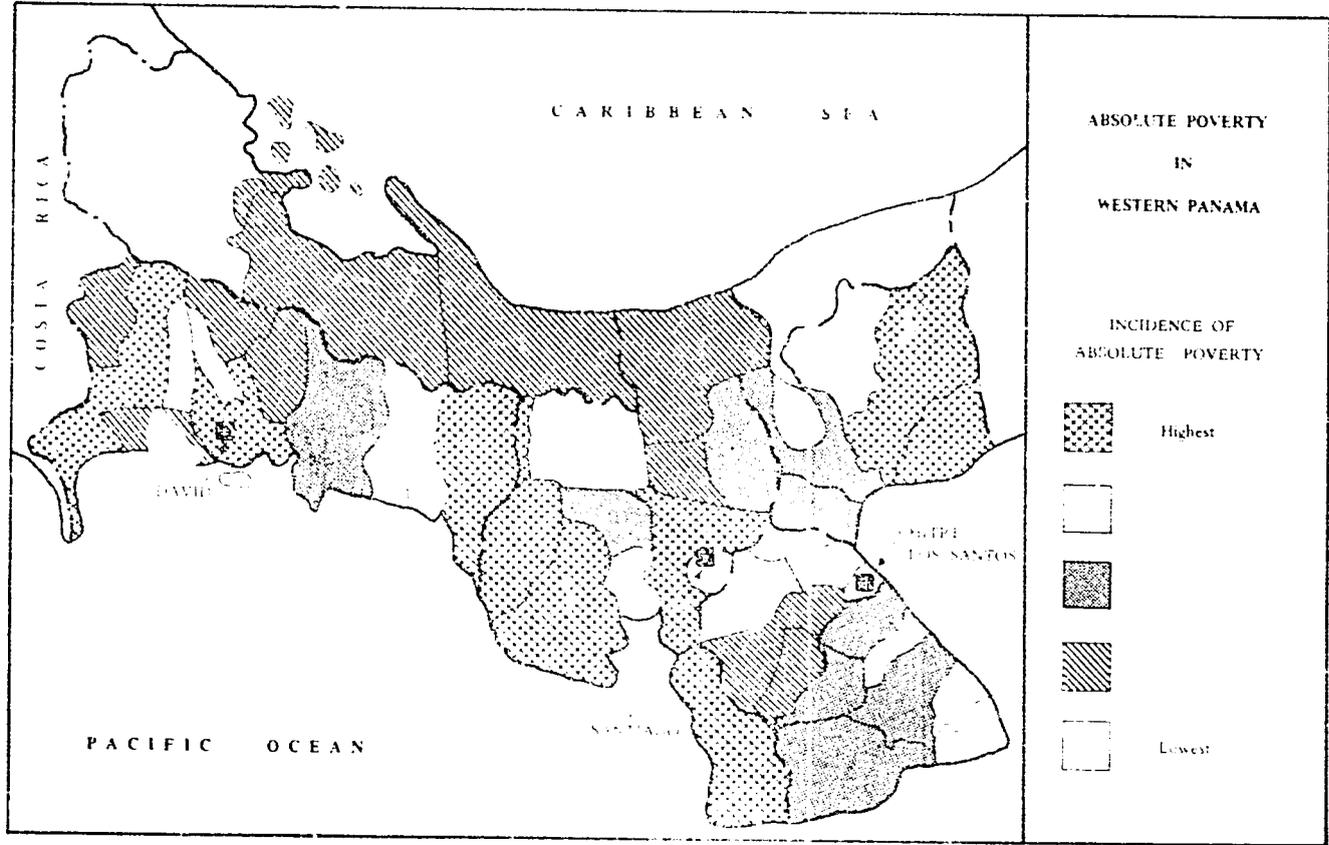
The census data indicated that only three districts experienced net in-migration between the 1960 and 1970 censuses. Two of these districts contained the largest urban centers in the region, David and Chitre-Los Santos. In addition to these two, a number of smaller centers (populations 5,000-20,000) also experienced relatively rapid population growth, thus demonstrating potential for future growth.

To analyze the level of urban service provision in the region, the analysis team used an existing study based on information from the 1971 Economic Census, the 1975 Census of Establishments (employing five or more people), and a survey of establishments employing less than five persons.⁵ The existing study indicated, for each district in the region, the number of functions provided as well as number of employees and revenues. It was assumed that the functions present in a district were provided by the largest urban center in the district. The centers in the region were ranked by number of functions provided and a hierarchy was developed. The analysis revealed that David and Chitre-Los Santos provided far more services than other centers and were definitely at the top of the urban hierarchy. These centers each are located centrally in major agricultural areas.

The population and function data also suggested a number of candidate service centers. The analysis team plotted these centers on maps which contained district boundaries, the road network, and physical barriers such as rivers and mountains. The maps indicated that some of the candidate service centers were located quite near larger centers which could serve the hinterlands of the smaller centers; consequently, these centers were dropped. In the end, six service centers were selected.

One service center, Santiago, is actually mid-way between the larger growth centers and smaller service centers. Its rapidly growing population, relatively large and increasing number of services, recent selection as the site of the Ministry of Agriculture, and location on the Inter-American highway suggest that it will develop into a growth center in the near future. In addition, a number of smaller centers were selected as incipient service centers based on their location in areas which were not served well by the other growth and service centers and their potential to develop the needed service capacity.

Figure 12.2 ABSOLUTE POVERTY IN WESTERN PANAMA



Analysis of Urban and Rural Linkages. The degree to which subprojects scheduled for the growth and service centers will benefit rural populations is dependent upon the adequacy of urban-rural linkages. Consequently, an analysis was conducted to identify and appraise these linkages. Unfortunately, Panama, like most other countries, is lacking in linkage data such as daily travel patterns and flows of commodities. The most useful data for analyzing urban-rural linkages are contained in detailed origin and destination (O-D) surveys of road transport. The World Bank supported a detailed O-D study in Panama in 1974; however, the final report from the study aggregated the data to a point where they were of very limited value. Concerted efforts by the study team to uncover the raw data were unsuccessful.

In the absence of data on the flows of people and goods in the region, the study team collected, from Government agencies, linkage related data including the following:

Ministry of Public Works traffic counts along the road networks (perhaps the best indicator of linkages available in Panama)

The density of maintained roads in each district

Cultivated area per kilometer of road

Population per vehicle and per road kilometer

Availability of mail and communication facilities

These data, in conjunction with maps showing road networks, district boundaries, and physical barriers, were used to delineate hinterland areas of the growth and service centers. In addition, the available linkage data for each district were used in a components analysis to develop a summary measure of linkages and access to the growth and service centers. The analysis indicated that two centers, Las Tablas and Penonome, had the weakest linkages with their hinterlands and consequently were most in need of priority attention in terms of strengthening outreach capability. This relatively complicated components analysis of urban-rural linkages provided only slightly more information than was available from the original data.

Housing Analysis

Because the proposed project included an important housing component, several aspects of housing were investigated including the housing problem, housing institutions, the shelter delivery system, and the ability of the beneficiaries to pay for housing solutions.

Housing Problem

Analysis of the housing problem was based on data from the 1970 census and information from housing agencies. Several of the census variables used in the analysis of poverty are related to

housing; for example, houses with shared facilities, dirt floors, no sanitary service, no potable water, no bath, no electricity, and houses classified as improvised. Though the census data suggested that the worst housing problems were in rural areas, they also indicated serious problems in urban centers. For example, 300 of the 4,000 housing units in Santiago at the time of the 1970 census either were classified as "improvised" (dirt floors, walls of timber, cardboard, zinc, clay or discarded materials) or shared facilities (water, toilets, baths) or had three or more persons per room. The number of such units had increased to an estimated 650 by 1978 and housed some 3,500 people.

Additional information on the housing problem was obtained from a Ministry of Housing survey in 1976 which provided data on 112 housing units in shanty towns in Chitre. These units, which housed over 500 people, were without access to sewerage and had only limited access to electricity. In summary, the analysis of the housing problem indicated that shelter was a serious problem, which, if unattended, could jeopardize the success of the project.

Housing Institutions. This investigation was conducted by contacting a variety of housing related agencies:

- Ministry of Housing
- National Water and Sewerage Institute
- Institute for Hydraulic and Electric Resources
- Ministry of Planning and Economic Policy
- Panamanian Foundation for Cooperative Housing
- Ministry of Public Works
- National Mortgage Bank
- National Bank of Panama
- National Savings Bank
- Social Security Bank
- Savings and Loan Institutions
- Credit Unions
- Panama Construction Association

These agencies were assessed in terms of their role in the shelter delivery system, their capability to carry out their responsibilities, their organizational structure and operating procedures, their financial and other resources, and their involvement with the provision of low income housing. As a result of these assessments, it was decided that as part of the project, technical assistance should be provided to the Ministry of Housing to upgrade their information system and planning capability, and to the National Mortgage Bank to improve their auditing and financial management capability.

Shelter Delivery System. In addition to housing related agencies, other aspects of the shelter delivery system were investigated including the construction industry, availability of land, and provision of housing infrastructure. Information from the Ministry

of Housing and the Panamanian Construction Association indicated a surplus in Panama of architects, construction firms, construction workers, and building materials (steel, PVC tubes, wood and concrete). In addition, the informal sector and self-help housing schemes were adding to the pool of construction manpower in the country. Housing agencies indicated that there was more than a sufficient supply of suitable land for housing in the growth and service centers.

Housing Economic Analysis. The ability of project beneficiaries to pay for selected housing solutions was investigated using income data from the poverty analysis and estimates of housing costs. Data from the 1975 household survey were used to estimate the income distribution in each of the selected growth and service centers. Families in lower income levels usually spend a smaller percentage of their income for shelter, therefore the following general criteria were used to determine affordability of housing solutions:⁶

<u>Income Percentiles</u>	<u>Percentage Income for Shelter</u>
10 - 20%	7 - 15%
20 - 30%	10 - 18%
30 - 40%	18 - 21%
40 - 50%	20 - 25%

The percentage income for shelter was multiplied by monthly income for each decile in each center to determine estimated affordable monthly housing payments. Operating procedures of major mortgage institutions were used to estimate loan characteristics (interest rates, duration of mortgages, and down payments). Interest tables then were used in conjunction with affordable monthly housing payments to determine the maximum cost of affordable housing solutions for each income decile in each center.

Building cost estimates for 1978 were used to identify the types of housing solutions affordable by each income group. Costs which were considered included: land, surveying, certification, water, roads, drainage, electricity, and house construction. Seven types of housing solutions were identified.⁷

1. Serviced Sites: Lots of 300 square meters with water connections and gravel road access for families in the 10th to 20th income percentile.
2. Home Improvement Loans: For families in the 10th to 20th percentiles who currently own but need to upgrade their units.

3. Core Units: 36 square meter concrete block units for families in the 10th to 20th percentiles who own building sites.
4. Urbanized Lots: On gravel roads with water, sewer, and electrical service; for families in the 10th to 20th percentiles.
5. Units on Owned Land: 45 square meter, two bedroom units for families in the 20th to 40th percentiles who own building sites.
6. Serviced Units: Similar to 5 except with electricity added for families in 20th to 40th percentiles.
7. Fully Serviced Units: Similar to 6 except with sewerage added for families in 30th to 50th percentiles.

In conclusion, the housing analysis conducted in Panama illustrated how relatively limited, but available information can be used to assess the housing problem and suggest a range of potential solutions.

DEVELOPMENT INTERVENTIONS BASED ON THE ANALYSIS

The goal of this activity was to identify types and locations of appropriate development activities which could be used as the basis of regional development efforts. The identification of specific development interventions historically has been one of the most difficult aspects of regional analysis because it requires linking theoretical concepts, economic and political realities, existing and usually sparse information and data, and the explicit and implicit goals of the numerous and sometimes diverse organizations involved in the development process. Not surprisingly, decisions concerning specific regional development interventions rely in large measure on previous experience and intuitive judgment.

The selection of regional development interventions for western Panama was based on growth center and location theory, knowledge of the economy and resource base of region, results from the analyses described above, and the specific objectives of the project. Growth center theory indicates that selected productive activities in key locations can stimulate regional development. Agricultural production is the major economic activity of the region and has potential for growth as evidenced by soil and climatic factors, current low yields and population densities, and relatively large food imports for the country. The analysis of poverty, census data on unemployment rates, and information on rural underemployment indicate that labor is a valuable and underutilized resource in the region. These two key regional resources, agricultural potential and labor, are related to the

objectives of the project -- namely, employment generation and strengthened urban-rural linkages. Integration of these factors (growth center theory, agricultural and labor resources, and project objectives) suggested that additional agriprocessing activity was a suitable focus for the development intervention. In addition, the relatively large amount of food imported to Panama indicated the existence of a viable market for additional agriproducts.

To promote additional agriprocessing activities in the region, specific interventions were needed which would entice private entrepreneurs to invest in the region. Empirical experience and location theory indicate that industrial location decisions are influenced by:

Transportation costs of moving raw materials to factories and final products to market.

Agglomeration economies (associated with the linkages to related industries and economies of scale in the provision of infrastructure).

Supply of raw materials and labor.

Entrepreneur preferences concerning the attractiveness of the location as a place of residence.

Because it is easier and cheaper to transport finished agriproducts than raw and perishable agricultural commodities, agriprocessing activities should be located in agricultural areas. In the case of Panama, these activities should be located in the project area instead of in the Panama City Metropolitan Area. Within the project area, the growth centers of David and Chitre-Los Santos are natural locations for these activities because they are transportation centers and they provide the best agglomeration economics. The six service centers are also reasonable locations for some agriprocessing industries.

In order to stimulate investment in agriprocessing and related activities in these centers, a number of specific development interventions were identified. Industrial sites were planned for David and Chitre-Los Santos to strengthen physical infrastructure (land, transport routes, water and electricity), promote development of linked industries, and stimulate planned urban development. Financial incentives were provided by a agriprocessing loan program and a Government of Panama tax concession scheme. To promote the improvement of business and commercial services, a small enterprise loan fund was proposed. A series of existing and proposed activities were designed to improve the production of agricultural raw materials; these included resettlement schemes, development of cooperatives, an integrated rural development program, and improvements in marketing and

storage facilities. Road improvement projects were directed at improving the flow of agricultural commodities from rural areas into the centers. To complement road improvement projects, bus terminals were proposed for the three major transportation hubs in the region. The terminals would be located and operated to reduce congestion and provide farmers with improved access to needed urban based agricultural services such as credit, fertilizer, seed, implements, markets, etc.

To improve directly the quality of labor, a worker training program was proposed. Indirect long term improvements to labor supply would result from road improvement and bus terminal subprojects which increase rural access to social services such as health and education. Also, improved roads and bus terminals would streamline the daily commuting of rural labor to jobs generated by the proposed agriprocessing activities.

Interventions also were proposed to enhance the residential attractiveness of the centers to the entrepreneurs and mid-level personnel needed to operate agriprocessing enterprises. These interventions included provision of housing, improved sewerage, cultural and recreational facilities, as well as the bus terminals. Workers in the agriprocessing industries and other urban residents also would benefit from these activities.

NOTES

1. Richard Webb, "On the Statistical Mapping of Urban Poverty and Employment," World Bank Staff Working Paper No. 227 (Washington: IBRD, 1976).
2. Thomas H. Eighny and Agustin Garcia L., "Mapping the Poverty Line in Western Panama," Prepared for the Agency for International Development (Washington, D.C.: AID, 1977), mimeo.
3. Ibid.
4. Ibid, pp. 97-103.
5. Charles P. Boyce, "The Urban System of Panama: Present State and Future Prospects," mimeo, n.d.
6. U.S. Agency for International Development, Mission to Panama, "Rural Growth and Service Centers," Project Paper (Washington, D.C.: AID, 1978, mimeo), Annex 11, p. 23.
7. Ibid, pp. 37-38.

13

Costa Rica Case Study

BACKGROUND

Costa Rica is the second smallest republic in Central America; its population in 1977 was 2.1 million. Most social and economic indicators show Costa Rica to be relatively advanced by Central American standards. It has fairly low rates of births, deaths, and infant mortality while life expectancy is high. The per capita GNP in 1979 was \$1430. Agriculture is the primary economic activity and major crops include coffee, bananas, livestock, cacao, sugar, basic grains, and forestry products. Important industries are processed foods, chemicals, textiles and tourism.

About forty-five percent of the Costa Rican population live in the greater urbanized region of the capital city, San Jose. This region includes the San Jose Metropolitan Area, which is the focus of this case study and contains about 600,000 people. While the incidence of poverty in San Jose is less than that in the rest of the country, there is still widespread poverty in the city. A blatant visible manifestation of this is the expansion of tugurios, a term used to describe the slums and shanty towns in San Jose. During the period 1973-1976, the plight of the urban poor worsened as inflation outpaced wages; real income of the urban poor, already marginal in 1973, declined by over twenty percent.

During this period the Government of Costa Rica focused development efforts on rural areas. Factors which contributed to the success of the rural development program included government commitment to the rural poor, ready availability of land, provision of social and economic infrastructure, and a program of improved agricultural production.

As conditions in rural areas improved and urban poverty increased, the government began to focus more attention on the urban poor, especially tugurio residents. The National Housing Agency undertook an inventory which identified 118 separate tugurios spotted in all cantons of the city. Tugurio population in 1973 was estimated at about 75,000. The government decided to undertake a number of urban poverty projects as part of a balanced

urban program. The initial project focused on increased employment opportunities and better provision of housing and related infrastructure.

The National Planning Office (OFIPLAN) was charged with conducting preproject investigations and developing the project design. The United States Agency for International Development (USAID) agreed to provide technical and capital assistance with project design and implementation. The development and review of project identification documents indicated a need for a more thorough understanding of poverty in San Jose. Data collection and analysis were required on the social and economic characteristics of the poor as well as their interactions with the existing employment, housing, and infrastructure systems. OFIPLAN assumed primary responsibility for the analysis and contributed fifteen person months of professional and managerial resources as well as clerical and logistical support. With the assistance of AID's Office of Urban Development, the USAID Mission contributed five person months of U.S. technical assistance as well as support for an additional twenty-four person months of local professional input.

As is often the case, the different agencies involved in the analysis were not in perfect agreement with respect to information needed for project approval documents, types of analysis required, operating procedures, or scheduling of deadlines. For example, the statistics branch of the Ministry of the Presidency conducted a survey especially for the urban poverty assessment; however, only very preliminary results of the survey were available in time for inclusion in the analysis report required by USAID. OFIPLAN had a later deadline and therefore was able to include the survey results in its report. There were disagreements involving direct field observation in tugurios versus office analysis of existing data. This disagreement between the different agencies and individuals involved in the analysis was never resolved completely. Despite these minor differences which exist in all cooperative efforts, the analysis was relatively successful.

ANALYSES PERFORMED¹

National Urban and Regional Development Policy

To investigate the explicit urban and regional development policy, the study team utilized the 1978-82 National Development Plan. The plan, which included less than one page on urban and regional development policy, mentioned the need to develop a system of regional towns and cities to reduce spatial inequities and migration to San Jose.

The implicit policy was identified by investigating government activities related to urban and regional development. A variety of public and private documents indicated that government efforts concentrated on rural development during the early 1970s and only began to focus on urban areas in the mid 1970s. The study

TABLE 13.1
San Jose Population Growth and Migration Rates
(per thousand per year)

	1950 - 1963	1963 - 1973
Birth Rate	43	32
Death Rate	9	6
Natural Increase	<u>34</u>	<u>26</u>
Population Growth Rate	47	39
Natural Increase	34	26
Net Migration Rate	<u>13</u>	<u>13</u>

team investigated a number of positive initiatives and actions taken by government to alleviate urban poverty. Although many of these initiatives were not implemented, they were indicative of government concern and attention to urban poverty. While this element of the analysis was rather sparse and primarily descriptive, it did suggest the orientation of the Government of Costa Rica toward urban and regional development.

Migration Analysis

Careful analysis of census data indicated that the rate of population growth in San Jose due to migration had remained relatively constant during the last few decades. The analysis compared migration rates between two intercensal periods, 1950-1963 and 1963-1973. To obtain growth due to migration, natural population increase (births minus deaths) was subtracted from total population growth (Table 13.1).

Though the rate of growth due to migration has remained relatively constant, the absolute number of migrants has increased. The 1950 base population was about 194,000, therefore the 13 per 1,000 rate involved about 2,500 migrants. In 1973 base population was nearly 500,000 and the same migration rate resulted in 6,500 migrants. The analysis team also compared the socioeconomic characteristics of migrants and nonmigrants; these are discussed in the next section.

Distribution and Characteristics of Poverty

This analysis investigated the incidence of poverty in tugurios, in Metropolitan San Jose as a whole, and among migrants and nonmigrants. The investigation provided some interesting and unexpected findings concerning the incidence of poverty in San Jose.

TABLE 13.2
San Jose Poverty and Subsistence Lines
(annual per capital requirements)

	1973		1977	
	Poverty	Subsistence	Poverty	Subsistence
Food	\$125	\$ 95	\$189	\$146
Clothing	15	11	22	16
Housing	89	58	153	110
Medicines & Health	9	4	11	4
Transport & Recreation	25	4	39	7
TOTAL	\$263	\$171	\$414	\$273

The study team developed two poverty benchmarks. The first benchmark, the poverty line, was based on the cost of a basket of goods which included a nutritionally adequate diet, minimal clothing, modest housing, transport, and some recreation. It did not include money for educational expenses. The subsistence line represented severe poverty and was about one-third lower than the poverty line. The two benchmarks were calculated by itemizing the costs of the goods and services included in the market baskets (Table 13.2). The costs were expressed in terms of 1973 prices to facilitate comparison with the 1973 census income data.

To determine the incidence of poverty, the poverty and subsistence income levels for 1973 were compared to income distribution data from the 1973 census (Table 13.3). The incidence of poverty was higher in tugurios than in nontugurios (thirty-two percent versus eighteen percent below subsistence and fifty-four percent versus thirty-three percent below poverty). However, only about half (fifty-four percent) of tugurio residents were poor and the number of poor in nontugurio areas was over three times as great as the number in tugurios (75,541 versus 23,307 below subsistence and 141,247 versus 39,735 below poverty level). These unexpected findings have important implications for development interventions. Projects which are limited to tugurio areas can only benefit one-fourth of the urban poor. The nontugurio poor are spread thinly throughout the Metropolitan Area and therefore are more difficult to reach with antipoverty programs.

TABLE 13.3
Poverty in San Jose

	Tugurio	Non-Tugurio	Total
Below Subsistence (\$171)	32% (23,307)	18% (75,541)	20% (98,848)
Below Poverty (\$263)	54% (39,735)	33% (141,247)	36% (180,982)
Above Poverty (\$263)	46% (34,015)	67% (268,319)	64% (320,334)
Total Area	100% (73,750)	100% (427,566)	100% (501,316)

The analysis of poverty has a number of advantages and limitations. The analysis was simple, straightforward, and utilized existing data; therefore, it could be conducted relatively quickly with limited resources. The analysis also provided an objective description of poverty in San Jose which belied commonly held beliefs about the concentration of poverty in tugurios. On the other hand, the approach is not without weaknesses. Income is not the only, nor the best indicator of poverty. The significance of living below the poverty line varies considerably from one family to the next depending on how well they allocate their resources. Census earnings figures do not reflect other types of income such as unrecorded transfers, government services, loans, and illegal income. In addition, analysts' perceptions of "minimum market baskets" may be in error. Finally, that a sizeable portion of people live "below the subsistence line" is a contradiction in terms. Some of these limitations could have been overcome if the results from the new tugurio survey had been available at an earlier date. Despite these weaknesses the analysis of poverty was quite successful because with minimal effort it captured the basic distribution of poverty in San Jose.

A study of poverty among migrants and nonmigrants dispelled the myth that most of the urban poor are recent migrants. The analysis used 1973 census data to compare the incomes of migrants (those who had lived in San Jose for less than five years) and nonmigrants. The comparison indicated that migrants were only slightly worse off than nonmigrants (Table 13.4).

Table 13.4
Poverty Among Migrants and Nonmigrants in San Jose.

	Migrants	Nonmigrants
Total Number of Families	100% (17,918)	100% (76,514)
Percentage Below Poverty Line	34% (6,096)	30% (22,954)
Percentage Below Subsistence Line	20% (3,586)	16% (12,954)
Percentage Living in <u>Tugurios</u>	16% (2,868)	14% (10,711)

Employment Analysis

As a first step to employment analysis, the study team investigated overall employment trends using various sources including the 1963 and 1973 censuses, Ministry of Labor, Central Bank, and 1976 Household Employment Survey. Rapid growth was observed for industrial, commercial, and public sectors while growth in agriculture was very slow. To analyze changes in employment structure and work force, the team also investigated, for different age and sex cohorts, trends in labor force participation, unemployment, and underemployment. For each age category, female labor force participation rates increased between 1963 and 1973 while male rates decreased. In addition, female unemployment rates for each age group rose during the 1963-1973 period while male rates declined. These findings are indicative of the recent movement of females into the labor force.

The analysis team used two different measures of underemployment. The first measure, "visible" underemployment, was the percentage of labor force who worked less than forty-seven hours per week and who wanted to work more. The second measure, "invisible" underemployment, was the percentage of labor force who worked forty-seven or more hours per week and who earned less than \$70 per month.

The team investigated both the supply and demand for tugurio labor. On the supply side, a few simple steps were used to estimate the current size of tugurio employment and unemployment. First, team assumed that the rate of growth of tugurio labor force was equal to the rate for the total Metropolitan Area. They used this rate, 4.2 percent per year, and the 1973 census, the most

recent comprehensive data available on tugurio employment, to estimate the current size of the tugurio labor force and the number employed and unemployed.

Preliminary results from the new survey were used to investigate characteristics of the tugurio labor force. The data indicated that there was a considerable supply of underutilized manpower in tugurios: seventeen percent were not employed but wanted to work, twelve percent sought work during the survey week, twenty-four percent previously had held jobs but were not currently working, nineteen percent were attending courses, and sixty-eight percent said they would like additional training. The working conditions of employed tugurio residents also were investigated including occupations, hours, wages, length of present job, and type of current employer. The analysis of the census and survey data suggested two possible avenues for development interventions. First, there was evidence of desire and need for additional job training which would improve the supply of tugurio labor. Second, a sizeable proportion of tugurio workers were employed by small scale enterprises; consequently, efforts could be made to expand this sector and thereby increase the demand for tugurio labor.

Survey data on both small and large firms were used to investigate the demand for labor. An American consulting firm was hired to survey businesses with less than ten employees. The majority of employees in these firms was classified as "unskilled." Firm owners were optimistic about expansion; planned new investment exceeded the current net worth of the firms surveyed. By assuming that the present ratio of capital to labor would be maintained, the study estimated that investment needed per new job was \$1,300.

Data on firms with over ten employees were obtained from a survey by the Ministry of Labor and from the Statistics and Census Office. Interestingly, this survey revealed a vacancy rate of about sixteen percent; in addition, about forty percent of these vacancies had existed for two months or more. Employers indicated that about two-thirds of the vacancies could not be filled because appropriately skilled workers could not be obtained in the existing labor market.

Housing and Related Infrastructure

Housing Conditions. Based on 1963 and 1973 census indicators, housing conditions in both Costa Rica and Metropolitan San Jose improved considerably during the decade (Table 13.5). The 1973 census data also were used to make rough estimates of the housing deficit. Houses in "poor" condition and those in "fair" condition but overcrowded were assumed to be deficient. This assumption may have overstated the need for new houses because many of the overcrowded "fair" units could be removed from the deficit by the addition of a room or two. On the other hand, many of the houses in "poor" condition had more than one family, thus necessitating the construction of two or more new houses to eliminate one deficient unit.

Table 13.5
Housing Conditions

	Costa Rica		Metropolitan San Jose		Tugurios
	1963	1973	1963	1973	1977
"Good" Condition	32%	54%	49%	65%	22%
"Poor" Condition	34	14	19	10	33
Wood Construction	86	78	79	64	86
Concrete Construction	6	17	15	33	9
Indoor Plumbing	57	72	93	97	84
Sewer or Septic Tank	30	42	61	78	58
Overcrowded (Over two persons per room)	26	22	18	16	32
Owner Occupied	56	60	48	53	38

Housing conditions in tugurios were assessed using preliminary data from the survey of 575 tugurio homes in June 1977. Deteriorated housing was the primary criterion used to identify tugurios; consequently, housing in these areas was considerably worse than housing in the rest of San Jose (Tables 13.5 and 13.6). On the other hand, twenty-two percent of tugurio housing was classified as "good" indicating that tugurio housing is far from homogeneous; solid housing often is located beside deteriorating shacks.

Table 13.6
Housing Deficiencies

	Total Housing Units	Housing In "Poor" Condition	Over- Crowded "Fair" Houses	Total Deficit Units	Percent Housing Units Deficient
Costa Rica	330,857	44,622	32,315	76,937	23.2%
Metropolitan San Jose	156,194	15,797	9,755	25,552	16.4
Tugurio (sample)	575	193	81	274	47.7%

Housing Supply. The supply of housing is affected by the construction industry, construction codes and permits, land use and availability, and housing development and finance institutions. Though the analysis team investigated all of these supply factors, they focused most of their attention on housing development and finance institutions.

Much of the information on the construction industry came from the National Housing Agency. Information was obtained on large construction firms, small contractors, construction workers, and supply of building materials. There was a sufficient supply of unskilled workers; however, skilled workers were few and could form a bottleneck to rapid increase in housing construction. While eight percent of housing construction materials were supplied locally, the supply of two major materials, wood and concrete, was dwindling. A new cement plant was planned to facilitate the transition from traditional wood to concrete as the main building material.

Information on construction codes was obtained from a variety of housing and related agencies. Costa Rica does not have a unified construction code; consequently, construction is regulated by a series of unrelated standards administered by a variety of national and local agencies. Municipalities are ultimately responsible for issuing construction permits and collecting real estate taxes. Unfortunately, municipalities generally are opposed to affordable standards because they allege that low cost housing turns into instant slums. High building standards hamper efforts to provide low income housing and lead to squatter settlements with no standards and no controls.

Though forty percent of the population of Costa Rica lives in the San Jose urban agglomeration, there still is considerable land available for housing. To avoid possible future land shortages and inappropriate use of land, the study team recommended the adoption of a national land use program. In addition, to facilitate shanty improvement, land title programs for squatters were recommended.

The study team used a simple framework to investigate housing development and finance institutions. For each institution information was sought on: size of housing investments and sources of funds, credit terms and conditions, and income group benefitted. Generally speaking, the needed information was collected directly from relevant institutions; these included the national banking system, savings and loan system, Social Assistance Institute, National Housing Agency, Social Interest Housing Agency, Social Security Fund, National Insurance Institute, and People's Communal Development Bank. Use of this simple framework enabled the team to assess the impact on low income groups of the multitude of Costa Rican agencies involved in housing development and finance. The simple framework also enabled the team to appraise coordination and duplication of functions among agencies. By projecting and adding housing investments of each agency and by assuming these agencies would continue to make ninety percent of their loans in the San Jose urban agglomeration, the team estimated

TABLE 13.7
ECONOMIC ANALYSIS OF SAN JOSE HOUSING

	Family Monthly Income Level							
	Under \$70	\$70- \$140	\$140- \$211	\$211- \$281	\$281- \$421	\$421- \$562	\$562- \$703	Over \$703
1. Percentage of Families	4.5%	17.3%	17.1%	15.2%	19.7%	10.1%	4.9%	11.2%
2. Number of New Families	298	1134	1120	1000	1292	662	324	737
3. Replaced Housing	755	503	251					
4. Obsolete Housing	39	148	146	131	169	87	42	96
5. Total Number of Units	1092	1785	1517	1131	1461	749	366	833
6. Monthly Payment	\$9	\$16	\$36	\$63	\$89	\$125	\$161	\$238
7. Average Loan	\$950	\$1789	\$3964	\$6905	\$9881	\$13810	\$17738	\$26190
8. Average House Cost	\$1060	\$1964	\$4357	\$7679	\$10976	\$15345	\$19714	\$29095
9. Total Finance Requirement (\$ millions)	\$1.0	\$3.2	\$5.5	\$7.8	\$14.4	\$10.4	\$6.5	\$21.8

NOTE: 1. Does not include units for families currently renting.

2. Total finance requirement for all income groups: \$70.6 million.

that \$66.3 would be available for housing finance in 1977-78. This was compared to the demand of \$70.6 million (Table 13.7) and found to be lacking by \$4.3 million.

Housing Demand. The effective demand for housing in Metropolitan San Jose was determined by the number of families entering the housing market and their ability to pay. The San Jose population growth rate of 3.8 percent per year implies an increase of 36,120 persons or 6,567 families between July 1977 and July 1978, the one year period used to estimate housing demand. The income distribution of these new families was assumed to be the same as that observed in a 1974 income survey (Table 13.7, Row 1). This enabled the team to estimate the number of new families in each income bracket in 1977-78 (Table 13.7, Row 2).

It was estimated that ten percent of the units classified as "poor" in the 1973 census could be replaced in 1977-78; these 1,509 replacement houses were allocated to families in the lowest income quartile (fifty percent to the lowest income group, thirty-three percent to the second lowest, and seventeen percent to the third lowest - Row 3). The team also estimated that one half of one percent of the housing stock must be replaced each year due to obsolescence; these 858 units were allocated according to the number of families per income category (Row 4). Generally, a two percent per year obsolescence factor is used; this assumes an average life span of residential structures of fifty years. However, a smaller factor was used for San Jose because it has grown rapidly and most of its housing stock is less than fifty years old. Total housing demand by income group (Row 5) in 1977-1978 was determined by adding Rows 2, 3, and 4.

The team assumed that twenty-five percent of income would be available for housing when incomes were above \$211 per month, twenty percent for incomes between \$140 and \$211, and fifteen percent for families with incomes below \$140. These percentage figures were used to calculate average affordable monthly payments for housing (Row 6). By assuming ten percent interest, ten percent down payment, and a twenty-five year repayment period, average loan amounts and house prices were calculated (Rows 7 and 8). By multiplying number of units needed (Row 5) by average loan amount (Row 8), total housing finance requirements were estimated for each income group (Row 9). It is interesting to note that the credit needed for families with income below \$211, the lowest thirty-nine percent, is only \$9.7 million or less than fourteen percent of the total required housing credit for all income groups.

Though this method of estimating housing demand is objective and based as much as possible on hard data sources, it does have some limitations. The estimates of several factors and some key assumptions were based on intuitive judgments; this is a reasonable approach when data are lacking. In addition, the estimated demand may be conservative because it did not consider the housing demand of the 60,000 families renting housing in San Jose. Despite these minor drawbacks, this analysis is a good example of a rational approach for assessing future housing demand.

DEVELOPMENT INTERVENTIONS BASED ON THE ANALYSIS

The Government of Costa Rica, with assistance from USAID, utilized information from the analysis to design a major urban poverty project for the San Jose Metropolitan Area.² The project, which focuses on tugurio areas, seeks to improve the quality of life of the urban poor by providing greater employment opportunities and improved housing and community services.

The analysis revealed that the majority of tugurio workers were employed in small scale enterprises, therefore, a component of the project was directed to the expansion of this sector. Analysis of small firms indicated several constraints to their expansion: lack of access to institutional credit, poor management, use of inefficient production technologies, and lack of marketing skills and information. The project was designed to overcome these constraints. To improve credit, a small enterprise loan guarantee program was proposed. The technical assistance capacity of the Small Industry and Artisanry Office, Ministry of Econom. would be increased substantially to improve small firm management, production technology and marketing, as well as assist with loan applications. In addition, the project included forty courses for 800 small entrepreneurs in such fields as business management and accounting, production technology, employee relations, and marketing. These activities were designed to increase production in the small scale enterprise sector and therefore to increase the demand for labor.

The project also includes the establishment of three worker owned industrial firms. This experimental approach was a high priority item to the Government of Costa Rica. If the three firms prove successful, additional worker owned firms would be established. Worker owned firms can provide additional jobs as well as improve the participation of lower income groups in the decision making and development processes.

In addition to increasing the demand for labor, the project includes considerable effort to improve the supply of labor. The analysis revealed that numerous job vacancies remained unfilled because applicants were without the necessary job skills. To overcome this situation, the project includes greatly expanded vocational training at the National Vocational Training Institute as well as increased on-the-job training. To improve the functioning of the employment market, the project provides resources for forecasting both job vacancies and training needs. The outreach activities of the Institute for Social Assistance would be expanded to identify better the unemployed and underemployed and to refer them to appropriate programs.

The proliferation of tugurios in San Jose, with their dilapidated housing and substandard infrastructure, has been of increasing concern to the Government of Costa Rica. Information from the housing analysis was used to develop the shelter component of the project. The housing demand analysis revealed a strong desire for home ownership and willingness of low income families to

pay for home ownership. This information in conjunction with construction cost data were used to design a sites and services program within the reach of low income families. The analysis also indicated a demand for home improvement loans; consequently, a home improvement credit program for low income groups was incorporated into the project. Included also is a small program to help squatters or renters gain ownership of the land they occupy.

The project provides technical assistance and loan funds to local community development associations for neighborhood improvements such as water and sewer systems, paving, drainage, lighting, etc. These loans will be repaid by individual beneficiaries through a valorization process. The community infrastructure projects and the proposed housing solutions will provide addition employment to complement the employment component of the project.

The project includes considerable resources for the financing of additional studies intended to enhance the effectiveness of the urban planning process as well as improve content and delivery of assistance to the poor. These studies, which will provide input for policy formation, focus on: (1) the potential impact of employment and housing activities on the migration of rural poor, (2) the degree and nature of urban poverty in areas outside Metropolitan San Jose, (3) the relationship of urban poverty in San Jose to regional development and the growth of secondary cities, and (4) the social and geographical mobility of the urban poor.

The studies, which are an explicit element of the urban poverty project, demonstrate the iterative nature of the relationships between analysis, project design, and project implementation. In this case study, a project idea was formulated which led to the initial analysis of urban poverty in San Jose. This analysis provided the background information needed to design the urban poverty project. The project design called for additional studies and analysis to fill information gaps and to develop future policy and project activities.

NOTES

1. The analyses described are those reported in USAID document: Bruce Herrick and Barclay Hudson, "Urban Assessment of San Jose, Costa Rica: Focus on Poverty," Prepared for U.S. Agency for International Development by Practical Concepts, Inc. (Washington, D.C.: USAID, 1977). Much of the material has been published in book form under the title, Urban Poverty and Economic Development: A Case Study of Costa Rica (New York: St. Martin's, 1981).
2. United States Agency for International Development Mission to Costa Rica, "Urban Employment and Community Improvement," Project Paper (Washington, D.C.: USAID, 1978).

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Comparison of Case Studies

The case studies in Panama and Costa Rica are similar in many respects. The two countries are contiguous small Latin American republics with populations of about two million. They share a common language and culture and are roughly similar with respect to natural resource base, climate, agriculture, industries, and level of economic development. Both have adopted a regional planning process, established high level national planning agencies, and stress the importance of balanced regional development.

The analysis conducted in each country was based on an earlier draft of the framework presented in this book. Both studies represent a collaborative effort involving the national planning agency, other national agencies, and expatriot technical assistance supplied by the U.S. Agency for International Development. Roughly fifty person months of total effort including several months of expatriot technical assistance were utilized for each study.

The case studies are different with respect to geographical scale of analysis. In Panama, a single region was investigated while the Costa Rica analysis focused on a single metropolitan area. This difference influenced the types of questions asked and the choice of techniques.

ANALYSES COMPARED

Analysis of Urban and Regional Policy

In Panama, the analysis was limited to recognition of the fact that the national government was committed to a decentralized regional development strategy. This strategy was reflected in national development plans, the statements of the highest government officials, and the movement of two key ministries out of the Panama City Metropolitan Area. A limited analysis of urban and regional policy in Panama seemed appropriate for two reasons. First, the analysis concentrated on a single region and was therefore only indirectly concerned with national policy. Second, government commitment to decentralized regional development seemed

so strong and definite that it did not seem worthwhile, given time and manpower constraints, to conduct a more detailed analysis.

The analysis of urban and regional policy in Costa Rica provided a little more detail. The focus was poverty in San Jose; consequently, the policy analysis addressed the issue of government commitment to the urban poor. To determine the degree of commitment the study team focused on the national development plan as well as government documents and proposals. With relatively limited effort, the analysis team was able to determine adequately the degree of government commitment to the urban poor.

Poverty Analysis

Relatively detailed poverty line analyses were conducted in the two countries. Intuitive judgment rather than detailed data were used to specify the poverty line of \$150 per capita (1969 dollars) in Panama. Data were available in Costa Rica which enabled the specification of a poverty line based on the market prices of basic human needs. Though the method used in Costa Rica is certainly preferable, the short cut technique used in Panama was acceptable given the time and data constraints of the investigation.

In retrospect, it appears that the short cut method used in Panama would have been suited better for the Costa Rica analysis. By the same token, the market price technique used in Costa Rica would have been more appropriate for the study in Panama which compared the poverty levels of different districts, of urban and rural areas, and between western Panama and Panama City. Because the market prices of basic human needs vary from place to place, comparisons of poverty between areas should be based, if possible, on poverty lines which reflect spatial differences in prices. For instance, the poverty line for Panama City should be higher than that for rural Panama because the cost of living is higher in big cities. By using only one poverty line, the analysis in Panama tended to overestimate rural-urban poverty differences. This problem could have been avoided if area specific poverty lines had been developed. Though time and data were insufficient to implement this approach in Panama, the poverty analysis could have been improved if expert judgment had been used to specify separate poverty lines for the capital city, small cities, market towns, and rural areas.

In Costa Rica, the analysis compared poverty in San Jose between tugurio and nontugurio residents and between migrants and nonmigrants. Because all of these groups were located in San Jose, the prices of basic human needs for each group were relatively equal. In such situations, it is often sufficient to utilize a reasonable, though arbitrary poverty line. However, if good data are available on market prices of basic human needs, they should be utilized; this was the case in Costa Rica.

Poverty is something more than lack of monetary income. Indicators reflecting this dimension of poverty were used in both studies. The Panama poverty indicators approach utilized components analysis; due to its complexity, this approach is not

recommended in most situations. Though the Costa Rica investigation had a more detailed poverty line analysis, it was weaker with respect to analysis of non-income aspects of poverty. The Costa Rican study was oriented toward employment and housing; therefore, poverty indicators related to these two sectors were included. On the other hand, the Costa Rica poverty analysis would have benefited by inclusion of other poverty indicators such as those related to health, education, nutrition, and access to services.

Migration and Urbanization

In each of the studies the analysis of migration and urbanization was tailored to the purposes of the investigation. In Panama, census data on population growth and net immigration were used as criteria for selection of growth and service centers. In Costa Rica the focus was poverty in San Jose and attention was given to rates of immigration, metropolitan population growth, contribution of migration to tugurio population, and differences between migrants and nonmigrants. Though the migration and urbanization analysis in each country was rather limited, it fulfilled the needs of the investigation.

Employment Analysis

The Costa Rica investigation included a comprehensive employment analysis which addressed the informal sector and labor supply and demand. Though some employment data were used in Panama to identify the central place hierarchy, an explicit analysis of employment was not undertaken. This is a potentially serious limitation because the project based on the analysis calls for employment generation through the establishment of industrial sites and training programs. These project activities could have been justified more easily if an analysis had been made of labor supply, demand, and quality in western Panama. Though it is commonly recognized that underemployment is a serious problem in this area, a detailed analysis of the employment situation would have provided valuable background information for project design.

Housing Analysis

Both analyses investigated housing conditions, institutions, and economics. In the Costa Rica study, a comparison was made of housing conditions in all of Costa Rica, in Metropolitan San Jose, and in San Jose tugurios. The analysis enabled the identification of the relative housing need in these different areas. In contrast, the analysis of housing problems in western Panama was more impressionistic. The data presented did not enable a comparison of housing problems or need in the different urban centers or between these centers and Panama City. Inclusion of these data, which were readily available in the 1970 census, would have improved the housing analysis in Panama.

In both countries, an estimate was made of the maximum cost of affordable housing for different income groups. The Costa Rica study was better because it addressed the demand for housing in every income group. In Panama, the number of families in each income group were not specified and no mention was made of housing demand for those above the median income level. In short, the Panama housing economic analysis represents the bare minimum needed for preliminary design of a housing intervention. In contrast, the detailed analysis of housing supply and demand in Costa Rica provides a much better assessment of the economic characteristics of housing. Though the Costa Rica housing economic analysis was comprehensive, it did not require a large amount of data or manpower. Almost all of the data used were available from existing surveys and reports.

CONCLUSION

Each case study provides an illustration of urban and regional analysis in an actual development intervention context. Though the two countries are relatively similar, the focus of each analysis is different. Consequently, different data sources and techniques were utilized. The two investigations were generally quite successful. Hindsight suggests that some issues were studied in perhaps too much detail while others should have been addressed more thoroughly. Such observations are much easier to make in retrospect than before or during an investigation. It must be remembered that the two analyses were conducted under somewhat difficult circumstances and definite time constraints.

The case studies provide some general lessons concerning urban and regional analysis. First, analysis of this type is multisectoral and therefore often requires the cooperation of several government agencies. In many situations international development agencies and/or expatriot consultants also are involved. These different groups have different perceptions and biases concerning priority issues, analytical techniques, and general operating procedures. Such differences are always present and therefore should be recognized and addressed.

Second, new surveys can be expensive and time consuming. In Panama, a wise decision was made to cancel the proposed survey. In Costa Rica, the survey results were not available in time to meet a report deadline; this is not uncommon. Surveys often are overrated; they tend to take longer and cost more than planned. Also, they do not and cannot provide as much data as many believe. The case studies illustrate that a wide variety of data are available from existing sources. The warning about the limitations of surveys is part of a more general rule - namely, attempts should be made to keep analysis as simple as possible. Existing data and simple methods should be used first. If these prove insufficient, then new data collection efforts and more complicated techniques may be considered.