URBAN FUNCTIONS IN RURAL DEVELOPMENT

THE CASE OF THE POTOSI REGION IN BOLIVIA

Project No.
931-0210

Part II: Preliminary Evaluation

by

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United States Agency for International Development
Bureau for Science and Technology
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Regional and Rural Development Division

October 1982

UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT
BUREAU FOR SCIENCE AND TECHNOLOGY
OFFICE OF MULTISECTORAL DEVELOPMENT
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Cover photo: the *jilacata*, or representative, of a rural community arriving in Vitichi after a four hour journey on foot for a weekly meeting with local government officials.

Cover design by Reiko Habe.

USAID Order No. OTR-0000-0-00-2054-01

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INTRODUCTION

Over the past five years, the United States Agency for International Development (USAID) has sponsored a project entitled Urban Functions in Rural Development (UFRD), which was designed to test concepts and methods of planning integrated regional development through pilot applications in three countries. The first of these was carried out in the Bicol River Basin of the Philippines, the second in the Fada N'Gourma and Koudougou regions of Upper Volta, and the third has recently been completed in the Department of Potosi, Bolivia. An integral part of the project has been the preparation of a series of reports and evaluations recording these field applications, with the purpose of ultimately evolving a replicable methodology for integrated development which can be used in other parts of the world.[1]

This volume is the second of two which review the UFRD application in the Potosi region of Bolivia. The first summarises the studies that were made, the methods of analysis that were employed, and the plans, policies, and projects that have resulted or are in the process of emerging. This second volume provides a preliminary evaluation of the project to date, and seeks to derive lessons from the experience by looking in particular at changes that occurred in the regional planning process in Potosi. In light of this, we review the concepts and methods embodied in the UFRD approach, and recommend a number of changes to improve it further. In addition, we discuss some of the conditions and requirements which need to be taken into account by USAID Missions and others concerned with rural and regional development befo - replicating the approach in other regions.

The UFRD Approach to Integrated Development.

There are of course many approaches to planning integrated rural or regional development, but the UFRD approach may be differentiated from others by three characteristics.[2] First, it focuses on the spatial dimensions of the regional economy, rather than as is more often the case on the sectoral dimensions. Second, UFRD avoids the artificial distinction between urban areas and rural areas, and instead treats the two as mutually reinforcing elements of a regional economy. Third, the UFRD approach incorporates a detailed methodology for bridging the gap between concept and action, for translating the notion of integrated development into an investment plan for specific projects.

Conventionally, regional development plans tend to be made up of sectoral components, for example for agriculture, industry and transportation. All too often those engaged in the preparation of plans for one sector are largely unaware of what is being proposed in another. But even where a so-called integrated development project calls for inter-sectoral planning and coordination, it is rare that anything more than a cursory glance is given to the spatial dimensions of the regional economy, its system of settlements, or the location of specific projects. The UFRD approach, on the other hand, takes the spatial dimensions of the regional economy as its starting point, and works towards a development strategy consisting of two key elements: the articulation of the urban-rural settlement system; and the integrated development of functional economic areas based on their productive potential.[3]

The articulation of the urban-rural system involves strengthening the hierarchy of settlements, particularly the smaller towns and villages; improving the linkages between them and their rural hinterlands; and upgrading the distribution of urban-based facilities and infrastructure to aid production and serve the population. The integrated development of selected areas, which are defined through spatial analysis, starts from the principal economic activities of each locality, on the basis of which are designed coordinated project packages to stimulate production, raise rural productivity, and improve access to social services and other amenities.

This concern with the spatial dimensions of the region's economy explains the second distinguishing characteristic of the UFRD approach, the treatment of town and country as mutually reinforcing elements of a regional economy. Empirical evidence in many parts of the world shows clearly that the pattern of development and the incidence of growth is closely related to the relationship between settlements and their hinterlands.[4] The network of cities, towns and villages, and their links to surrounding rural areas, is a key factor in determining how the local economy functions and the manner in which developmental impulses are transmitted across geographical space.

The third distinguishing characteristic of the UFRD approach is its explicit intent to provide those responsible for regional planning with a practical methodology for translating concepts of integrated development into a concrete strategy and investment plan, and for implementing that plan effectively. The

methodology is specifically designed to address critical constraints frequently encountered in planning practice in many developing countries. It stresses the maximum use of existing information, and innovative solutions for overcoming the inevitable problems of data limitations; it emphasises simple and easily understood analytical techniques, which can be applied by staff without specialist training; and it focuses data collection and analysis on the task of facilitating policy-making and project selection. Above all, it aims not so much to produce a particular plan, but to establish an ongoing planning process, capable of generating the information which decision-makers need to make intelligent decisions about investment opportunities. [5]

The Potosi Application.

The UFRD pilot project in the Department of Potosi in south-west Bolivia was carried out by CORDEPO, the regional development corporation for the Department, with the assistance of a resident adviser funded by USAID. Most of the field work and analysis was completed in an eight-month period between August 1980 and March 1981, and since then staff have been preparing a medium term regional development plan, and designing project packages for selected areas. A draft of this plan based largely on the results of the UFRD studies and its approach to integrated area development, was recently completed, and is currently being reviewed by CORDEPO's Board of Directors. A more detailed account of the studies, the analytical techniques, and the contents of these plans, is presented in Part I of this report.

The UFRD project occurred at an opportune moment for CORDEPO, since the Corporation was in the process of transforming itself from a public works agency - mainly concerned with providing urban infrastructure in the City of Potosi - to a regional development agency responsible for planning and coordinating development activities throughout the Department of Potosi. The leadership of the Corporation was thus eager for technical assistance to help them carry out this transformation, and were particularly attentive to new concepts and methods of regional planning.

As the long term resident adviser in Potosi, the author was able to observe at first hand the gradual assimilation of these new ideas by CORDEPO staff, and the parallel process of adapting planning procedures and reorienting development thinking. These observations together with more tangible evidence in the

form of internal memoranda, working papers, published reports and other planning documents, provide the basis for the assessment which follows.

Evaluation Framework.

In evaluating the UFRD project in Potosi, there are three main questions which we would like to be able answer. First, does the UFRD approach lead to better planning, the adoption of more appropriate policies for development, and the more coherent selection of programs and projects? Second, does it lead to improved coordination among the agencies and organisations responsible for development, and hence to more effective implementation of those plans, and the better deployment of scarce resources? And finally does the UFRD strategy of spatially integrated development accomplish its ultimate objective of raising the standards of living of the rural poor?

Since the project was only recently initiated, it is obviously too early to attempt to answer the last question. Several years will be needed before a complete package of projects has been implemented in a given area, and sufficient time has elapsed for potential impacts to take effect. Furthermore, since development plans have only just been published, and measures to carry out specific projects are still at an early stage, it is also premature to attempt to answer the second question concerning the implementation of plans and projects.

This report, therefore, will focus on the first question: does the UFRD approach lead to better planning? As was just mentioned, one of the main goals of the UFRD methodology is not so much to produce a specific plan, but rather to establish an ongoing planning process which yields information and insights conducive to the adoption of more appropriate policies for rural development, and the more coherent selection of projects. In order to answer this question we will examine the impact of the UFRD methodology on the process of regional planning in Potosi, looking in particular at CORDEPO, which is the agency primarily responsible for development activities in the region.

Contents of this Report.

To set the discussion in its proper context, chapter I provides a description of the planning system in Bolivia, and an account of the manner in which regional plans are prepared. At the apex of the planning system stands

CONEPLAN, the National Council for Economic Planning, headed by the Minister of Planning and Coordination, whose Ministry provides the technical inputs necessary for the formulation of national policies and their implementation. As in most countries, line agencies are responsible at the national level for specific sectors such as agriculture, mining, industry, and education, but at the Departmental level the agencies primarily responsible for planning are intended to be the Regional Development Corporations, although this is not always the case.

Paradoxically, although the country has a well defined planning system established by law, in practice the chronic instability of the central government means that no clearly articulated national strategy for regional development has ever been drawn up. In the absence of strong guidance and support from the center, the plans prepared by each of the Corporations tend to adopt a short term perspective, and are often little more than shopping lists of proposed projects. Due to the weakness of technical expertise at the sub-national level, little attention is paid to regional development policy or longer range strategies. Regional plans, when they are prepared, typically include a global or macro-economic component, together with plans for each sector, though rarely any spatial component.

In the second chapter we trace the impact of the UFRD approach on regional development planning in Potosi. To do this, we first describe a model of the planning process which includes four principal elements: (a) data collection; (b) analysis, for defining constraints to development; (c) plan-making, which covers strategy, project identification, and investment budgets; and (d) implementation, monitoring, and ex post evaluation. We then discuss different sequences in which these elements are joined together in practice, and explain the UFRD sequence as distinct from others. Using this model, we describe the impact, or lack of it, of the UFRD approach on each of these elements, illustrating the changes which occurred by referring to planning documents, management practice, and procedures for internal consultation and inter-agency collaboration.

In light of this experience, chapter III reviews the evolution of the UFRD methodology for planning integrated regional development, and proposes further improvements. It should be remembered that the purpose of the three pilot applications of the UFRD approach was to test concepts and methods in the

field in order to develop a practical planning methodology which could be replicated in other regions of the world. Thus the planning methodology, just like the plans that it is intended to generate, should not be regarded as a rigid framework, but rather as a general outline undergoing a continuing process of revision and improvement, to be adapted according to the physical conditions and institutional characteristics of the region in which it is being applied.

Among the more significant changes made to the methodology in Potosi were the introduction of an accessibility model, which can be used to evaluate alternative solutions for improving access to services and facilities, and a considerable expansion of the steps related to plan-making - especially the design of project packages and procedures for improving inter-sectoral coordination and investment budgetting. The chapter concludes with several recommendations for strengthening the methodology further, particularly those which are of critical importance for integrated planning: implementation and inter-agency collaboration.

Following the review of the methodology, chapter IV addresses the issues involved in replicating the UFRD approach elsewhere. It defines the kind of region in which it would be appropriate to adopt such an approach to integrated development planning, and discusses some of the institutionl considerations to be borne in mind before pursuing the idea further. Next, it looks at the scope of work involved, and whether this should include the entire region, and the whole methodology. Then follows an approximate indication of the resources of people and time needed to apply each step of the methodology, and the chapter ends by sketching out the complementary inputs required in the form of technical assistance, funds, and institutional support.

The report concludes with a summary of the main lessons learned in Potosi, and reiterates the principal recommendations for action on the part of USAID. These refer to steps to be taken in Potosi to consolidate progress made so far, measures for further improving the planning methodology, and the requirements for replicating the UFRD approach to integrated development in other regions.

Footnotes to Introduction.

1. For the Bicol case see for example: Center for Policy Studies and Development Studies: *Urban Functions in Rural Development: A Research Project in Spatial Analysis and Planning*. University of the Philippines at Los Banos College, Laguna, 1980. For Upper Volta see: USAID: *Urban Functions in Rural Development: Final Report of a Field demonstration in Fada N'Gourma and Koudougou Regions of Upper Volta 1978-1980*. Washington, USAID, Office of Urban Development, June 1981.

2. See the original report by Dennis A. Rondinelli and Kenneth Ruddle: *Urban Functions in Rural Development: An Analyis of Integrated Spatial Development Policy*. Washington, USAID, Office of Urban Development, 1976.

3. See Part I of this report, chapter 7.

4. See E.A.J.Johnson: *The Organization of Space in Developing Countries*. Harvard University Press, Cambridge, 1970.

5. For a more detailed account of the principles underlying the methdology, see: Dennis A. Rondinelli: "Spatial Analysis for Regional Development: A Case Study in the Bicol River Basin of the Philippines", *Resource Systems Theory and Methodology Technical Papers*, No. 1. Natural Resources Programme, United Nations University, Tokyo, 1980.

CHAPTER I: THE REGIONAL PLANNING SYSTEM IN BOLIVIA

Regional planners in Bolivia are confronted with a frustrating paradox. On paper the country possesses an unusually well defined planning system, yet in practice this machinery has so far proved incapable of formulating a regional plan, still less of implementing one. Established by a series of laws during the mid-1970s, the Bolivian national planning system potentially provides the government with a powerful instrument to guide development in a coherent and rational manner. However, due to a tradition of chronically unstable government from which the country has long suffered, coupled with the attendant rapid turnover of key personnel, there is a serious lack of continuity at the center which obstructs a sustained attempt to evolve and execute an explicit national policy of regional development.

This lack of central guidance means that the initiative for regional planning passes to the Regional Development Corporations. However, these are not supported by effective representation in the central government, with the result that each pursues its own interests, often at the expense of another. Since some have better technical expertise, or stronger political clout, funds tend to be distributed not according to any a priori plan, but according to who is most adept at playing the system. The de facto national policy of regional development which results favors the so-called "central axis" consisting of the three main urban conglomerations around La Paz, Cochabamba, and Santa Cruz, at the expense of other more "peripheral" regions such as Potosi.

The Actors.

As the USAID Mission in La Paz points out, Bolivia was one of the first countries in Latin America to adopt national economic planning, beginning with early attempts following the revolution of 1952.[1] The machinery for the present system was set up under President Banzer during a rare period of political stability in the 1970s. In October 1974 three laws were introduced which established the Ministry of Planning and Coordination (MPC), the National System of Planning, and a National System of Projects, followed by a decree in March 1976 setting up a National Project Committee, and finally in February 1978 a further law formally defining the Regional Development Corporations.[2]

The principal actors in this scenario are CONEPLAN, the National Economic Planning Council, whose task is to determine national policies for economic growth and development; the Ministry of Planning and Coordination, which provides the technical inputs necessary for formulating policies and implementing them; followed by the line agencies or Ministries in charge of each sector, for example agriculture, transporation, health, and education; and finally the regional development corporations which are responsible for planning and coordinating development activities in each of the nine Departments of the country.

A. The National Economic Planning Council. This is headed by the Minister of Planning and Coordination, and includes representatives from the main public bodies concerned with production, such as the Ministries of Agriculture, Industry, Mining and Hydrocarbons. Other Ministers participate in CONEPLAN's deliberations when appropriate, but the formal nominations of the Council reflect an intentional emphasis on economic planning. The Council's task is to translate the national objectives determined by the Council of Ministers into goals and strategies, and to ensure that annual operating plans and longer range development plans prepared by line agencies and departmental corporations conform to these guidelines.

B. The Ministry of Planning and Coordination. This is the technical arm of CONEPLAN, and, as its name implies, is the agency primarily responsible for the preparation of plans and the coordination of activities within the government. The MPC comprises three divisions - for planning, for coordination, and for legal and administrative affairs - each headed by a Sub-Secretary. The largest and most important of these is the division for planning, which in turn has departments for global or macro-economic planning, sectoral planning, regional planning, integration, and project analysis. The staff of these departments are responsible for reviewing the plans prepared by the various Ministries and regional development corporations, and ensuring that proposed activities do not duplicate or conflict with each other. The department of project analysis reviews detailed proposals for individual projects and makes recommendations to the National Projects Committee which includes representatives from organizations concerned with development finance.

The department in charge of regional planning - recently renamed spatial planning - is charged with the responsibility of drawing up a national

strategy for regional development, providing guidelines for the regional development corporations, and assessing the plans prepared by them. Having a regional rather than a sectoral perspective, it has drawn attention to the persistent concentration of resources in a few selected areas of the country, and has constantly argued in favor of a more equitable allocation of funds - so far, however, with little success.

C. The Ministries. Sectoral planning is the responsibility of the various Ministries and other semi-autonomous entities linked to them. Of most importance are those related to productive activities such as agriculture, industry, and above all mining, particularly the state mining commission, COMIBOL. Given the importance of this sector in the national economy, COMIBOL assumes a powerful role and functions almost as an independent fiefdom, largely impervious to outside influence.

With few exceptions, however, most Ministries are weak at planning, and instead tend to concentrate their limited resources of money and trained manpower on solving the widespread problems of administering existing programs. Some thought is given to designing new projects, but relatively little attention is given to more comprehensive longer range planning. There is a tendency to follow conventional models imported from industrialised countries, rather than thinking through more appropriate solutions to match the specific conditions and constraints in Bolivia.

D. The Regional Development Corporations. The other major component of the national planning system is the group of regional development corporations - sometimes referred to as departmental development committees (or DDCs) - there being one for each of the country's nine political sub-divisions or Departments. Most of these corporations were originally set up in the late 1960s or early 1970s as public works committees to provide infrastructure for the capital city of the department, and hence were linked to the central government through the Ministry of Housing and Urban Affairs. With the introduction in 1978 of the law for Regional Development Corporations, their role and functions were broadened, and their responsibilities were defined more explicitly as the social and economic development of the department. To reflect their new status, they were formally incorporated into the national planning system, and are required to prepare annual operating plans and longer range regional development plans for review by the MPC.

The regional corporations are funded from several sources, and the mix varies from case to case. The departments of Potosi, Oruro, and Santa Cruz, obtain most of their income from royalties on the extraction of minerals or petroleum. The Pando receives revenue from a tax on imports to the department, while Cochabamba and the Beni rely mainly on transfers from the national treasury. Funding for all corporations is supplemented by grants from INALPRE, an agency for financing pre-investment studies, and loans and donations from bilateral and international development agencies. Although the corporations have no authority to levy their own taxes, most benefit from revenue derived from a sales tax.

The Planning Sequence.

The planning machinery established under President Banzer was designed to strengthen the central government's ability to steer public agencies towards defined objectives, and to harness their collective resources in attacking specific problems. The planning sequence is intended to start with the Council of Ministers whose role is to identify national objectives for social and economic development. Once defined, it is the task of CONEPLAN, aided by its technical advisers in the Ministry of Planning and Coordination, to translate these objectives into broad goals and policies, which ostensibly provide guidelines and a reference framework for executive agencies. The Ministries, regional development corporations, and other public organisations, are then supposed to prepare medium term plans in light of these guidelines, from which to derive annual operating plans.

Sometime in the fall each year, these operating plans are submitted to the MPC, who make sure that they are broadly compatible with larger goals and policies, and do not duplicate or compete with each other. The MPC, together with the Ministry of Finance, then review the financial aspects of the plans in light of anticipated resources and other needs. Meanwhile, the projects division of the MPC evaluates preliminary feasibility studies for individual projects, and makes recommendations to the National Project Committee. On the basis of these submissions, the MPC finally aggregates individual agency proposals into a single national operating plan, which is submitted to CONEPLAN for their ratification.

The Regional Planning System in Practice.

Needless to say, the tidy rationale of the national planning system is considerably untidier in practice, especially when it comes to regional planning. First, due in part to the widespread shortage of appropriately trained personnel - at the departmental level and at the national level - the system has with few exceptions proved incapable of generating meaningful regional plans or strategies. Second, in the absence of such plans, coordination between Ministries of the central government and the regional development corporations is rare, and where it has been attempted has frequently been undermined by the unpredictable disbursement of funds which makes it difficult for one party or the other to fulfill its obligations. Third, due to the absence of plans and the lack of inter-agency coordination, the ultimate distribution of resources among different regions of the country - one of the key factors affecting growth and development - is subject only to nominal control from the center, being determined mainly by the cumulative decisions of many public bodies acting for the most part independently of one another.

To start with there has been no effective regional planning at the national level. The government of the day occasionally reiterates a commitment to a strategy of "development poles", or alternatively calls for a national policy for rural development, but the motive in both cases would appear to have more to do with securing the political support of key constituencies than with any serious study of the issues. Not that there has been a lack of study - on the contrary considerable effort was expended on the topic in the late 1970s - but that no one really knows what a national strategy for regional development is, or might be, or how it could be implemented. Despite the intentions of the current USAID-sponsored program for rural development planning, the issue has not really been addressed directly, but always skirted around or simply ignored.

Neither has there been much serious regional planning at the departmental level. Despite the MPC's requirement that the regional corporations should prepare longer range development plans as a framework for justifying individual projects in annual operating budgets, few have been prepared, and fewer still have taken account of the spatial dimensions of the local economy. With the exception of the corporations for the departments of Santa Cruz, and more recently Cochabamba, both of which have benefitted from a technical aid mis-

sion from the government of Germany, the MPC and the development corporations have tended to sidestep the planning of regions in favor of identifying and designing projects - an activity which is more tangible, more easily understood, and one in which they have more experience.

None of this is so surprising given the origins of the DDCs as public works agencies focusing mainly on engineering problems, such as highway construction, water supplies, airports and other public buildings. Although they have now broadened their activities to include agriculture and industry, few have yet made the difficult mental transition from construction company to a fully fledged development corporation.

Thus, planning at the regional level is mainly concerned with the preparation of annual plans, which show estimated operating expenses and capital investment needs for new and continuing projects to be funded in the following year. These plans are reviewed by the MPC, and are usually approved with few or no changes, except in the case of projects which duplicate or compete with others elsewhere. Supposedly these budgets form the basis for the Treasury's disbursement of funds to the corporations, although due to the country's perennial economic crises actual payments are usually a lot less. These annual plans, however, tend to be little more than a collection of sectoral proposals, exhibiting perhaps some coherence within a particular sector, but little or no relation to projects in other sectors, and are rarely supported by rigorous feasibility studies.

A second major problem of the regional planning system concerns the lack of coordination between units of the central government and the regional development corporations. True there have been several instances of joint agreements or projects between the two, as for example between CORDEPO and SENAC (National Roads Service), IBTA (Bolivian Institute for Agricultural Technology), and the Ministry of Agriculture. But these tend to be for specific operations, such as shared funding for roads, drinking water systems, electricity generation, and experimental farms. Though these arrangements seem to be mutually satisfactory - or else presumably they would not be continued in subsequent years - it is not uncommon that one party fails to fulfill its part of the contract, due to a lack of funds, manpower, or other resources. Often the root of the problem is once again the delay in disbursing funds, or even outright budget cuts.

On the other hand, examples of concerted planning at the regional level between the central government and the departmental corporations are rare. As the USAID Mission in Bolivia points out: "one of the major defects of the present planning system is that sectoral ministries and regional committees do not consult to any extent in the selection of projects and the development of their respective plans".[3] This is partly because there are few precedents for this kind of joint planning, but also because it is of course far from easy to accomplish. Ministries have their own interests and priorities, which do not necessarily coincide with those of the regional corporations. Apart from the problems of identifying projects of mutual interest, there is also a certain reluctance or inertia to be overcome: agency staff prefer to keep a project in-house rather than to involve others, in order to maintain closer control and to avoid magnifying the risk of a foul-up. But perhaps the single most obvious reason is simply the lack of experience with more complex projects involving collaboration between several agencies in an integrated approach to development.

The lack of coordination between line agencies and the regional corporations means of course that the latter are obstructed from fulfilling their role of chief coordinator with overall responsibility for development activities at the Departmental level. Most corporations are directly responsible for only a small part of total public spending in their region, and when they are unable to participate in decisions concerning investments by other agencies their role is reduced to little more than a spectator. The lack of consultation also means that development efforts tend to be fragmented and piecemeal, sometimes even at cross purposes. Most significantly, the absence of effective machinery for communication and joint planning between the departmental corporation and regional offices of central Ministries represents a major obstacle to be resolved if broader programs of integrated area development are to be attempted.

The void in regional policy at the national level and poor coordination at the departmental level leads to a third weakness in the planning system: the regional distribution of public investment - a key determinant of growth and development - is not given explicit consideration, but is the incidental outcome of decisions made within each agency. In the absence of clearly

defined objectives for regional development, the spatial allocation of resources is determined primarily by institutional and political considerations.

First, sectoral concerns have clearly taken precedence over regional concerns, which means that the regional distribution of investments is ultimately determined as the by-product of decisions made according to sectoral priorities. Although these decisions taken one by one may be quite rational and defensible from the perspective of the agency concerned, taken collectively the outcome in terms of regional distribution is certainly not equitable, and may not even be efficient. By focusing on what are thought to be potentially the most promising activities, Ministries tend to concentrate their activities in a few Departments, largely ignoring others. The Ministry of Agriculture, for example, invests heavily in the fertile areas of Cochabamba, Santa Cruz, and the Beni, while the regional office in Potosi barely has enough to pay its own staff.

Second, there are institutional rigidities to be overcome. Entrenched funding patterns built up as a result of past practice cannot be changed quickly, and ongoing programs cannot be cut easily. Even in the absence of a practising democracy with elected representatives, there are still powerful interest groups pressing for the maintainance or expansion of particular programs, not least the administrators of those programs themselves.

Third, there are always competing needs for scarce public resources. Though the regional corporations may be entitled to certain royalties, taxes, or duties, they do not collect these themselves, but receive them instead from the Treasury or other central government agencies. Given the severe financial crises confronting the central government in recent years, the Treasury has sometimes been forced to meet other priorities, before the corporations receive their entitlements. Thus, in practice it is common for payments to be postponed, in certain cases resulting in a massive backlog of unpaid but ever promised dues.

Finally, whether a corporation receives its payments in a timely fashion or not also depends on the leverage exercised by the corporation among the executive offices of the Presidency, which in turn may depend on the relationship between the incumbent and the president of the regional corporation. Certain regions have traditionally exercised strong political or military

influence in the making or breaking of Presidents, particularly those from the armed forces. Not surprisingly these regions are sometimes able to turn their influence to advantage, not least in the timely payment of transfers. Other regions, without such muscle, have to wait their turn, which always seems to be behind someone else.

Footnotes to chapter I.

1. For a more detailed account of national planning in Bolivia, see USAID: "Bolivian Planning Experience", Annex E of *Bolivia Project Paper: Rural Development Planning*. USAID, Washington, 1978.
2. See "Ley Organica del Ministerio de Planeamiento", and other laws in *Gazeta Oficial de Bolivia*, Ministerio de Planeamiento y Coordinacion, La Paz, 1979.)
3. USAID, op. cit., Annex E, p 5.

CHAPTER II: IMPACT OF THE UFRD APPROACH ON REGIONAL PLANNING IN POTOSI

In this chapter we examine the impact of the Urban Functions approach and methodology on regional planning in the Department of Potosi, by looking in particular at the development corporation, CORDEPO, which is the agency primarily responsible for planning and coordination within the Department. To show this more clearly, we break down the regional planning process into several elements - data collection, analysis, policy-making, project identification, budget preparation, and plan implementation - and explain the sequence in which these elements are sometimes connected, and how they are treated in the UFRD methodology. By looking at each of these elements in turn, we trace how the introduction of the UFRD methodology changed the way things were done in the planning department at CORDEPO, how it affected the practice of interdisciplinary team-work among the Corporation staff, and how it influenced the Corporation's relationships with other public agencies.

Background to Planning in Potosi.

In attempting to evaluate the impact of the UFRD approach on the regional planning process in Potosi, it should be pointed out that USAID's technical assistance program was only one of several factors influencing change at the time. While the UFRD approach certainly provided the conceptual framework for development planning, the introduction of the new laws establishing a national planning system exerted an external stimulus on the Corporation to change direction, and the appointment of key personnel within the Corporation provided the leadership to steer in that direction.

In 1978, in conformance with the new planning laws, the Public Works Committee of Potosi reconstituted itself as CORDEPO, the Regional Development Corporation for the Department of Potosi. The UFRD project, which started towards the end of 1979, thus took place at a time when the Corporation was making the transition from a public works agency providing infrastructure mainly for the City of Potosi to a broader-based development agency whose responsibility extended throughout the entire Department. This transition did not occur overnight, but during the course of three years or more, and may be said to have concluded only recently with the completion of the five year plan, which for the first time formally lays down a policy for regional development.

That this transition has taken so long should cause no surprise, since the reorientation of any sizable institution is bound to be a slow process. It involves not merely changes in personnel, but more importantly the gradual absorption of a new consciousness of purpose, which requires strong leadership with a clear sense of direction, something that was missing at CORDEPO earlier on. However, with the appointment in 1979 of a new corporation President, and a new chief of planning - an economist with experience in the Andean Pact and a clear understanding of the nature of development - the Corporation began to shed the engineering mentality associated with a public works agency, and to replace it with a broader-based mind set focused on social and economic development. This was further reinforced by the replacement in 1980 of the corporation President by a military officer responsive to a professional approach to planning. In this respect, the UFRD project, starting in late 1979, took place at an opportune moment, since the new leadership was receptive to technical assistance that would help the Corporation transform itself into a development-oriented agency.

Elements of the Planning Process.

For the purpose of tracing the impact of the UFRD methodology on the regional planning process in the Department of Potosi, we will break this process down into six main elements, and examine the effect on each one in turn. One of these elements is data collection, including both the use of existing sources, and the design and execution of field surveys to gather information not otherwise available. Another element is analysis, which may be intended to pinpoint key problems, to test hypotheses, or to reach conclusions for guiding future policy. Three other elements relate to the making of plans: these include formulating strategies to attack specified problems, identifying and selecting projects, and drawing up an investment plan or budget indicating the financial resources required, and how these are to be allocated within the region. The final element of the planning process to be discussed here, though one which is often regarded as a separate activity, is the implementation of the plans, programs, and projects, which result from the previous steps.

The six elements described here are not necessarily present in every planning exercise, and are rarely executed in the same sequence. In a conventional scenario, they are often thought of as following one after the other. (See

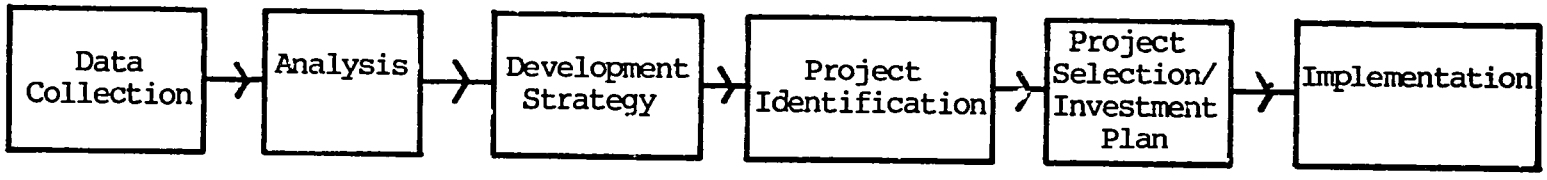
figure 2.1) The process might start with data collection, leading to the identification and analysis of problems, which provide the focus for policy, and hence the context for the selection of programs and projects to be implemented. However, there are problems with this approach. First, without a clear focus for the scope of the analysis, it is not unusual to encounter planning teams falling into the "vacuum-cleaning" trap - devoting enormous time and effort to collecting data of every kind, in the vague belief that more data means better planning, without clarifying the purpose for which the data is needed in the first place. Second, it is common to find many planning teams undertaking extensive but poorly focused analytical studies in the belief that these will somehow lead to the uncovering of "key" insights, which will thus spotlight the strategies to be adopted to solve critical problems. Unfortunately, this method does not always work, as was discovered by the regional development office of the Ministry of Planning and Coordination in the late 1970s, when they undertook a comprehensive study which involved at its peak the efforts of some twenty five technicians. Lacking a clear conceptual framework of the regional growth process, the study eventually floundered into a morass of tables and coefficients, without reaching any conclusions that were useful for formulating a national strategy for regional development.

Another frequently encountered variation of the planning process begins with the selection of some key project, perhaps by a special interest group, a prominent politician, or public official. In this scenario, the purpose of the planning exercise then becomes to justify the decision which has already been made, by arguing the case for an appropriate strategy which points to the need for the project in question. This may require post facto analysis to illustrate the arguments for such a strategy, which in turn may generate demand for particular information or data, although often in such a scenario analysis and data gathering are treated superficially, if at all.

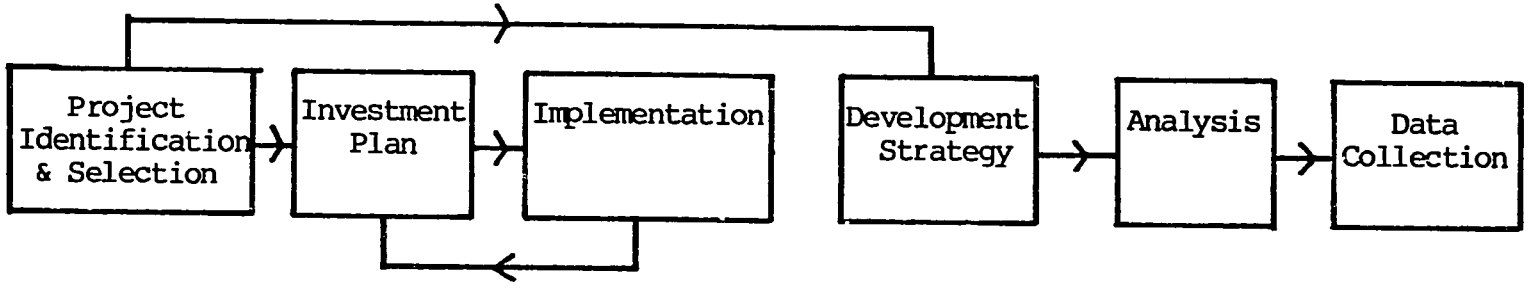
The UFRD approach, on the other hand, starts from a clearly defined concept of spatially integrated development, which is derived from extensive empirical evidence and cumulative planning experience in many parts of the world. (See figure 2.1) In this case the planning sequence begins with the broad outlines of a development strategy, which provide a sharp focus for the ensuing analytical studies, the purpose of which is to test the initial hypotheses and assumptions embodied in the proposed strategy. By providing a clear focus for

FIGURE 2.1: ELEMENTS OF THE PLANNING PROCESS AND ALTERNATIVE SEQUENCES.

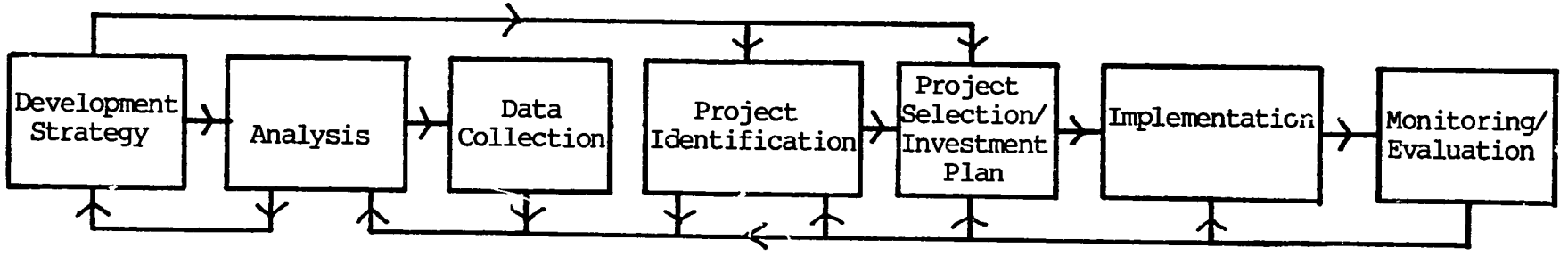
A. Linear Approach



B. Ex post Rationalization



C. UFRD Approach



the analysis at the outset, a lot of unnecessary data-collecting and processing is eliminated, and the analysis can be used at the same time to generate the information needed to adapt and modify the broad outlines of development policy, and to flesh out preliminary details of programs and projects in light of prevailing conditions in the region. A well defined development strategy in turn makes it easier not only for planning staff to identify potential projects, but also for decision-makers to derive clear criteria for evaluating alternative proposals.

Data Collection.

The first element we will look at in tracing the impact of UFRD on the regional planning process in Potosi is the data base for planning purposes and the collection of new information. Two observations may be made about the state of affairs existing at the time the UFRD project began. First, since neither the regional development corporation nor any other organization had previously made a serious attempt to prepare a regional development plan, there was no obvious source of relevant information. Though there existed a fair amount of data on the region, much of it was out of date, unreliable, or incomplete. Most frustrating of all, it was scattered about in numerous offices and agencies not just in Potosi but also in La Paz and several other cities, which made it extremely difficult to track down, and harder still to get hold of. Second, given the conventional perspective of most planning studies focusing on sectoral activities, it was not surprising to discover very little information relating to the spatial dimensions of the regional economy.

As a result of the UFRD project, however, two main things were accomplished in terms of data collection, and a third remains to be completed. First, three field surveys were carried out, designed to yield information for specific analytical studies, policy formulation, and project design. Second, through these surveys there has now been assembled in one place an extensive and up to date bank of information on the spatial dimensions of the Potosino economy. However, it should be stressed that although this data has been assembled, it has not yet been made available in a more accessible form for wider use.

As was mentioned before, the UFRD approach to integrated development stresses the spatial characteristics of the regional economy. Due to the paucity of previous research on the topic, there was very little information that could

be used for the purposes of UFRD analysis. The three field surveys were designed to generate information that would be needed later on for analytical studies used in formulating the details of development strategy, and for outlining project packages for the integrated development of specific areas of the region. The first of these surveys covered over one hundred urban settlements with the purpose of compiling an inventory of services, facilities, and other infrastructure to be found in each place. A second survey included the twenty-five principal markets in the region to determine the area of influence of each one, and the principal form of trade conducted there. A third survey involving two hundred households in urban and rural areas throughout the Department gathered data on travel patterns to a range of urban functions - information that was needed for a study on accessibility. A more detailed description of the design and content of these surveys is given in part I of this report.

As a result of these surveys extensive information has now been collected on the system of settlements in the region and people's use of services and facilities located there. Of particular importance for planners is an inventory of all the services and infrastructure to be found in each town and village of the Department with more than two hundred inhabitants. This inventory covers basic infrastructure such as drinking water, sewerage, and electric power; health and education facilities; offices of local government; the principal economic activities of each locality, including services in support of agriculture and mining; shops and other commercial premises; transportation and communication services; and local organisations. The main characteristics of basic infrastructure and larger establishments such as schools, health centers, markets, and storage facilities, are briefly described, indicating for example the proportion of the community served, the number and type of personnel, and the problems in need of most urgent attention. In addition, information was collected showing the approximate service area of schools, hospitals, and farm support services particularly markets. As part of a study on accessibility, data was gathered showing the relationship between the number of visits and journey times to these services and several other commonly used amenities.

Much of this data was used in subsequent analyses, the results of which are summarised in part I of this report. Quite apart from these studies, the raw

data itself is of considerable potential interest to many other local public agencies, especially health and education authorities and those concerned with agriculture. In many instances the information collected through the UFRD field surveys proved to be more complete, reliable, and certainly more up to date, than that to be found elsewhere.

Since the analysis of data in the UFRD study was done manually without the aid of computers, the raw data has yet to be assembled in a more accessible format for wider use. The original questionnaires from the survey of urban centers, which contain the most valuable information, have subsequently been coded and the data transferred to computer disks, but this task remains to be done for the surveys of markets and households.

The USAID Mission in Bolivia should discuss with CORDEPO the most appropriate solution for making this information available for wider use, and provide them with the means to do this. The most likely alternative is through the local office of the National Institute for Statistics, in collaboration with the computer center at the University of Tomas Frias in Potosi. Apart from the technical process of transferring the data onto computer, funds should also be included for training staff in accessing the material, and for publishing a listing of the available information.

Analysis.

The second element to be examined in this account of the impact of the UFRD methodology on the planning process in Potosi is analysis - a ubiquitous component of planning documents in Latin America known as the "diagnostico". A review of several analytical studies prepared by staff from CORDEPO and other local agencies prior to the UFRD project reveals two traits. First, they lack a focus: though they may be replete with copious data and much description, they possess little interpretation and rarely a meaningful conclusion. This, of course, is not a problem unique to Potosi, but one that results from any study without a clear conceptual framework with which to interpret evidence, and without a clear definition at the outset of the questions to be answered. Second, with the exception of one report commissioned from an outside firm of consultants in the early 1970s, there were no studies looking specifically at the spatial characteristics of the region.

2: Impact on Regional Planning in Potosi

One of the most important innovations in the planning process in Potosi brought about by the UFRD project was the introduction of spatial planning as a complementary component to the more conventional activities of sectoral and global - or macro-economic - planning. While the concept of spatial planning was initially presented to CORDEPO staff and others through seminars and workshops, it was the analysis and interpretation of the data that helped team members to grasp the idea more confidently, and the presentation and publication of the study results that demonstrated the concepts most forcefully to a wider audience.

Specifically, the UFRD analysis set out to examine three main characteristics of the spatial structure of the region: the system of settlements; the linkages between these settlements and their rural hinterlands; and the accessibility of the population to services and facilities located in the urban centers. First of all, the cities, towns, and villages, of the region were classified on the basis of their functional complexity into five categories of urban service center. In this way a hierarchy of settlements was defined, indicating at the top those towns with many functions, some of which - such as a university or an airport - serve the entire region or a large part of it, and at the bottom the villages and hamlets with a few widely distributed functions - for example an elementary school or grocery store - catering to the residents of the immediate vicinity.

Next, the analysis traced out the physical, economic, and service linkages connecting the larger settlements of the Department of Potosi to adjacent regions, and those linking them to their rural hinterlands. By plotting the location of villages surrounding key establishments from which their users or clients came, service areas were sketched out for high schools, hospitals, health centers, and other important facilities including daily and weekly markets.

A third study measured levels of physical access in different zones of the Department to twenty-five commonly used functions and facilities, such as schools, health clinics, local government offices, post ofices, banks, and stores for farm supplies, hardware, and groceries. A comparison of the variation in access levels between zones revealed gaps in the provision of such services, and made it possible to approximate the effective service areas of the establishments located in each of the larger towns.

Based on this analysis of the spatial characteristics of the region, staff identified functional and spatial gaps in the system, and were able to determine which elements of an articulated spatial structure were already in place, and which others needed to be established, strengthened, or repaired. The analysis also served to delineate those areas of the region already functioning as effective economic units, and this information was used to define constituent areas of the region as the basic planning units for the strategy of integrated area development.

The main point to be emphasised here is that the conceptual framework underlying the UFRD planning methodology, based on the spatial dimensions of the regional economy, provided a clear focus with which to define the scope of analysis. Throughout the design and execution of the field surveys and the subsequent analysis and interpretation of data, attention was focused on seeking answers to specific questions which would aid the next steps of shaping a development strategy to fit the particular conditions of the Potosi region, and of designing project packages for each constituent area.

The exercise of carrying out the analysis also provided a valuable learning experience for those directly involved in the work - not least for the chief of planning and the resident adviser - out of which gradually evolved a clearer perception of what future strategy should be. Furthermore, the presentation and discussion of the study results served as a forceful illustration of the concept of spatial planning for other members of the CORDEPO planning staff. Through regular meetings and workshops, staff became more aware of the spatial implications of development, those in charge of sectoral planning recognised better the relationship between their projects and others, and decision-makers started to think more explicitly about the spatial allocation of resources.

Development Policy.

The five year plan recently completed by CORDEPO represents the first explicit statement of a formal policy for the development of the Potosi region. To evaluate the impact of the UFRD approach on development policy, therefore, we have to make a comparison between de facto policies implied by the pattern of capital investments during past years, and the policies explicitly set forth in the five year plan. However, in deducing earlier de facto policies from

the pattern of investments, we have to be careful to distinguish between the annual operating plans, which show how the Corporation intended to spend its money, and actual expenditures indicating how funds were spent in practice.

An analysis of actual investments by sector during the years 1979-1980 shows a strong emphasis on transportation and infrastructure, accounting between them for about 60% of total spending. (See table 2.1) Typical of infrastructure projects are drinking water systems, sewerage, river containment walls, bridges, street paving, the construction of a bus terminal, a stadium, and other public buildings. Spending on the transportation sector for the construction of highways and local feeder roads has invariably been high in Potosi, due to their appalling condition throughout the Department. The figures for 1979 and 1980, however, are substantially higher due to the setting up of an airline company to operate a service between Potosi and La Paz, and the rebuilding of the Potosi airport runway to permit the new aircraft to land in the rainy season.

In terms of the regional distribution of these investments, it is clear that the residents of the City of Potosi were far and away the main beneficiaries. If we include the expenses of setting up the airline, most of whose users come from the city, well over half the total investment was in the departmental capital, or the province of Tomas Frias which surrounds it. Apart from the airline, these investments included upgrading a short stretch of highway connecting the city to a nearby recreation area, street paving, automating the local telephone service, and two agricultural projects - a trout farm and an experimental dairy farm. The spatial distribution of spending within the Department, favoring the City of Potosi, was not so much an explicit choice, but merely the result of continuing past trends and a piecemeal approach to project selection.

In contrast to the earlier situation, there now exists a medium term plan, currently being reviewed by CORDEPO's Board of Directors, which for the first time provides an explicit statement of the Corporation's proposed development policies. The plan includes a global, or macro-economic policy, a spatial policy, and policies for each of the main sectors of the economy, which set the framework for the subsequent selection of individual projects. Of particular interest for the purposes of our discussion here are the global and spatial policies.

TABLE 2.1: CORDEPO INVESTMENTS BY SECTORS 1979 - 1981
(Thousands of Bolivian pesos)

Sector	1979 Planned	1979 %Total	1980 Planned	1980 %Total	1981 Planned	1981 %Total
Agriculture	27821.7	12.54	40321.0	13.28	85163.9	27.03
Industry	21027.8	9.48	32106.0	10.58	40587.3	12.88
Tourism	6391.2	2.88	14296.5	4.71	23549.3	7.47
Mining	13174.1	5.94	24724.8	8.15	16371.2	5.20
Energy	2848.9	1.28	1820.0	.60	16438.7	5.22
Transport & Comm	104794.5	47.24	104801.2	34.53	55583.9	17.64
Urban Infrastructure	12676.9	5.71	25633.8	8.45	19554.9	6.21
Water/drainage	31340.5	14.13	36160.2	11.91	40428.4	12.83
Education	1380.7	.62	4359.2	1.44	6417.0	2.04
Health	390.4	.18	2156.6	.71	3494.1	1.11
Commerce	0	.00	10669.7	3.52	2500.0	.79
Other	0	.00	6487.7	2.14	4986.9	1.58
Total	221846.7	100.00	303536.7	100.00	315075.6	100.00

Source: CORDEPO: *Plan Operativo 1979, Plan Operativo 1980, Plan Operativo 1981.*

The plan advocates a four point global strategy in which agriculture is the cornerstone of development, linked to small complementary industries for processing farm products, and supported by the provision of appropriate productive and social infrastructure. Coupled with this, the strategy proposes an active effort to encourage the concentration of the dispersed rural population in small villages and towns in order to improve their access to necessary services and facilities.

The spatial strategy is based on two key elements: the articulation of the urban-rural system, and the integrated development of component areas of the region based on their productive potential. The first element is designed to strengthen the hierarchy of urban service centers, particularly the small and intermediate-sized settlements; to improve the linkages between them and their surrounding rural areas; and to provide the necessary facilities in each center to support agricultural production and to meet the basic needs of the rural population. The purpose of the second element is to promote the social and economic development of a given area or group of communities as a whole, through a coordinated package of complementary actions to increase production, raise productivity, facilitate marketing, and improve the health and welfare of the inhabitants.

At first sight, there appears to be a wide discrepancy between these policies and the aggregate pattern of proposed investments. In sectoral terms mining absorbs 26% of total spending during the five year period, followed by transportation (22%), and industry (16%) much of which is capital intensive, and only then comes agriculture with 15%. The spatial distribution of funds shows as before a heavy concentration in and around the City of Potosi (34%), followed by two areas with rich mineral deposits, Uyuni (11%) and Nor Lipez (9%). Afterwards come the more rural farming areas that ostensibly are meant to be the focus of development strategy, such as Norte de Potosi, Chayanta, and Tupiza, with about 5% each.

To a large extent the discrepancy is explained once we distinguish between local and national investments. The strategies proposed in the five year plan represent a regional perspective on development, but the aggregate spending includes total investment from all sources, not just CORDEPO but the agencies of the central government as well, whose budgets of course are substantially

larger. The largest items in the budget - for mining, mineral processing, and other heavy industries - reflect national priorities, and swamp the relatively small sums available for regional priorities.

However, once the investments on regional priorities are separated from the rest, four main changes can be discerned which distinguish previous spending patterns from those proposed in the five year plan. First, there is a clear shift from public works projects for urban infrastructure, airports and such-like, to productive activities, most notably agriculture and small agro-industries, such as mills, canning factories, and other food processing plants. In addition several smaller manufacturing projects are proposed for mining centers in the north and south of the Department where there are few alternative opportunities for employment once the existing mineral deposits are exhausted.

Second, there is another pronounced shift from a purely sectoral perspective to a more three dimensional viewpoint in which the spatial dimensions of the region's economy are accorded equal weight. This has had the effect of drawing attention to the geographic location of specific projects, and of introducing the aereal distribution of resources as an important additional factor to be taken into account in the planing of investments. For the first time, the plan demonstrates the allocation of funds not only by sectors, but also by areas.

As a consequence, development policy has adopted an area-based approach, in which the conventional sectoral plans are complemented by plans for the integrated development of functional economic areas. These areas, of which there are seventeen in the region, were defined on the basis of the spatial analysis, and each includes its own hierarchy of proposed urban service centers.

Finally, as an extension of the idea of area-based development, the plan rejects the former practice of producing plans based on a shopping list of largely unrelated individual projects, in favor of a more coordinated approach based on project packages containing elements from several sectors. The starting point for the design of these project packages is the productive potential of the area in question, usually crop growing or stock raising, though sometimes mining related activities. Once these have been identified, the package is framed to include the necessary supporting infrastructure -

irrigation, roads, storage facilities, credit and so on - and supplemented with schools, health clinics and other basic needs, the location of which are all determined in light of the spatial analysis.

Identification, Evaluation and Selection of Projects.

The next element of the planning process to be examined concerns the identification, evaluation, and selection of projects. Identification of a project refers to an unevaluated proposal, about which no decision has yet been made. Evaluation implies criteria for appraising a proposed project in order to compare it with others. Selection involves a decision based partly on evaluation criteria, but also on political factors, institutional interests, and above all financial considerations.

Prior to the introduction of the UFRD approach, the distinction between identifying, evaluating and selecting projects was often blurred. Staff in charge of each sector would draw up lists of proposed projects, but few were evaluated rigorously, and selection was piecemeal, mainly concerned with which ones to include in this year's budget or next. Annual operating plans were little more than a shopping list of these proposals, and not surprisingly exhibited little consistency and less coherence.

Proposals would originate from four main sources: the planning staff of the corporation, its Board of Directors, other public agencies, and community representatives. In the first place, it was the responsibility of the planning staff concerned with each sector to generate ideas for new projects, and as is often the case their proposals tended to reflect their own professional biases. Civil engineers in charge of project management tended to propose large public works, such as an irrigation dam, highway, sports stadium, bus terminal, or airport. Agronomists tended to favor experimental farms, for breeding trout, improved strains of sheep or llamas. Secondly, CORDEPO had entered into a number of cooperative agreements with other public agencies which required continuing financial support from one year to the next. Among these were projects for exploring mineral deposits, and providing roads, drinking water, and electricity in rural areas. Thirdly, despite, or perhaps because of, the absence of a functioning electoral system through which communities could make their voices heard, the President of the Corporation was constantly besieged by community delegations requesting drinking water and sewerage systems, feeder roads, health clinics, and school buildings. These

pleas were usually referred to the staff concerned, and added to the long list of projects to be constructed when funds became available. Finally, proposals might come from the President of the Corporation himself, or members of the Board, and would be passed on to the planning staff to be incorporated into budget plans. Some of the most ambitious proposals originated from this source, absorbing a large part of available funds, as for example the passenger airline, Lineas Aereas Imperiales, launched in 1979 to offer service initially between Potosi and La Paz.

Rarely, however, were these proposals rigorously evaluated. Basic infrastructure of all kinds is needed everywhere; staff in charge of rural roads, sanitation, energy, the building of schools or health clinics, simply added new requests to the long waiting list, and each year included as many client communities as there were funds for. In the case of agriculture, mining, industry, and rural roads financed through a USAID program, more serious efforts were made to evaluate proposals, through feasibility studies using cost-benefit analysis. Sometimes these were dore in house, usually they were sub-contracted to others, but seldom were they satisfactory. There was no standard method of analysis, and results varied widely, depending as much on the people doing the study as the project itself.

The selection of projects for inclusion in the annual operating plan tended to be a fairly straightforward process. Although the plan is intended to serve as the Corporation's budget, and is subject to approval by the Ministry of Planning and Coordination and the Ministry of Finance, perennial national fiscal crises mean in practice that disbursements from the national treasury are only a fraction of what is approved. In effect the budget in the annual plan has to be regarded more as a statement of the Corporation's demand for funds. Lists of projects prepared for each sector were merely aggregated, and the total estimated cost was compared with an approximate budget figure based on the previous year's total plus a suitable increase. Where necessary, the sectoral sub-totals were pruned by eliminating schemes with least support from staff, or preliminary proposals that had not yet been thought out in detail.

The final decision on the selection of projects is taken by the President of the Corporation and its Board of Directors. Members of the Board include ex officio a number of local leaders, such as the Prefect, commander of the

military garrison, and head of the University, as well as invited representatives of certain civic groups, but no professional staff from the Corporation itself. Few Board members would probably claim to have extensive experience of development issues, and tend to take their cue from the President in voting decisions. Since the President works closely with his senior staff in reviewing the more important proposals and recommendations - taking into account his own perception of central government thinking, the concerns of local public officials, business lobbies and other interest groups - there were few dramatic rejections of proposed projects.

The introduction of the UFRD methodology has changed some things but not others. In the first place, the concept of integrated area development provided a clear rationale which made the identification of projects much easier. Using the productive potential of the area as the starting point, and the field surveys and spatial analyses as a reference base, inter-disciplinary teams of planners drawn from agriculture, industry, transportation and other sectors, were able to generate in a short time a package of projects to support agricultural production - such as irrigation, technical assistance, credit, feeder roads, farm supplies, storage and marketing - and to improve the population's access to basic infrastructure and services.

Second, the spatial analysis facilitated and greatly improved the planned location of these facilities. Previously, new feeder roads, schools or health clinics tended to be located where communities requested them, which did not always lead to optimum results. A new health clinic in one village would spur a rash of pleas from neighboring villages, while other areas were left devoid of such amenities. The definition of the settlement system through the spatial analysis provided planners with a clear framework for rationalising the distribution of services and locating new ones among sub-regional, rural, and local urban centers.

Third, the evaluation of proposals improved somewhat, but is still far short of what it might be. By introducing the notion of the area as the focus of development, projects were considered as a coordinated package, and evaluated together rather than separately. Some elements that were difficult to appraise, or appeared unproductive when considered alone, such as feeder roads or storage facilities, thus became more feasible when viewed as part of a larger package. A set of evaluation criteria were suggested for use in comparing

packages of projects for different areas, which included a simplified cost-benefit analysis to represent efficiency considerations, and indicators of development levels and population size to represent equity concerns. Although the cost-benefit analyses of the packages were never done, and the project packages were not explicitly appraised by these criteria, it did advance the principal of treating equity as an equally valid concern alongside economic efficiency.

Fourth, judging by the evidence in the five year plan, the UFRD strategy of area development has been broadly accepted by decision-makers, and is influencing the selection of projects. True, the choice of mining and many industrial projects continues much as before, based on a mix of intelligent guesswork, feasibility studies, and interest from the central government, the private sector or abroad. Typical of these are the geothermal energy project in Sud Lipez, and the mineral processing plants proposed for Uyuni and Nor Lipez. However, in line with global and spatial policies aimed at the development of rural communities based on agriculture, the plan also includes project packages for several areas. Among these are the more backward and isolated areas of the Norte de Potosi (Area I) and Chayanta (III), and others with good agricultural potential such as Betanzos (VI), Vitichi (VIII), Cotagaita (IX) and Tupiza (XI).

By introducing the notion of integrated area development the selection of projects may of course become more difficult, since it is now necessary to meet two sets of objectives and priorities - those for conventional sectoral policies, and in addition those for spatial policy and area based development. Hypothetically, there are two potential sources of conflict. The first arises when an activity that is important for an area, say corn production, is a low priority from the point of view of agricultural planners, who would rather spend the money on producing another crop elsewhere. In the Potosi case, however, this situation seldom arose. The agricultural planners quickly accepted the idea of area based development, in part because it gave their sector a new emphasis and stature in the context of Corporation planning, and hence boosted their claim to a larger share of funding. The second point of conflict arises at the budget margin, between including another individual sectoral project, for example a mineral processing plant, or a package for another area. But again, as is further explained below, the issue never

really materialised in Potosi, since the funding sources for two such activities are distinct, and do not normally impinge on each other. However, if such a direct conflict should ever arise, it ought to be possible to resolve it by reference to the overall priorities of development policy.

Finally, two other important side effects should be recorded, one affecting the way staff worked, the other concerning the internalization of new ideas. Traditionally, those involved in sectoral planning tended to work largely in isolation, knowing little about the schemes of their colleagues in other sectors. Although there had been talk of interdisciplinary teamwork, it was not until staff began the design of project packages for each area that they finally practised it. As a result, coordination between different departments of the Corporation greatly improved, and collaboration with other local public entities engaged in development activities began to expand.

The practice of working together on the design of project packages also provided a most effective learning experience for those involved, and greatly accelerated the process of consolidating the adoption of new concepts and methods within the organization. A series of workshops, seminars, and lectures were presented as a means of introducing the UFRD approach to the staff of the Corporation, but nothing succeeded better than the sessions for designing project packages. Participants became involved in lengthy discussions about concepts of spatially integrated development, and the implications of new policies for their own sphere of responsibility, which sparked a more critical appraisal of existing projects. The cumulative effect of all these discussions was that a larger proportion of the staff became more familiar with new concepts, which slowly began to be internalized into their own work.

Investment Plan or Budget.

As was mentioned before, the budgets included in the annual operating plans tended not to mean a great deal, since the funds actually disbursed to the Corporation invariably fell short of the total approved by the MPC. Nevertheless, they did represent the intentions of the Corporation and would have served as the guiding framework had the funds materialised. Those who prepared them were well aware from past experience that funds would probably not be disbursed in full. However, the exercise was still treated seriously, not least because with MPC approval these budgets could be used as a weapon in

pressuring the Treasury for payment, and as the basis of pleading the Corporation's case with the Presidency.

In the past, the investment plan was prepared by simply aggregating the lists of projects from each sector, which indicated the contributions expected from each source, adding up the total, and pruning (or expanding) judiciously where needed, to arrive at a budget total similar to the previous year plus a suitable increment. The distribution of funds between sectors was not so much the result of a conscious policy decision, as the outcome of summing the needs of each sector. The regional distribution was barely considered at all.

The recently completed five year plan contains in effect two sets of investment estimates. The first shows macro level projections of capital spending required to meet targets for economic growth in line with overall development objectives, and includes investments from all sources, public and private, domestic and foreign. The second refers to estimates of the funds needed from local, national, and international sources for the list of specific projects selected for inclusion in the plan.

At one level, therefore, the remarks made earlier about the effect of the UFRD approach on regional development policy and the selection of projects also hold true for the plan of public investments: namely, that the strategy of spatially integrated development has significantly influenced the planned distribution of capital spending. At another level, however, the UFRD methodolcgy offered little or no guidance on the mechanics of actually producing an investment plan, which essentially involves a series of complicated trade-offs in selecting among the list of identified projects in conformance with global, sectoral, and spatial priorities. One method devised for solving this problem in Potosi is discussed in the next chapter.

Implementation.

It is often suggested that plan implementation is not in fact an integral part of the planning process, but a distinct activity which should be treated separately. This argument is questionable at best, and in the case of the UFRD approach is wholly untenable. Where a development strategy relies so crucially on the concept of integrated development, inter-agency collaboration and coordination is essential. The design of a package of projects must take into acount who is to be responsible for delivering components of that pack-

age, and how these components are to be coordinated in the field. Effective collaboration requires the involvement of participating agencies from the outset of planning, to ensure that staff understand development objectives and policies, and that their own activities are properly integrated into this plan.

The importance of treating implementation as part of the planning process is amply illustrated by the wide gap between CORDEPO's annual operating plans and actual expenditures. (See table 2.2) This may be attributed to several factors, some of which are beyond CORDEPO's control, though others may be responsive to forward thinking and appropriate precautionary measures. First, there is the problem of unpredictable and unreliable disbursement of funds by the national Treasury. This affects not only CORDEPO but also other public agencies who may be unable to fulfill their part of joint agreements for particular projects. When anticipated funds are delayed or even cancelled, the Corporation is forced to retrench on new projects, in order to maintain those already under way, or that are absolutely essential for one reason or another. When partners fail to fulfill their obligations for a project, there is a tendency to drop that project in favor of another which is less dependent on outside support, and under more direct control of the Corporation.

Another cause of the gap between plan and execution is the outcome of negotiations with third parties, especially in the private sector, over joint financing of new projects. Potential partners may postpone decisions, lose interest, or even change their minds after entering into initial agreements, as has happened on some manufacturing schemes. Conversely, though more rarely, new funds may become available sooner than anticipated, as occurred last year with a loan from the River Plate Fund for upgrading the highway from Potosi to Tarapaya. Alternatively, if progress is stalled on one project, it may make sense to accelerate another, as was the case with the rebuilding of the airport runway in 1981. For all these reasons plans may go astray, but precisely because of these eventualities, it is prudent to consider implementation as an integral element of the planning process.

Since the regional development plan has only recently been completed, it is too early to comment on the impact of the UFRD approach on implementation. However, having adopted a strategy of spatially integrated development CORDEPO is now attempting to resolve several ramifications implied by such a strategy.

TABLE 2.2: CORDEPO INVESTMENTS BY SECTORS 1979 - 1981. A COMPARISON BETWEEN PLANNED AND ACTUAL SPENDING
(Thousands of Bolivian pesos)

Sector	1979 Planned A	1979 Executed B	B/A%	1980 Planned C	1980 Executed D	D/C%	1981 Planned E	1981 Executed F	F/E%
Agriculture	27821.7	7546.1	27.12	40321.0	9544.8	23.67	85163.9	12115.7	14.23
Industry	21027.8	565.2	2.69	32106.0	716.6	2.23	40587.3	19673.3	48.47
Tourism	6391.2	981.5	15.36	14296.5	1512.4	10.58	23549.3	2629.5	11.17
Mining	13174.1	2465.2	18.71	24724.8	784.2	3.17	16371.2	1772.1	10.82
Energy	2848.9	2579.2	90.53	1820.0	5064.3	278.26	16438.7	3141.1	19.11
Transp & Comm	104794.5	54620.2	52.12	104801.2	52209.6	49.82	55583.9	8328.9	14.98
Urban Infrastr	12676.9	10148.6	80.06	25633.8	6980.5	27.23	19554.9	6970.7	35.65
Water/drainage	31340.5	20791.7	66.34	36160.2	21974.4	60.77	40428.4	15047.0	37.22
Education	1380.7	984.5	71.30	4359.2	1914.9	43.93	6417.0	2783.8	43.38
Health	390.4	133.1	34.09	2156.6	1152.4	53.44	3494.1	1646.0	47.11
Commerce	0	0		10669.7	0	0.00	2500.0	0	0.00
Other	0	0		6487.7	1247.6	19.23	4986.9	2436.0	48.85
TOTAL	221846.7	100815.3	45.44	303536.7	103101.7	33.97	315075.6	76544.1	24.29

Source: CORDEPO, Annual operating plans for 1979, 1980 and 1981; and unpublished memoranda.

2: Impact on Regional Planning in Potosi

In the first place, as was emphasised before, a strategy of integrated development clearly requires not merely coordination at the planning stage among the departments of the Corporation responsible for sectoral and spatial concerns, but also collaboration at the implementation stage of the many contributing agencies and organizations. Thus, a key factor in the success or failure of implementing the plan is whether or not the various bodies involved can be coaxed, cajoled, or coerced into effective participation.

As a first step towards improving coordination within the Corporation, measures have been proposed for revising its organizational structure. This entails among other things establishing three sections within the planning department, responsible for global (macro-economic), sectoral and spatial planning. This would consolidate the role of spatial planning in the Corporation, according it the same stature as sectoral planning, and would facilitate interdisciplinary teamwork in the design of project packages for component areas of the region. In addition the proposal calls for the setting up of local offices of the Corporation in each of the areas where integrated development projects are under way, which would be staffed by technicians responsible for project execution from the main office in Potosi. This last proposal has apparently met with strong opposition, chiefly from those likely to be assigned to the field offices, who perhaps understandably are reluctant to be posted to small towns in remote locations, far away from the amenities in Potosi, to which they and their families have become accustomed. Partly because of these objections, the proposals for restructuring the organization have been shelved, at least for the time being.

In anticipation of the need to ensure the active collaboration of other government bodies in the execution of the plan, a Departmental Advisory Council has been established composed of representatives from the regional offices of the principal agencies - agriculture, mining, industry, education, health, transportation and communications, and the MPC - together with other relevant local groups. The purpose of this council is both to bring about a common approach to development of the region, and to facilitate the coordination of plans and programs by providing a mechanism for speeding the flow of information between the agencies involved, and expediting joint efforts in planning and financing. This council was originally set up in 1980, but then suspended partly as a result of events in July that year, and partly because it was

thought advisable to wait until work on the development plan was further advanced before initiating detailed and regular consultations.

As a complementary measure, proposals have also been included in the development plan to set up advisory committees for each of the four sub-regions, composed of local representatives of the same or similar organizations, to provide more knowledgeable expertise on each sub-region, and to secure agency collaboration in the field for the execution and monitoring of project packages in specific areas.

Perhaps the most positive and direct indication of the beneficial impact of the UFRD approach on plan implementation, however, is the sudden surge of interest by international aid agencies. Although the Corporation has received assistance from international donors in the past, it has always been hard to obtain for rural development. Due to vigorous efforts by the President of the Corporation, however, negotiations are currently under way with international bodies to fund new projects in four areas of the Department - the Norte de Potosi (Area I), Llica (XV), the plains of Lequesana near Betanzos (VI), and the valley of San Juan de Oro near Tupiza (XI). Although the original starting point for the four projects was quite different, all the agencies involved are interested in some variant of an area-based approach to development. This surge of interest amply demonstrates that the Corporation's proposals are now more in line with mainstream thinking, and thus more attractive to such agencies, a change that in no small way is attributable to the UFRD project. The coincidence of interests and the promise of financial support provides an excellent opportunity and incentive for the Corporation to pursue the strategy of integrated regional development.

CHAPTER III: A REVIEW OF THE METHODOLOGY

The purpose of the pilot projects in the Philippines, Upper Volta, and Bolivia was to test the validity of the UFRD approach to integrated regional development and the utility of the methodology as an instrument for planning. This chapter recounts the evolution of the methodology, reviews it step by step, and suggests further improvements. First, we describe the its evolution from beginnings in the original report by Rondinelli and Ruddle, through the initial framework based on experience from the Bicol project, to the revised version used in Potosi. Next, after clarifying the scope and purpose of the method, we review the Potosi version in more detail, evaluating the innovations and pinpointing shortcomings. In light of this review, the chapter ends with a revised outline, which incorporates a number of proposals for strengthening it further by addressing planning tasks which are not fully covered at present.

Evolution of the Methodology.

The UFRD methodology is designed not so much to produce a specific plan, as to establish a continuing planning process that can generate information useful to decision-makers for appraising alternative development proposals. In the same manner it is useful to think of the methodology itself not so much as a rigid framework, but as one that is evolving in light of experience, and one that users should adapt and modify to fit the particular context in which it is being applied.

The UFRD concept of spatially integrated development was first set down by Dennis Rondinelli and Kenneth Ruddle in 1976 in a comprehensive report for USAID's Office of Urban Development.[1] This report, which reviews the literature on rural development strategies, and the role of small towns in the activities of rural areas, provides an overview of the theoretical background to the UFRD approach, and a comprehensive discussion of the principal inputs required for a policy of integrated rural development. These include national policy and administrative inputs; technical inputs; local support components; and programmatic inputs for project organization and implementation. In addition, the report suggests a number of analytical techniques that are appropriate for spatial analysis.

The outline of a more detailed methodology, designed specifically to aid planners in translating concepts of integrated development into an investment plan for selected projects, evolved during the first application of the UFRD approach in the Bicol river basin in the Philippines. A subsequent report of this project, written by Dennis Rondinelli as a monograph for the United Nations University, lays out an initial version of the methodology as a sequence of eight steps (see table 3.1), and summarises the results of each.[2] In this case, the agency participating in the application of the UFRD approach was not the development authority in charge of planning and implementation, but a university research center which had been hired by the development authority to carry out the spatial analyses and to prepare policy recommendations. Consequently, this first version of the methodology reflects an emphasis on analysis, and did not fully explore the subsequent steps of project selection, investment planning, and implementation.

A second version of the methodology, also written by Dennis Rondinelli at the outset of the project in Potosi, expands the sequence to ten steps.[3] The first six referring to analysis remain essentially the same, but plan-making is now broken down into two steps - formulating an investment framework and identifying projects - while evaluation and the creation of an ongoing planning process are given more emphasis by being treated separately.

During the course of the application in Potosi, the framework was further revised and expanded, and this most recent version has been summarised in a manual prepared for the Ministry of Planning and Coordination and USAID Bolivia.[4] Steps five and six of the earlier versions were collapsed into one - identifying the spatial constraints to development - and the spatial analysis was embellished with the introduction of an accessibility model, which can be used to define service areas for each town, and to evaluate alternative solutions for improving physical access to urban functions. In contrast to the situation in the Bicol, responsibility for the spatial analysis, plan-making and implementation were all assumed by one and the same organisation, CORDEPO. Hence, there was an opportunity to test the methodology one stage further during the preparation of the five year regional development plan. This served to highlight the distinction between sectoral and spatial components of planning, and made it necessary to address the problem of ensuring compatibility between the two at the point of elaborating

TABLE 3.1: OUTLINE OF EVOLUTION OF UFRD METHODOLOGY

Step	Bicol version[a]	August 1980 version[b]	Potosi version[c]
1	Regional resource analysis	Baseline resource analysis	Basic resource analysis
2	Analysis of centrality, functional complexity, and hierarchy of settlements	Spatial systems analysis	Analysis of settlement system
3	Analysis of Linkages	Linkage Analysis	Analysis of linkages
4	Analytical mapping	Analytical mapping	Study of accessibility
5	Delineation of unserved and marginal areas	Delineation of Unintegrated and poorly served areas	Analytical mapping
6	Determination of regional development needs and adequacy of spatial structure	Identification of spatial and functional gaps	Interpretation of existing spatial structure
7	Translation of spatial analysis and development plans into an investment program	Formulation of investment framework	Elaboration of strategy for integrated regional development
8	Creation of monitoring system and institutionalization of planning procedure	Identification of projects	Design and selection of packets of projects
9		Evaluation	Implementation, monitoring and evaluation
10		Creation of a continuing planning process	Creation of a continuing planning process

(a) Dennis A. Rondinelli, "Spatial Analysis for Regional Resource Development: A Case Study of the Philippines", *Resource Systems Theory and Methodology Technical Papers*, No.1, (Natural Resources Programme, United Nations University, Tokyo, 1980).

(b) Dennis A. Rondinelli, "Concepts and Methods of Integrated Regional Development Planning: Linking Urban Centers and Rural Areas in Bolivia", unpublished paper for conference on New Concepts in Regional Development Planning, La Paz, Bolivia, August 1980

(c) Hugh Evans, *Funciones Urbanas en el Desarrollo Rural: Analisis Espacial para Desarrollo Regional Integrado*, USAID Bolivia and Ministry of Planning and Coordination, La Paz, 1981.

strategies, identifying and selecting projects, and preparing an investment plan. However, before the testing of the methodology can properly be said to have been completed, it still remains to follow it through the critical stage of implementation, which requires inter-agency coordination in carrying out the programs and projects generated by the UFRD approach.

A Review of the Methodology.

Before embarking on a review of the Potosi version of the UFRD methodology, it is important to reiterate what it is and is not intended to be. It is intended to be a method for planning integrated regional development, and as such it focuses on the spatial dimensions of the regional economy. This means that data gathering and analysis are oriented to the specific tasks of identifying the spatial constraints and opportunities for development, testing a priori assumptions underlying the strategy of spatially integrated development, and providing the information necessary to elaborate the details of such a strategy, to design project packages for targetted areas, and to prepare investment plans.

On the other hand, the UFRD methodology is not intended to take the place of more conventional sectoral planning, but to complement it by providing a spatial perspective on the region's economy. While the concept of integrated development builds on the spatial coordination of sectoral activities in specific areas, and as such implies a considerable overlap in the content of spatial and sectoral plans, the two are not necessarily mutually inclusive, since programs for integrated development may represent only a subset of total development activity in the region. Nevertheless, the introduction of a spatial focus to development planning alongside a sectoral perspective means that two sets of objectives, priorities, and policies eventually have to be meshed together, and made compatible with one another. This is a complex problem, which surfaced forcefully during the Potosi project. The methods adopted to solve it are summarised below, but it is a topic which would benefit from further study.

For the purposes of reviewing the methodology, we will describe the problems encountered step by step, and explain the measures taken to solve them in Potosi. In this way we will show how the Potosi version of the methodology evolved from earlier versions, and where it needs to be strengthened further.

1. Basic Resource Analysis.

This first step of the methodology is intended to provide a quick preliminary overview of the region based primarily on existing data, to determine what further studies are in order, and what data will be needed to do them. Although the UFRD analyses focus on the spatial dimensions of the region's economy, there are points at which it implicitly relies on inputs from more detailed sectoral studies of agriculture, mining, and industry. This is particularly true for the review of basic resources, which covers soil conditions, patterns of land use and crop cultivation, and the location of water, mineral, and other natural resources. This information is crucial later on for identifying the productive potential of rural areas, as the starting point for the design of project packages for social and economic development, but it is not the kind of information that is readily available in most regions of developing countries.

While some material was available in Potosi, and more is on the way with studies of water resources and land uses, the issue was largely fudged by drawing instead from the cumulative personal knowledge of agricultural planners. While this is not an ideal solution, it may be the only practical way out, short of conducting surveys to gather original data, each of which could easily become a major research effort in its own right. In this respect, the UFRD methodology could provide useful guidance for practitioners by suggesting how this information might be obtained through quick and inexpensive techniques for preliminary surveys of key resources such as soil and water.

Steps 2,3 and 4 - Analyses of Settlements, Linkages, and Accessibility.

The second version of the UFRD methodology written in 1980 included two steps for the analysis of the spatial system, and linkages. The first covered markets, labor force and income characteristics, location quotients, and the settlement system using the scalogram as the instrument for investigation. The analysis of linkages included a range of physical, economic, social, technological, and administrative links between towns and their hinterlands.

In course of the Potosi application, these two steps were redefined, and a new one was introduced. Studies of the labor force and location quotients were transferred to the analysis of basic resources and examined first at the departmental level through an inter-regional comparison, then at the level of provinces within the region. The focus of the next three steps was narrowed

to particular elements of the urban-rural structure. Step two looks at the hierarchy of settlements rather than the entire spatial system; step three deals with linkages more or less as originally proposed, but includes a section devoted specifically to markets, being one of the most crucial links in a predominantly agricultural region; step four introduces a study of accessibility in an attempt to delineate more precisely the service areas of each settlement, and to provide a means for evaluating alternative locations for new facilities and proposals for improving the road network.

2. Analysis of the settlement system.

The principal analytical tool for the analysis of the settlement system is the scalogram, which is described in chapter 3 of part I of this report. This is used to define the hierarchy of settlements in the region, and includes a calculation of centrality indices. In Potosi the scalogram included over one hundred towns and villages, and as many different functions, but even with a smaller version the computations become quite lengthy, especially for the centrality indices, and very tedious when making changes or correcting the inevitable mistakes. Although scalogram analysis can be done by hand, the results tend to be prone to errors, and it is preferable to do it by computer if the facilities are available.

A second comment frequently made about scalogram analysis is that it fails to take account of changes in the settlement system over time. There is no inherent reason why the scalogram cannot be used for this purpose - in fact it would be most valuable to do so - but the problem is usually the lack of detailed data on services and facilities to be found in each place in earlier years which would allow such a comparison to be made. However, in the absence of such data it is important to include some study of the changes taking place among the urban centers of the region. A simple way of doing this - one that was done in Potosi - is to compare the growth or decline of the population of settlements based on census data. (See chapter 3 of Part I.) Over the longer term, of course, the scalogram constructed in the base year will provide an excellent means of comparing changes in the future.

It is also helpful to include at this point a section on threshold analysis, which aims to determine the minimum population required to support a given function, say pharmacy, health clinic, or farm supply store. However, the

method usually suggested for estimating this threshold takes into account only the population of urban centers and ignores people living in surrounding rural areas. In Potosi, and most other regions where the urban population is only a small fraction of the total, this method yields misleading results which are unusable as a guide for planning purposes. Another method, more complicated but more reliable, could be derived from the accessibility model.

Steps 3 and 4. Linkage Analysis and Study of Accessibility.

The analysis of linkages in step three is useful for revealing the strength of association among settlements in the region, and the connections between them and their hinterlands. However, the fact that the residents of one place use the services or facilities located in another place does not necessarily mean that those establishments are providing effective service, especially if a long journey is required to reach them. It may simply mean that there is nothing closer, or that other establishments nearby are not functioning properly, due perhaps to lack of staff, supplies, or equipment.

In order to map out the effective service areas of each town, the Potosi project included a study of accessibility, using a model to measure levels of access to urban-based functions. This model was also used to approximate the area of influence of the larger settlements, and to delineate the constituent functional economic areas of the region. It can also serve to evaluate alternative proposals for improving physical access to urban functions - for example by building new facilities in places without them, or by upgrading roads to existing facilities. Chapter 5 in Part I of this report describes the model and the results of the access study in Potosi, while an appendix to this volume illustrates how it can be used to evaluate alternative schemes for improving access. The model does, however, involve extensive manipulation of data, which can be done by hand, but really needs to be done by computer if its potential is to be fully utilised.

5. Analytical Mapping.

Although analytical mapping appears in the methodology as a separate step, it is of course an integral part of each of the previous studies. In Potosi, a major problem arose in trying to obtain an accurate road map, a problem which had still not been satisfactorily solved even after months of effort. The most detailed and accurate maps were prepared by the Military Geographical Institute, but the ones of the Potosi region were at least ten years out of

date. Another series of maps from the National Statistics Institute indicated census divisions for relating data to areas, but the location of roads and even place names was often inaccurate. Since this problem is probably far from unique to Bolivia, it would be helpful to include in the methodology a section dealing with these difficulties, and exploring the potential of aerial or satellite photo resources.

6. Existing Spatial Structure.

Steps five and six of earlier versions of the methodology deal with the delineation of unintegrated and poorly served areas, and the identification of spatial and functional gaps. In practice, it is difficult to separate the two issues, since areas are unintegrated or poorly served due to the absence of roads and urban service centers, or the lack of functions in existing settlements. For this reason, the Potosi study collapsed the two steps into one, interpreting the existing spatial structure. At this point the access model proved most useful in delineating existing functional economic areas. On reflection, however, it might be more appropriate, and more helpful in providing a sharper focus, to refer to this step as the identification of spatial constraints and opportunities for development.

Steps 7 and 8. Strategies and Projects.

Steps 7 and 8 of the 1980 version of the method referred to the formulation of an investment framework and the identification of projects. These steps of the Potosi version deal essentially with the same tasks, but circumstances there highlighted a crucial problem which dominated these stages of the planning process. First, as has been mentioned before, CORDEPO's planning department was organised by sectors - agriculture, mining, industry, transport, and suchlike - and the UFRD studies of the spatial dimensions of the regional economy were treated as a complementary activity. Second, the UFRD project coincided with an ambitious attempt by the Corporation to prepare a comprehensive medium term development plan, which emphasised regional objectives and priorities, but which also incorporated national programs and projects. Third, as a result of the UFRD studies, it was decided to adopt a strategy of spatially integrated development based on component areas of the region. These three factors highlighted the crucial importance of meshing together two sets of objectives, priorities, and policies from sectoral and spatial analyses, and ensuring inter-sectoral coordination within each area.

7. Elaboration of Strategy for Integrated Regional Development.

Strategy, of course, is largely predetermined with the UFRD approach to spatially integrated development. Given the primary objective of raising standards of living of the rural poor, the strategy of integrated development takes agriculture as the mainstay of economic activity, linked to the creation of new agro-industries to generate employment opportunities in urban areas. It stresses further the articulation of the spatial system - building up the system of settlements and their linkages to hinterlands - and implies the notion of area-based development, or the area as the unit of development planning rather than the sector.

Essentially, then, this step is concerned with laying out a framework for the subsequent identification and selection of projects. The Potosi version interpreted this as putting the flesh on the bones of a strategy of integrated regional development in light of the previous spatial analyses. Among other things, it involved verifying the initial assumptions of the approach, and spelling out the implications of a development policy based on the spatial articulation of the urban-rural settlement system, and support of agriculture and related industries. But most crucially it also involved ensuring compatibility between spatial and sectoral policies.

8. Design and Selection of Projects.

This step of the methodology really covers three distinct activities: the initial identification of projects, and the preliminary design of project packages; then the evaluation of these projects and packages according to criteria of efficiency and equity; and finally the selection of projects with the simultaneous preparation of an investment plan.

(a) Project Identification. The 1980 version of the methodology referred to the identification of projects in terms of project packages for settlements within the region. In part, this was a reflection of the experience in the Bicol study, which concluded with recommendations for sets of services, facilities and infrastructure to be provided at each of three levels of urban service centers. In Potosi, as a consequence of the spatial analyses, the Corporation adopted a development strategy based on functional economic areas, using the productive potential of the locality as the cornerstone for identifying projects and designing integrated packages.

(b) Project evaluation. Experience from Potosi also suggests that, in order to provide better input into the final selection process, the methodology should place greater emphasis on the ex-ante evaluation of projects. In the past, decisions tended to be made mainly in response to such factors as the availability of outside financial support, the interests of the professional staff, and pleas from business groups, public officials, and community delegations. In contrast, studies evaluating the efficiency or equity impact of projects have played a relatively minor role. The problem is not that decision-makers ignore these considerations, but that they have scant information to guide them: formal evaluation studies are rare, and usually unreliable.

The need for ex-ante evaluation methods is evident not only at the global level of deciding between major programs, but also at the more detailed level of designing project packages. These tend to include all the most obvious inputs, such as irrigation, storage facilities, credit, extension services, and distribution centers for farm supplies, but little thought has been given as to which of these inputs are more effective than others. At some point staff need to know, for example, whether a marginal dollar is better spent on a tractor, credit, or extension agents.

The choice of evaluation techniques is by no means obvious. Ways of answering the last question were being investigated in Chuquisaca and Oruro by other members of the Rural Development Planning Project, but preliminary results suggest it is not easy.[5] In Potosi, simple methods were suggested for taking into account equity considerations, but these were not applied due in part to the termination of technical assistance.

Cost-benefit analysis has of course become a highly sophisticated instrument, although in day to day operations in the field, it has serious drawbacks as a planning tool. The detailed data required for such an analysis are often hard to find, and staff are rarely well versed in the techniques, which leads to such a diversity of assumptions and methods that it is almost impossible to compare two projects in any meaningful way. Technically, of course, it is possible to include all kinds of refinements to allow for equity considerations, target group priorities, regional preferences and suchlike. However, as the calculations become more complicated, the probability of error increases, and the variation in estimates of the final costs and benefits

grows wider. At the same time, lay people find it harder to follow the reasoning, and decision-makers lose confidence in the results.

In short, it is doubtful that cost-benefit analysis by itself is very useful for the purpose of helping planners and decision-makers to choose between one project and another. It may be more helpful to trade off technical sophistication and spurious accuracy for cruder, but simpler, criteria and methods that are easy to apply and understand. In this respect, the project identification stage of the UFRD methodology could be greatly improved by devoting more attention to ex ante evaluation. Particular attention should be paid to alternative indicators of efficiency and equity, and simple techniques for helping staff prepare better studies yielding more reliable information that decision-makers can depend on, and that negotiators can use in discussions with other development agencies.

(c) Project Selection and Investment Planning. In Potosi, the design and selection of project packages for each of the seventeen areas of the region proved to be the mechanism that effectively took care of most of the problems of reconciling spatial and sectoral plans. This was accomplished by the participation at one point or another of virtually the entire staff of the planning department, including not only those responsible for spatial studies, but also those from each sector. First they were involved in shaping the components of each package, ordering the sequence of activities, and estimating costs, and later they took part in the lengthy and complex process of selecting projects and simultaneously preparing investment plans.

The procedure evolved for tackling this problem consisted essentially of an iterative process of working alternately from the bottom up, based on the aggregation of estimated project costs, and from the top down based on global priorities for the sectoral and spatial distribution of resources.[6] The key to mastering the difficulties of keeping so many variables in mind was the use of a large three-dimensional matrix representing investments by years, by projects grouped according to sectors, and by areal planning units - delineated on the basis of the spatial analysis - grouped according to subregions. The process began by recording on the matrix all proposals from sectoral and spatial planning teams, indicating the costs and expected funding sources of each project in each area in each year. The total spending required in each sector and area was calculated, and a second version of the

matrix was then produced, reflecting global priorities and anticipated financial resources. This version was presented to the entire planning staff for their comments and criticisms, and returned for a second iteration. The process of exchange and compromise was continued until a position was reached that was mutually acceptable to department heads, and to the President of the Corporation and his planning chiefs.

Steps 9 and 10: Implementation, Monitoring and Evaluation; and Creation of a Continuing Planning Process.

The last two steps of the methodology are concerned with the implementation of the projects and programs previously selected, and the creation of an ongoing planning process. Although these issues received extensive attention in the original report by Rondinelli and Ruddle[7], subsequent versions of the methodology have not dealt with them in much detail. To some extent this reflects the lack of experience gained so far from field applications of the methodology at this stage of the planning process. Now that the regional development plan has been completed, an excellent opportunity presents itself for learning more by following up on subsequent events in Potosi. USAID's Regional and Rural Development Division, who have inherited the UFRD project from the now dissolved Office of Urban Development, should ensure that efforts are made through periodic visits to monitor the implementation of the plan during the next few years.

The relative lack of emphasis given to implementation in the methodology may have to do with the definition of purpose, or the end product that is expected from planning. This is not peculiar to the UFRD approach, but is endemic to planning, and demonstrates the importance of clearly establishing at the outset what the purpose of the planning exercise is to be. Sometimes the task concludes almost before it has begun, with the collection of extensive data - often dressed up as establishing a "data bank". Frequently, it ends with the completion of an exhaustive analysis, which may include broad recommendations for policy and a few more specific actions. Occasionally, it results in a plan, loud cheers, and after the initial enthusiasm, all too often quiet oblivion. Things might perhaps turn out differently, however, if the end product of planning were defined not as a plan, but a plan implemented.

The implications of such a definition are that planning does not stop with the completion of a plan, or even a series of periodically updated plans, but

continues right through the implementation of projects, to include subsequent monitoring and feed-back. The UFRD methodology recognises this, in as much as steps are included for ex-post evaluation, and the creation of a continuing planning process, but the ramifications are not followed through to their logical conclusion. If the end product is to be a plan implemented, then the methodology should include steps specifically oriented to figuring out how the plan is to be implemented.

Implementation of a strategy for integrated regional development implies coordination between agencies in the provision of component inputs during the course of carrying out project packages. Monitoring involves following the progress of projects and programs to spot potential difficulties, to find ways of averting them or solving them, and to facilitate the timely completion of each activity. Evaluation procedures are needed to measure the extent to which programs and projects are contributing to longer term development objectives. All of these tasks require the close collaboration of numerous organizations at the local, regional, and national levels, and such collaboration itself demands careful planning.

In Potosi, collaboration between CORDEPO and other agencies was largely informal and somewhat piecemeal. To a great extent the regional development plan was prepared without much direct input from other organizations, the attitude being that it would be better to prepare a plan first before inviting comments and criticisms. It is too early to say yet, but experience elsewhere suggests that other agencies may feel less committed to such a plan, since they were not closely involved in its preparation.

Effective implementation of a plan requires coordination with other agencies not just at the point when projects have to be carried out, but earlier during the design and selection of project packages, and the preparation of investment plans. In many cases collaboration may be appropriate right from the outset, during data collection and analysis. The regular discussion and exchange of ideas among staff from different agencies can provide the catalyst for generating a common approach to thinking about development among participating organisations, and for fostering mutual support and commitment to the venture. This being the case, planners need to think about implementation, not after completion of a plan, but right from the start - in fact, without exaggeration, almost before anything else.

A closer examination of the mechanisms required to facilitate the effective implementation of programs and projects, which in turn points to the need for close collaboration between the principal actors involved in regional development, implies in practice what amounts to no less than the creation of a continuing planning process. It would seem appropriate, therefore, to recast and expand the methodology at this point to address in a more explicit manner the institutional aspects of planning integrated regional development.

Recommendations for Strengthening the Methodology.

With these comments in mind, we conclude with a number of recommendations for strengthening the UFRD methodology. These proposals, which are summarised in a revised framework shown in table 3.2, are intended to address those elements of the planning process which are not explicitly treated in earlier outlines. The revised framework introduces a new section on data collection, reduces tne number of steps devoted primarily to analysis, separates project design and selection into two parts, and recasts the sections devoted to implementation and creation of a continuing planning process.

In both the 1980 and the Potosi versions of the methodology, six of the ten steps are devoted primarily to analysis of existing conditions, while all other tasks of the planning process are covered in only four steps. To a certain extent, this emphasis probably reflects the abundance of literature on methods of spatial analysis relative to the paucity of experience at the plan-making and implementation stages. Important as analysis is, there is a danger that by placing so much apparent emphasis on it, those using the methodology may fall into the trap of spending too much time dwelling on the niceties of analysis at the expense of rushing through the less familiar tasks of identifying and selecting projects, allocating investments, and coordinating activities for program implementation. In retrospect, this tended to happen in Potosi, and slowed progress towards project design and investment planning.

With this in mind, it is first proposed that the six steps of earlier versions concerned primarily with analysis should be regrouped and collapsed into four. The analyses of basic resources and the settlement system remain much as before, but the analysis of linkages and the study of accessibility are combined since they are closely related. The two sections of the 1980 version related to the delineation of unintegrated and poorly served areas, and the

identification of spatial and functional gaps, are treated as one step as in the Potosi version, while map-making, which was previously treated separately, is here regarded as an integral part of other tasks.

Next, it is proposed that a new section be included to cover data collection. One of the principles on which the UFRD method is based is to minimise the need for gathering new data by using as much existing material as possible. This is a noble intention, since so many planning studies fall into the trap of devoting unnecessary time and energy to collecting volumes of data which are largely irrelevant for the purposes at hand. However, the kind of information needed for the UFRD spatial analysis - for example, an inventory of services and infrastructure to be found in each village and town - is likely to be available in very few regions of most developing countries. Thus, in practice it is almost inevitable that any application of the UFRD approach will require at the outset a fairly extensive field survey covering, for example, urban centers and markets. In this respect the methodology should provide practitioners with guidance on methods of designing surveys and collecting data for spatial analyses.

A third proposal is to separate project identification and selection into two steps. The first should concern itself with the initial identification of projects, the preliminary design of project packages, and an ex ante evaluation to allow projects and packages to be ranked according to selected criteria representing both efficiency and equity considerations. The second part should deal with the complex issues of project selection and investment planning.

Both these steps, together with the previous one devoted to elaborating a strategy for integrated regional development, should also address the reconciliation of spatial and sectoral plans. In developing countries, sectoral planning is usually the norm and spatial planning is likely to be introduced as a parallel activity. Whatever the case, the UFRD approach to regional planning is not intended to replace conventional sectoral planning activities, but to complement them. The inevitable inconsistencies between spatial and sectoral proposals will come to the surface during the preparation of investment budgets, if not before. If development activities are to be integrated effectively. means must be found to reconcile the differences. This is a complicated topic, and the methodology needs to offer guidance to ensure that

spatial and sectoral plans are not only compatible with each other, but mutually reinforcing.

A fourth proposal is to recast and expand the later steps of the methodology related to implementation and the creation of a continuing planning process. To address the issues more explicitly, it is suggested they be treated under four headings: a preliminary review of public agencies and other organizations involved in the social and economic development of the region; a framework outlining their potential role in the planning process not just at the implementation stage, but throughout all the planning tasks; methods for monitoring the implementation of projects, and evaluating them later; and actions needed to institutionalize the practice of integrated regional planning within local organizations.

The review of agencies involved in development activities should include public institutions, non-governmental bodies, and prominent regional groups from the private sector. It should seek to provide a brief description of their resources of information and skilled manpower, links to national Ministries or other arms of the central government, sources of funding, responsibilities, and scope of activities.

The next step should lead to a plan showing how each agency and organization might appropriately be drawn into the planning process, be it for data gathering, analysis, project design, project selection, investment planning, implementation, monitoring or evaluation. The plan should also take into account the participation of community groups, not necessarily at the macro level of region-wide planning, but at the later stage of more detailed planning for selected areas.

Another section of the methodology should provide guidance on setting up mechanisms for monitoring the execution of projects, to ensure the timely and satisfactory provision of inputs from participating institutions. It should also include methods for the ex post evaluation of projects, to determine their contribution to the original objectives of raising the standards of living of the rural poor.

A final section should consider actions needed to ensure that participating organizations develop their own capacity to practice integrated regional

planning after outside technical assistance is terminated. This ought to include measures for establishing a permanent unit responsible for spatial planning; training the staff of this unit; setting up a reliable system for storing and accessing data on the spatial characteristics of the region obtained through field surveys and other sources; and exploring the potential use of micro-computers for selected tasks such as scalogram analysis, modelling accessibility, evaluating projects, and preparing investment plans.

As a final comme , it is important to emphasise that the order in which the steps of the methodology are listed in the outline should not be interpreted as necessarily being the order in which they are performed. In practice many of these tasks will be going on simultaneously, and each provides inputs for others. What is more important to bear in mind is the relationship of one element of the methodology to others as outlined in figure 2.1. Thus, the overall strategy of integrated regional development shapes the scope of the analyses to be made, which in turn determines the need for data and field surveys. At the other end of the cycle, the monitoring and evaluation of projects feed back into the tasks of coordination, investment planning, and project design.

TABLE 3.2: PROPOSAL FOR REVISED OUTLINE OF UFRD METHODOLOGY FOR PLANNING INTEGRATED REGIONAL DEVELOPMENT

Step	Description of activities	Topics to cover in methodology
Data needs and field surveys	Includes inventory of data required based on analyses to be made; review of existing data sources to locate suitable material, and identification of missing information to be culled from field surveys; design of surveys and questionnaires; field surveys; data processing.	Methods for collecting typical information needed for UFRD analyses, eg surveys of urban centers, marketplaces, key agricultural supply or processing facilities; survey techniques; sampling methods; questionnaire design; computer processing of data.
Basic resource analysis	A preliminary overview based primarily on existing data and information, focusing on social, economic, and demographic characteristics of the region, epecially agriculture. Where detailed sector studies are not available, should include simple surveys of key resources to identify productive potentials.	Potential sources of information on natural resources, especially those relating to agriculture; quick and inexpensive techniques for surveying water resources and soil conditions.
Analysis of settlements	As existing, highlighting the distribution of urban functions in cities, towns, and villages, but with revised methods of threshold analysis.	Explanation of scalogram analysis, centrality indices, ranking criteria, threshold analysis, and suggestions for time series studies given limited data.
Analysis of linkages/ study of accessibility	As existing, focussing on linkages between settlements and their rural hinterlands, access to urban-based functions, and the effective service areas of major facilities and urban centers.	Sources of information on linkages; techniques for measuring strength of association between places; explanation of access model and potential uses.
Spatial constraints and opportunities for development	Combines the two steps of earlier versions dealing with delineation of unintegrated and poorly served areas, and the identification of spatial and functional gaps. Focuses on identifying spatial constraints and opportunities for development.	Explanation of use of access model for delineating functional economic areas.

TABLE 3.2: (continued)

Step	Description of activities	Topics to cover in methodology
Elaboration of policy for integrated regional development	Test validity of a priori assumptions about a strategy of integrated area development, and modify policy in light of local conditions, checking compatibility with sectoral and global plans if any. Spell out elements of strategy, defining functional economic areas of the region, and hierarchy of central places to serve as urban service centers.	Explanation of elements of a policy of spatially integrated development.
Design and evaluation of project packages	Design of project packages for component areas, based on productive potentials identified earlier; simple ex ante evaluation of project packages based on available data; ranking according to weighted criteria.	Procedures for inter-departmental and inter-agency collaboration in design of project packages; suggestions for criteria and simple techniques for ex ante evaluation.
Project selection and investment plan	Preparation of investment plan; and simultaneous selection of projects; ensuring compatibility between spatial, sectoral, and global objectives, policies, and projects.	Procedures for planning investments, and reconciling spatial and sectoral proposals, for example as described in text through successive iterations starting from bottom-up estimates of project costs, matched against top-down global targets for distribution of investments.

TABLE 3.2: (continued)

Step	Description of activities	Topics to cover in the methodology
Analysis of institutions	Includes preliminary survey of public agencies involved in regional development, covering resources of skilled manpower, funds, relevant programs, previous involvement, performance in joint efforts.	Outline information needed and alternative ways of acquiring it.
Collaboration coordination and participation	Framework for inter-agency collaboration and coordination at each stage of the planning process; specifying type of contractual agreements, contribution of funds, manpower and other resources; mechanisms for community participation.	Review of alternative contractual arrangements for inter-agency collaboration in data pooling, research, project design, implementation, monitoring, and evaluation. Forms of community participation.
Monitoring and evaluation	Procedures and responsibilities for monitoring progress on project implementation, and ex post evaluation of implemented projects.	Methods of monitoring for effective feedback into design of subsequent activities; methods of ex post evaluation.
Institutional measures	Includes personnel training, staff assignment and organization; and use of computers for data banking, scalogram analysis, access modelling, and investment planning.	Development of software programs to facilitate application of UFRD methodology.

Footnotes to chapter III.

1. Dennis A. Rondinelli and Kenneth Ruddle: *Urban Functions in Rural Development: An Analysis of Integrated Development Policy*. USAID, Washington, 1976.

2. Dennis A. Rondinelli: "Spatial Analysis for Regional Resource Development: A Case Study of the Philippines", *Resource Systems Theory and Methodology Technical Papers*, No.1. Natural Resources Programme, United Nations University, Tokyo, 1980.

3. Dennis A. Rondinelli: "Concepts and Methods of Integrated Regional Development Planning: Linking Urban Centers and Rural Areas in Bolivia", unpublished paper for conference on New Concepts in Regional Development Planning, La Paz, 1980.

4. Hugh Evans, *Funciones Urbanas en el Desarrollo Rural: Analisis Espacial para Desarrollo Regional Integrado*, USAID Bolivia and Ministry of Planning and Coordination, La Paz, 1981.

5. Enrique Gomez d'Angelo: *Perfil Estadistico*. USAID and the Ministry for Planning and Coordination, La Paz, 1981.

6. The procedure is explained in more detail in an unpublished manual prepared by Hugh Evans for the staff of CORDEPO, entitled "Paquetes de Proyectos para Areas: Metodos de Elaboracion". CORDEPO, Potosi, 1981.

7. See Dennis A. Rondinelli and Kenneth Ruddle, op. cit., especially chapters 3 and 5.

CHAPTER IV: REPLICATION OF THE UFRD APPROACH IN OTHER REGIONS

This chapter discusses the factors that need to be taken into account by USAID Missions and others when considering the replication of the UFRD approach to integrated development in other regions. First, we define the context in which it would be appropriate to use the UFRD approach by referring to the purpose for which it was designed. Second, we discuss two issues concerning the institutional framework for planning integrated regional development: the locus of the spatial planning team, and the role of UFRD studies as an instrument for changing perceptions about regional policy. Third, we consider the scope of work involved, and whether this needs to include the entire region, and the whole of the methodology. Next, we look at the resources of staff and time required for each step of the methodology, using the Potosi case as a guide. Finally, we draw attention to the need for complementary inputs in the form of technical assistance, funding, and institutional support.

Context.

In the first place, when and where is it appropriate to use the UFRD approach? The methodology is designed as a means for planning spatially integrated regional development. At one level it can be used for the narrow purpose of coordinating project packages for rural development within targetted areas, but at another level it can also be used to resolve the larger ramifications of a policy of integrated development, requiring the spatial coordination of sectoral activities throughout the region. As was stressed before, the methodology does not replace sectoral or global planning, but is intended to complement them by addressing the spatial dimensions of the regional economy. At the same time, the methodology does not culminate in the detailed design of specific projects, but provides a first approximation of the contents and costs of project packages for selected areas, the location and timing of package components, and the inputs required from participating agencies.

The kind of region in which the UFRD approach can be applied is closely related to the assumptions implicit in the strategy for integrated development and the planning methodology. In brief, it is assumed that the region in question is at an early but not inchoate stage of economic development, and has a sizable population that is engaged primarily in agriculture, living chiefly in small towns, villages, and rural areas. At the same time, the

analytical framework, which focuses on the characteristics of the urban-rural system, is designed for a region which has entered at least the initial stages of urbanization and spatial articulation.

The UFRD approach is most applicable, therefore, in developing regions where agriculture is the main activity, where there is a sizable population living chiefly in rural areas, and at least the beginnings of a recognizable system of settlements. It is also appropriate in more developed regions, where the urban system is further advanced but not yet fully articulated, in which links between the main towns and rural hinterlands are still weak. However, it is largely irrelevant in areas with little or no population, and in regions that are totally undeveloped or still at the earliest stages of spatial articulation with few settlements of any size and no real linkages between them. Neither is it suitable for regions with a migratory population, where settlements are impermanent or seasonal. As regions become more developed, more urbanised, and better articulated, the UFRD approach becomes more complex and eventually less relevant.

Institutional framework.

The UFRD methodology aims not to produce a regional development plan, nor even a series of such plans - important though these are - but to create an ongoing planning process capable of generating useful information which can help decision-makers at both the local and national levels to evolve a more coherent and better coordinated approach to the development of the region. Initially, many decision-makers may not be familiar enough with the concept of spatially integrated development to fully understand the policy implications, or to recognize the need for setting up a continuing planning process. In practice, therefore, the initial task of a UFRD planning exercise is usually to educate, to introduce new concepts and ideas, and to present them in such a way that they gradually win acceptance, and are eventually reflected in development thinking. In such a situation, the utility of UFRD concepts have to be proven in the day to day solution of planning problems, before the approach is likely to be adopted by decision-makers on a broader level. In this respect, it is important that the UFRD study should not be treated as something self-contained and separate from mainstream planning activities in the region, but integrated closely into ongoing tasks, and designed to yield useful inputs into current planning decisions.

This is best accomplished by a sustained effort to train a small cadre of spatial planners who can act as advocates and interpreters of the new ideas among their colleagues. Ideally, this team ought to be in a position where its members can follow through the application from the initial field surveys and analyses, to the elaboration of policy, the design of project packages, up to the preparation of investment budgets, and beyond to the subsequent monitoring, feedback, and revision of plans. To foster continuity and to minimise the very real risks of losing direction through the fragmentation of tasks, it is strongly recommended that any UFRD-inspired spatial study should not be sub-contracted to outside consultants or research institutes, but undertaken in-house by the staff of an organization with the capability to implement programs, projects, and other actions that are proposed as a result. The obvious candidate, if it exists, is the regional development agency; otherwise, an organization that plays a prominent role in the planning of the region, and has the potential to organise broad collaboration with other public and private bodies.

Scope of work.

In presenting the UFRD methodology to audiences in Bolivia, questions repeatedly arose concerning the scope of work to be undertaken. First, people wanted to know if it was necessary to include the entire region - in this case the department - or if the approach could be applied in only part of it. To answer this question, we should distinguish between the initial stages of data collection and analysis, and the later stage of plan-making and implementation, which incorporates the two-pronged strategy based on the articulation of the urban-rural system, and the integrated development of selected areas of the region.

At the implementation stage, it is almost inevitable that programs for integrated development will cover only part of the entire region at any given time, for the very simple reason that there are unlikely to be sufficient financial resources to include more. This implies starting with those areas having the highest priority, or if preferred a subset of areas broadly identified at the outset.

On the other hand, the spatial dimensions of the region's economy cannot be satisfactorily analyzed without treating it in its entirety. The picture that

emerges in one locality is inevitably affected by what is happening in adjacent localities. Without reference to the region as a whole, its constituent areas cannot be delineated on the basis of functional economic units, and settlements cannot be classified according to the hierarchy of central places. Without a larger view, it is also difficult to specify actions at the broader level of the sub-region, or subset of areas, for articulating the urban-rural system. Of course, plans can be prepared on the basis of a partial analysis, but the selection of towns and villages to perform the role of rural and local centers dictates the subsequent location of new feeder roads, services and facilities. Faulty conclusions based on incomplete analysis could lead to costly long term mistakes.

The operative word here is "region", which is not necessarily synonymous with the political unit of department, state, or province. For administrative reasons it is often expedient for planning purposes to regard the region as synonymous with the political unit, but in Bolivia, for example, most departments include extensive areas that are virtually undeveloped and unpopulated. Unless they are strategically important or have a direct bearing on plans elsewhere in the department, there is no particular point in including these areas in a UFRD spatial analysis, since there are no towns and few people living there. On the other hand there may be areas beyond the political boundary which exert a strong influence on peripheral communities within the department, and these ought if possible to be included.

It might be argued that this is begging the question, since the delineation of the region will only emerge as a result of the UFRD spatial analysis. This is of course true, although usually those with experience of development planning will already have a fairly good idea of what constitutes their region, and the UFRD studies can be used to test this hypothesis. Thus, in short, the spatial analysis, and hence the accompanying field surveys, ought to encompass all of what is presumed to be the effective region, defined as a functional economic unit, and ideally those areas immediately adjacent which exert a significant influence within it.

People also asked if it was necessary to apply the methodology in its entirety, or whether satisfactory results could be obtained by using only parts of it. One way to answer that question is to think of the methodology as one set of analytical techniques to provide information for generating plans, inclu-

ding the design of strategies for integrated development, and project packages for particular areas. As before, plans can be produced with little or no information, but better plans ought to result from better information. The whole point of the spatial analysis, for example, is to yield insights on aspects of the regional economy that have largely been ignored in the past. Thus, the need for information on specific issues of integrated development should determine which parts of the methodology can usefully be applied, which in turn will depend on what material already exists, and on the nature of the region itself.

The initial data collection and spatial analyses, once completed, can serve as a valuable information base for several years to come, since the spatial characteristics of a region change slowly. Revisions, or embellishments of the original analyses, might be prepared periodically, but field surveys to update the inventory of infrastructure and services in each settlement would probably not be needed for five or six years. On the other hand, the making and revising of plans, together with their implementation, would of course be a continuing activity, just as with global and sectoral planning.

Resources.

It is important to stress that spatial planning requires an investment of people, time, and money, commensurate with global or sectoral planning. It should not be thought of as a one-off study that can be quickly finished and forgotten, but as an ongoing process that requires a commitment of resources appropriate for the task. It is an activity that has a direct bearing on virtually the entire range of development projects, and as such should be thought of as a necessary and productive investment which can potentially yield significant benefits in terms of more effective coordination between sectors, and more efficient allocation of the scarce resources available.

Given the complexity of the topic, and the special skills required to carry it out, it is strongly recommended that a permanent full-time team be set up exclusively concerned with spatial planning. The size and composition of this team depends partly on the characteristics of the region, and partly on the capabilities and accomplishments of those engaged in other aspects of planning in the region. Given the peculiarities of planning practice in each organization, it is difficult to set down precise guidelines for universal applica-

tion. However, some general comments on the composition of the team are in order, and an indication of the number of people needed is given below by comparison with the case in Potosi.

Since regional planners are in scarce supply in most developing countries, it is almost inevitable that existing staff members will have to be trained in the new concepts and methods of spatially integrated development. This can be turned to an advantage since existing skills become less critical. Ideally a mix of professions is desirable, selected from among economists, geographers, sociologists, political scientists, agricultural economists, transportation engineers, agronomists, architects and urbanists. While all team members need to be instructed in the methods and techniques, it is essential that efforts are made to ensure that the team leader grasps the broad conceptual outlines of the approach sufficiently well to be able to fit the parts together as a whole. Ideally, team members should be familiar with all aspects of the methodology, and all parts of the region, such that they can take each other's place when necessary. However, some specialization in analytical techniques and particular sub-regions is also desirable to build up training skills and more detailed knowledge of each locality. It is inadvisable to give the main responsibility for spatial planning to staff temporarily assigned from other duties, although it will probably be necessary to recruit additional assistance at particular phases of the work, especially during field surveys.

As an indication of the number of people needed to carry out each step of the planning process, figures are given for the case of Potosi. (See table 4.1.) By way of comparison, it should be noted that the Department of Potosi covers 118,000 square kilometers, has a population of some 650,000, and contains over one hundred settlements with more than two hundred inhabitants, all of which were included in the survey of urban centers. Like most other regional development corporations in Bolivia, CORDEPO has a small team in charge of global planning, and several groups engaged in planning for agriculture, mining, industry, and other key sectors.

Soon after the UFRD project was started in Potosi, the director of planning assigned four people to work full time on the study, and a fifth - his deputy - to act as manager when necessary. Eventually, after long term technical assistance ended, the deputy chief came to assume the role of team leader. To assist with the field surveys, four students were hired from the local univer-

TABLE 4.1: PEOPLE AND TIME REQUIRED FOR STEPS OF UFRD METHODOLOGY
(Based on application in the Department of Potosi.)

Element	Tasks involved	People	Months
Data needs and field survey	review existing data sources; identify data needs;	4	1
	design survey; test; revise.	2	1
	Form survey team, train; field test.	9	0.5
	Execute survey of 110 settlements, 25 markets, and 200 households.	9	1.5
Basic Resource Analysis	Review of physical, economic and demographic indicators, comparing region with others, and constituent provinces of region; based mainly on existing data.	4	2
Analysis of Settlements	Processing data from surveys;	2	1
	Analysis of scalogram and other data; Report writing.	1	1
Analysis of Linkages	Processing of data;	4	0.5
	Analysis and report writing.	1	1
Study of Accessibility	(a) Analysis of travel patterns.		
	Processing data from household survey;	2	1
	Analysis and report writing.	1	1
	(b) Access model.		
	Preparation of base data and maps;	4	0.5
	Computation of access indices;	4	1.5
	Interpretation and report writing.	1	1
Analytical Mapping	Locate, obtain, and review existing maps;	1	1
	Prepare and revise two versions of over 25 maps drawn at different scales.	1 (+1	5 2)
Existing Spatial Structure	Report interpreting previous analyses and identifying chief spatial constraints to development.	1	1
Policy-Making	Ensuring compatibility between spatial and global policies; writing report detailing spatial policy.	1	1
Design of Project Packages	Interdisciplinary teamwork involving most planning staff; resulting in matrix showing projects by sectors, areas, and years; approximate costs; participating agencies.	4 (+ all staff)	1.5
	(Estimated effort for each package.	1 (+ all staff)	0.4)
Project Evaluation	Approx. ex ante evaluation of project packages based on criteria for efficiency and equity. (Estimated effort for each package.)	1	0.5
Investment Plan	Selection of projects and preparation of investment plan in line with global, sectoral, and spatial priorities.	2 (+ all staff)	2
Institutional Analysis	Review of institutions participating in development activities as initial step to implementation plan. (Estimate.)	2	2

sity. Since the project had fallen way behind schedule, and since the original team members were temporarily diverted to other duties at a critical moment in the project, the four assistants were kept on for a further six months to help with data processing and analysis. In addition, a full time draftsman was needed for six months to prepare an extensive series of maps - an essential component of the work. Once the project had been more or less brought back on schedule with the completion of the initial reports on the spatial analysis in time for a workshop in the spring of 1981, the assistants were released, followed a month later by the draftsman. The permanent members of the team have since been working more or less full time on the plan-making stages involving the elaboration of strategy and the design of project packages, which were included in the recently completed five year regional development plan.

Support.

Given the complexities of introducing new concepts and methods of planning, the host organization will need complementary support from outside sources in three vital areas: technical assistance, financial assistance, and perhaps most important of all institutional support from the central government.

A. Technical assistance. Even with the aid of detailed manuals explaining the methodology, and with trained regional planners already on hand - an unlikely eventuality - the implementing agency will need technical assistance. Long term technical supervision has to be provided to launch the project initially, to design a scope of work in light of the existing planning capabilities of the agency and the characteristics of the region, from which to determine the resources needed, and to monitor the project closely during the first year or two to ensure that it stays on track. The long term adviser must be someone with experience of regional development, and closely familiar with concepts of spatial and regional analysis.

Additional short term technical assistance may be required for specific tasks, such as the design of field surveys, data processing and computer programming, or the institutional analysis and framework for inter-agency collboration. At the implementation stage additional assistance may be needed for the design and evaluation of projects. However, short term advising is best kept to a minimum, both to avoid an unnecessary expansion of work, and to encourage the host agency to be as self-sufficient as possible.

Another component of technical assistance refers to training of personnel. This should not be restricted merely to instruction in the techniques of regional analysis necessary for the UFRD studies, but should also include a serious effort to put across the broader concepts of spatial planning, such that at least the leader of the team becomes sufficiently conversant with the approach to initiate studies and proposals after long term assistance has been discontinued. It is not that hard to teach people analytical techniques: a much more difficult proposition is to educate a leader who can take the initiative in fighting for new proposals, and in pushing the adoption of new ideas.

B. Financial assistance. To help those agencies who decide to replicate the UFRD approach with the initial costs of training and field studies, it may be appropriate to offer them financial assistance. However, apart from the costs of training and technical assistance, it is preferable that projects be designed in such a way that agencies can afford to pay most if not all of the expenses involved themselves. Otherwise, if they come to rely too much on outside funds for staffing or studies, they will not easily be weaned to the stage of supporting their own spatial planning activities in the long run.

Ideally, national planning ministries, USAID Missions, or other international aid organisations, which are interested in encouraging the replication of the UFRD approach to integrated development, should seek to provide funding for the implementation of project packages which result. This is of course the topic for another discussion, but if spatially integrated planning is to be adopted on a wider scale, attention also needs to be paid to making available larger financial resources for area-based development.

C. Institutional support. Efforts to foster the adoption of new approaches to planning integrated regional development will surely fail, unless host agencies receive firm support from the central government. It is important to bear in mind that we are talking here not of a project with a short duration, but of a planning approach to rural development that will need many years to carry out. It is not enough to provide technical and financial support merely for the initial stage of plan-making: help has to be sustained through the critical period of implementation, with repeated demonstrations of interest and concrete support over several years, until the process has become firmly established and institutionalized within the agency concerned.

In this respect, an important role can be played by USAID Missions, and especially by the central government ministry or department primarily responsible for regional planning and development. USAID Missions can help to keep the process on track by carrying out periodic reviews to monitor progress and make recommendations where appropriate. More importantly, there has to be support from a higher level institution in the central government to back up the regional body should conflict arise, either from staff within the agency itself, or from local offices of central ministries, who might not cooperate in supplying funds, personnel, equipment or other inputs. The backing of a higher level institution is also vital for providing leverage when it comes to approving budgets and plans, seeking cooperation from other central Ministries, or negotiating with international bodies.

CONCLUSION AND RECOMMENDATIONS

To end this report, we will summarise the main conclusions reached in the course of this preliminary review of the application of the Urban Functions approach to integrated development in the Department of Potosi, and reiterate the principal recommendations for action on the part of USAID. These cover proposals for consolidating the progress made to date in Potosi; for revising the planning methodology; and for replicating the approach in other regions. But first, let us recapitulate the lessons to be drawn from the Potosi experience.

Lessons from Potosi.

Looking at the impact of the UFRD methodology on planning practice within the regional development corporation, CORDEPO, four changes stand out above others. First, there has been a clear shift of emphasis from public works projects - the heritage of the Corporation's earlier days as an agency for building infrastructure in the City of Potosi - to productive activities, most notably agriculture and industry. Second, there has been a radical reorientation in the way the Corporation thinks about planning, away from a purely sectoral perspective, dealing with agriculture, mining, transportation and urban infrastructure as largely independent activities, to a more three-dimensional view, which incorporates the spatial dimensions of the regional economy. As a logical consequence of this, the development policy set forth in the five year plan starts with agriculture as the cornerstone of development, coupled with agro-related industries, and adopts an area-based approach, in which conventional sectoral plans are complemented by plans for the integrated development of functional economic areas. Finally, as a corollary of the area-based approach, the former practice of producing annual operating plans composed largely of unrelated projects has been rejected in favor of coordinated project packages for selected areas.

It is still too early, however, to judge if the plans will be implemented as intended. Due to the precarious nature of the Bolivan economy, not to mention the perennial and debilitating political instability of the central government, the Corporation faces grave impediments, not least in the tardy and unpredictable disbursement of funds. Nevertheless, there are hopeful signs: international development agencies have expressed an interest in taking part

in four area-based projects, which would be a first for Potosi. This sudden proliferation of active interest from outside bodies demonstrates more clearly than anything else that the Corporation's thinking is now closer to current international trends, and their proposals are more attractive to prospective aid donors.

Judging by the response among decision-makers in Potosi, as reflected by the contents of the five year plan, we can confidently conclude that the UFRD approach provides a constructive framework for thinking about regional development, and has proven its utility as a planning tool. As the President of CORDEPO has put it:

> "The results of this experience have convinced us that it is a practical instrument, and appropriate for the use of regional development corporations, such as ours. The methodology has helped us to a great extent to evolve a more coherent and unified approach in the preparation of our regional development plan."[1]

Nevertheless, there is considerable scope for improving the methodology further. Where the Bicol pilot project helped to shape the analytical stages of the method, the Potosi application, by going one stage further, helped to reshape and sharpen the tasks devoted to plan-making. Still lacking, however, is field experience of the most crucial stage of all: the implementation of plans, programs, and projects. In this respect, the Potosi application offers an excellent opportunity to monitor progress and to elaborate this aspect further. Meanwhile, considerable work remains to be done in revising the outline of the methodology to strengthen those aspects of the planning process not explicitly addressed at present, and to produce a detailed manual for use by practitioners in the field.

Recommendations.

This review of the Potosi experience points to a number of recommendations for actions to be taken by the USAID Mission in La Paz, other Missions interested in adopting the UFRD approach, and the Regional and Rural Development Division of USAID (R2D2) in Washington, which has inherited the UFRD project from the now dissolved Office of Urban Development. These may be summarised under three headings: steps to consolidate the advances achieved in Potosi; actions to be taken for improving the methodology; and measures to consider before replicating the approach in other regions.

A. Actions in Potosi.

In Potosi, two urgent and unfinished tasks need to be wrapped up, both of them involving the transfer of material to computer.

1. The USAID Mission in Bolivia should provide funds to put onto computer in Potosi valuable data collected during the UFRD field survey of over one hundred towns and villages. This is necessary to avoid the very real risk of losing it, and more purposefully to make it accessible to other planning agencies in the Department. Not only is much of the material more accurate, up to date, and complete than that existing elsewhere, but it also represents the foundations of a data bank, providing an irreplaceable baseline against which to measure subsequent growth and change in evaluating the long term effects of a policy of spatially integrated development. This data, along with a full size version of the scalogram constructed from it, has already been processed on computer, and is currently stored on three 8" floppy disks. It merely remains to translate it into a format that can be read by the university computer in Potosi, to train personnel in accessing this data, and to prepare and circulate a listing of the available material.

2. The USAID Mission should also provide funds to complete the final steps needed to set up the accessibility model on computer in Potosi. Without this final step, it will not be possible for CORDEPO to use it as originally intended, to provide a method for evaluating alternative proposals for improving access among the rural population to urban-based services and facilities. The model, which was designed during the course of the Potosi study, represents an innovative solution to the difficult problems of determining the optimum choice of feeder roads and location of new services, and has widespread potential application for regional planning. An example of the use of the model for evaluation purposes is included in the appendix to this report. Again, a computer program for the model has already been written and is fully operational. All that has to be done is to set it up at the computer center of the university in Potosi, to write a more comprehensive manual, and to train CORDEPO staff and others how to use it.

3. The Mission should further maintain a program of regular visits to CORDEPO, to help ensure that the original objectives of the rural development planning program are successfully achieved: namely, that the new planning methods become firmly established within the Corporation. Continuing support for

CORDEPO is crucial to help them maintain course in pursuing the policy of integrated regional development, as evolved through the UFRD project and now embodied in their regional development plan, particularly during the difficult period of implementation. The Mission should work together with the Ministry of Planning and Coordination, and others where appropriate, not only to ensure that the new planning methods are successfully internalised, but also to facilitate the implementation of programs and projects for area-based development.

B. Improvements to the Methodology.

4. USAID's Regional and Rural Development Division should continue monitoring progress in Potosi during the implementation of the regional development plan in order to provide feedback for the further improvement of the UFRD methodology. So far, the UFRD approach has really only been tested as far as the making of plans, and still needs more thorough assessment at the most critical stage of execution. The next few years in Potosi provides an unmatched opportunity to follow a UFRD-inspired policy of spatially integrated development from conception through to implementation.

5. USAID's R2D2, through its collaborative agreement with Clark University, should continue work on the further improvement of the UFRD methodology to incorporate the lessons learnt from the pilot applications in the Philippines, Upper Volta, Bolivia, and elsewhere. The experience in Potosi suggests that the earlier emphasis on analysis should be redressed in favor of plan-making and especially implementation. The revised twelve step framework proposed in chapter III starts with a new section on data collection; reduces the steps concerned primarily with analysis from six to four, sharpening the focus on spatial constraints to development; consolidates plan-making into three steps for policy, project design, and investment planning; and reshapes and expands the latter sections to address the creation of a continuing planning process, paying particular attention to inter-agency collaboration to facilitate the implementation of programs and projects. This last includes a review of local institutions involved in the development process; a framework for coordination and collaboration spelling out the role of each agency and channels for community participation; the monitoring of programs and projects during implementation, and the evaluation of them afterwards; and a final section devoted to developing institutional capabilities for integrated regional planning.

6. USAID's R2D2, again through the agreement with Clark, should pursue the preparation of a detailed manual providing step by step guidance for field practitioners in applying the UFRD planning methodology. Considerable material already exists for such a manual: a sixty page summary in Spanish was prepared for a workshop in La Paz in September 1981[2], and a series of more detailed manuals for seven of the ten steps of the Potosi version of the methodology have already been published or drafted[3]. In addition, the senior author of the original UFRD report is at present revising his earlier work on the subject. It remains to bring all this material together and, in light of the collective experience in the field, to produce a comprehensive manual to aid planners in applying the methods and concepts.

C. Replication of the Methodology.

The UFRD methodology is by no means the only way to go about regional planning, but it is one of the few examples of a framework for planning spatially integrated development, and perhaps the most comprehensive of them. If applied properly, it has proved itself to be an effective tool in orienting development thinking and for generating more coherent plans. The methodoloy can be used in the narrow sense of coordinating sectoral activities for rural development in targetted areas, but it is also a powerful instrument for integrating development efforts at the level of the region. However:

7. When replicating the UFRD approach in other regions, USAID Missions should be prepared to make a long term commitment to providing and maintaining support to host agencies. We are talking here not of a specific project with a short term lifespan, but an ongoing effort to introduce and establish new methods of regional planning. Not only does this require technical assistance to instruct personnel in analytical techniques, but a longer term follow through to help ensure that the methods become firmly incorporated into local planning practice, and are translated into plans, programs, and projects that are implemented.

8. USAID Missions should also ensure that funds for technical assistance in applying the UFRD methodology are coupled with financial resources for integrated regional development. It is important to stress that the planning process should not end with the production of a plan, but the implementation of programs and projects. While it is not suggested that USAID Missions

should become the sole or even the principal source of investment finance, they should make serious efforts to ensure that either they themselves or agencies of the host government earmark resources for area-based programs and projects that arise from the application of the UFRD approach.

The longer term.

To conclude this review, it is as well to remind ourselves of the ultimate objectives of the UFRD approach to spatially integrated development: namely, to improve the welfare of the rural poor in developing regions. The application of the methodology in pilot projects in several countries has clearly demonstrated its utility as an instrument for planning. Nevertheless, important though it is to improve the regional planning capabilities of development agencies, the ultimate test of the validity of the UFRD approach is the extent to which it contributes to raising the standards of living of the rural poor. It will be several years before UFRD-inspired plans and projects have been implemented and had time to achieve an impact. Thanks to the staff of CORDEPO, an excellent start has been made in the Department of Potosi. The USAID Mission in Bolivia, and the Regional and Rural Development Division in Washington, should continue collaborating with their partners in CORDEPO to nurture their offspring to full maturity. Only then will we know whether the Urban Functions approach to integrated development fulfills the promise it holds.

Footnotes to Conclusion.

1. CORDEPO: *Funciones Urbanas en el Desarrollo Rural: Resultados del Estudio en Potosi.* Volume I. CORDEPO, Potosi, 1981. Prologue, p i.

2. Hugh Evans: *Funciones Urbanas en el Desarrollo Rural: Analisis Espacial para Desarrollo Regional Integrado.* USAID Bolivia and Ministerio de Planeamiento y Coordinacion, La Paz, 1981.

3. These manuals were written primarily for a Bolivian audience, but the material is relevant for more general application. The tasks covered by these manuals include: (i) Field Surveys; (ii) Basic Analysis of Resources; (iii) Analysis of the Settlement System; (iv) Analysis of Linkages; (v) The Accessibility Model; (vi) Interpretation of the Existing Spatial Structure; and (vii) Design and Selection of Project Packages for Areas.

APPENDIX: USE OF THE ACCESSIBILITY MODEL FOR EVALUATING PROPOSALS

Among the innovations to the UFRD methodology introduced in the Potosi application was an accessibility model. One purpose of this model was to delineate the functional economic units of the region, based on effective service areas of larger urban centers, by measuring levels of access in different zones to a range of urban-based services and facilities. The procedure for doing this is explained in chapter 5 of Part I of this report. The same model may also be used to evaluate alternative locations for new facilities, and proposals for improving the road network. However, due to the lengthy computations involved, which in Potosi were done by hand, it was never applied there in this way. Since then, a computer program has been written for the model, and this appendix provides an example, based on an area in the north of Potosi, of how it may be used as a tool for ex ante evaluation.

Measures of accessibility.

The original version of the model, as explained in chapter 5, measures levels of access for the population of each zone to urban services and facilities. However, the model can be turned inside out by measuring levels of access in a given place to the surrounding population, in effect a simple measure of market potential. People as consumers are interested in the first measure, while suppliers of services and producers of goods are more concerned with the second.

Suppliers of services want to locate where they are within reach of the largest number of potential customers. In this case the relative accessibility of a location for new shops or services can be measured in terms of the population round about and the time it takes for them to travel to that location.

Producers too want to be close to their potential markets, but they also have to take into account where their inputs come from. For some the two places may conveniently coincide, but for others, especially those whose activities are related to agriculture - such as sorting, packing, and processing of farm produce - the problem is to optimise their location with regard to both farmers and the eventual destination of their goods, particularly the larger urban conglomerations, or centers of consumption further afield.

The use of each measure.

Planners of course are interested in both measures. A measure of access to people is helpful in deciding where to locate new facilities - such as a health center, high school, or market - given an existing road system or assumptions about an improved system. A measure of access to functions is useful for evaluating alternative proposals for improving road networks in terms of the cumulative impact on access for the population of the area as a whole.

From the planners' perspective, the siting of facilities and the design of an improved road system are obviously inter-related. The optimum location for a service depends on the geographical distribution of the population and the shape of the road network, while the optimum solution for improving the road network depends on where services are located that people want to use. The two factors are also mutually reinforcing. Once roads have been improved to speed travel to a given settlement, new facilities will tend to locate there since it is now a better location. And as it grows, acquiring more and better facilities, so traffic to that place will increase, requiring better feeder roads from its hinterland. In a region like the north of Potosi, where there are at present few facilities and poor roads, it is essential to think of the two together. The choice of towns to serve as rural and local centers depends in part on their location vis-a-vis the population they are intended to serve, but decisions on improving the road network depend in part on the choice of urban service centers.

Calculating levels of access for evaluation purposes.

The first measure of accessibility, based on urban functions, has been explained previously. To recapitulate, individual access in zone i to establishments of the function j located in all n zones of the region and beyond is:

$$A_{ij} = \sum_{k=1}^{n} (N_{kj}/T_{ik}) \qquad \text{(Eq. 1)}$$

where N_{kj} = the number of establishments of function j in zone k;
and T_{ik} = the travel time from zone i to zone k.

Total individual access in zone i for all m functions being considered is:

$$A_i = \sum_{j=1}^{m} (A_{ij} \times W_j) \qquad \text{(Eq. 2)}$$

where W_j is a weight assigned to function j, based on estimates of the average number of visits to that function, the average travel time, and the proportion of the population that uses it.

Total access in zone i for all m functions, taking into account the population of the zone, P_i, is therefore:

$$AT_i = A_i \times P_i \qquad \text{(Eq. 3)}$$

and total accessibility throughout the subset of all 1 zones in the area under consideration is:

$$AA = \sum_{i=1}^{1} AT_i \qquad \text{(Eq. 4)}$$

Equation 1 shows that individual accessibility can be increased by adding new establishments, improving or constructing new roads which result in a reduction of travel times. Proposals for improving the road network, or packages of new services and facilities, can be evaluated in terms of their impact on accessibility, as measured by the change in both individual access in each zone, (A_i), and total accessibility for the population of the 1 zones in the area, (AA).

The second measure of accessibility, which can also be thought of as a measure of market potential, turns the calculation inside out. Potential accessibility for an establishment of type j located in the centroid of zone i, $AP_{i,j}$, is measured as a function of the population of each zone k which lies within the maximum travel time for that function as established from field surveys. (See chapter 5 of Part I.) Thus:

$$AP_{i,j} = \sum_{i=1}^{n} (P_k/T_{k,i}) \qquad \text{subject to } T_{k,i} < Tmax_j \qquad \text{(Eq. 5)}$$

where P_k = the population of zone k

$T_{k,i}$ = is the travel time from zone k to the centroid of zone i

and $Tmax_j$ = the maximum travel time to function j, as observed and estimated from field surveys.

This expression ignores the number of establishments of the function type in the centroid, since it is an estimate of potential access to consumers and not a measure of amenity provided by the centroid. It can be modified to take account of the fact that people living in large towns do not usually use the

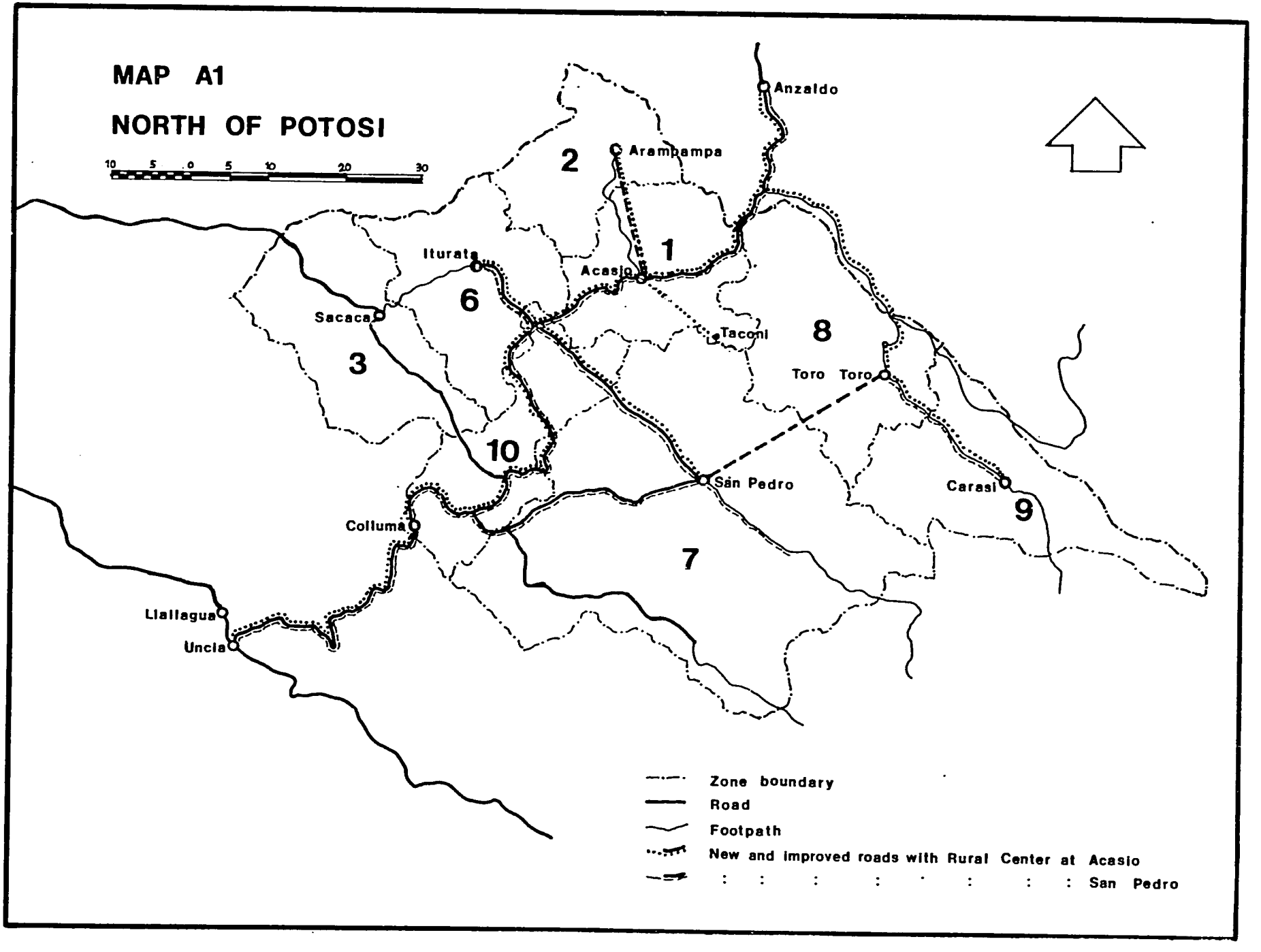
facilities of smaller places. The example that follows eliminates trips amenities in zone i by people living in other zones with two or more times the number of establishments of that function. However, this procedure is inappropriate for manufacturing functions, where it is important to take into account the market potential represented by the population of larger towns further afield. The denominator throughout the model is a function of the travel time between two zones, $f(T_{i,k})$. For purposes of simplifying explication, the denominator used here is $T_{i,k}$ itself, although of course there are many other forms that could be tested, some of which would no doubt prove to be more appropriate.

Given the expression in equation 5, potential access, or market potential, would be increased by a fall in travel times due to upgrading the road network, or a rise in population, which in the example below is assumed to remain constant. The estimates which result can be used to compare alternative sites for new services and facilities.

An illustration.

The use of the access model for the purposes of evaluating proposals is illustrated here with an example from the north of Potosi. (See map A1.) The area in question was defined in the course of spatial analyses of the Department as a whole, and is currently the subject of a development program which involved the design of a package of projects summarised in table 8.3 of Part I of this report. Two major components of the package are concerned with upgrading the road network in the area, which at present is extremely poor, and establishing a Rural Center with market, agricultural support services, and other essential facilities which are currently lacking.

The decisions to be made included choosing a settlement to function as the Rural Center, and comparing alternatives for improving the road system. Of the six settlements in the area with more than two hundred inhabitants, two were shortlisted as candidates for the Rural Center: Acasio, and San Pedro de Buena Vista, both small farming villages which had lost population over the previous twenty years. Of the two, San Pedro has historically been the more important place, with a slightly larger population today of just over five hundred. It was located closer to the center of the area, and according to the field survey possessed a larger range of urban functions, although many of these were not operational due to lack of maintainance, staff, or equipment.


MAP A1
NORTH OF POTOSI
10 5 0 5 10 20 30
Anzaldo
Arampampa
Iturata
Acasio
Sacaca
Taconi
Toro Toro
San Pedro
Carasi
Colluma
Llallagua
Uncia
1
2
3
6
7
8
9
10
Zone boundary
Road
Footpath
New and improved roads with Rural Center at Acasio
San Pedro

Acasio, on the other hand, with some 450 inhabitants, has the advantage of being surrounded by potentially more productive agricultural land, and is located on the only feasible route through the mountainous terrain of the area, a route that eventually is to become a main highway.

Table A1 estimates potential access by function based on equation 5, while table A2 shows total individual access by zones based on equation 2. Columns A and B of table A1 show that at present San Pedro is the preferred location without exception for all the functions listed, due partly to the large population in the zone itself, and partly to its geographical position at the center of the area. However, column A of table A2 indicates that the residents of the Acasio zone enjoy a somewhat higher level of accessibility overall than those of San Pedro, due mainly to their location on the one through road in the area, even though at present this road is in exceptionally bad condition. Nevertheless, by comparison with the average level of access for residents of the northern sub-region as a whole, which approaches 5500, it is clear that the inhabitants of these eight zones are poorly served indeed, ranging from 4600 at best in Sacaca to less than one hundred in the extremely isolated communities of Toro Toro and Pucara.

The first scenario to be explored is a package of services and facilities associated with establishing a Rural Center (market, health center, agricultural services etc) in Acasio, and Local Centers (high school, fuel store, limited farm supplies) in Sacaca, Arampampa, Toro Toro, and San Pedro. It ignores any improvements to the road system, and, as column B of table A2 shows, with the exception of Acasio itself where the level of access rises from 1000 to 1300, the impact is more or less insignificant.

By contrast, the second scenario ignores the provision of any new services and assumes simply that the main through route from Uncia in the west, through Acasio, to Anzaldo in the east over the Departmental boundary in Cochabamba, has been upgraded to an average speed of 40 kph throughout its length. Column C shows a sharp rise in the average level of access for the eight zones as a whole, from 1366 to 2400, but the incidence among zones is most uneven. The two zones straddling the highway, Toracari and Acasio, benefit from dramatic increases - up three and five times respectively - while the two most isolated zones gain little or nothing at all.

TABLE A1: POTENTIAL ACCESS BY FUNCTION FOR ESTABLISHMENTS LOCATED IN ACASIO AND SAN PEDRO DE BUENA VISTA: BASE CASE AND THREE SCENARIOS

Road network	Existing		A25	S25	A 4 0	
Zones	Acasio A	SPBV B	Acasio C	SPBV D	Acasio E	SPBV F
Population	5317	17302	5317	17302	5317	17302
Functions						
1 Junior school	7.6	11.3	7.7	11.3	7.7	11.3
2 Junior-high school	7.6	11.3	7.7	11.3	7.7	11.3
3 High school	7.6	11.3	7.7	11.3	7.7	11.3
4 Technical institute	7.6	11.3	7.7	11.3	7.7	11.3
5 Hospital/health center	15.8	17.0	22.4	30.6	33.8	26.4
6 Doctor/nurse clinic	9.7	12.9	13.4	20.0	24.7	16.1
7 Prefect/mayor	14.9	17.0	22.4	28.5	29.8	36.1
8 Police/magistrate	9.7	14.2	21.2	22.7	24.7	19.8
9 Seeds and fertilizers	25.9	31.7	41.2	48.7	53.8	47.7
10 Farm tools	19.5	24.0	34.1	39.5	43.2	35.6
11 Agricultural machinery*	-	-	-	-	-	-
12 Market	67.5	71.6	107.5	105.2	134.7	108.4
13 Farm produce storage	11.6	15.4	22.4	22.7	74.4	20.9
14 Farm prod processing	14.9	17.0	65.4	37.7	115.6	36.7
15 Mineral depository	14.9	17.0	86.9	37.7	116.1	58.2
16 Mineral processing	14.9	17.0	86.9	37.7	116.1	58.2
17 Grocery store	14.9	15.4	22.4	25.4	29.8	23.6
18 Shoes and clothing	19.9	26.0	33.5	36.4	41.4	36.8
19 Pharmacy	16.6	18.1	32.0	39.5	43.2	31.4
20 Fuel store	18.3	20.2	29.6	36.4	39.7	34.2
21 Hardware	16.1	18.7	27.2	32.8	38.5	28.6
22 Domestic appliances	24.8	28.1	34.7	37.6	41.0	36.5
23 Banks	9.7	11.3	13.4	19.0	23.7	16.1
24 Post Office	9.7	12.9	13.4	20.6	24.7	17.5
25 T'phones & radiocomm.	9.7	11.3	13.4	19.0	18.7	16.1

Potential access measured in thousands of units.

A25 Acasio as the Rural Center with feeder roads connecting to Local Centers, and highway between Uncia and Anzaldo upgraded to 25 kph.

S25 San Pedro de Buena Vista as Rural Center, with feeder roads connecting to Local Centers, and highway upgraded to 25 kph.

A40 As A25, but with main highway upgraded to 40 kph.

* Field survey provided no data to estimate potential access to this function.

TABLE A2: TOTAL INDIVIDUAL ACCESS BY ZONES IN THE NORTH OF POTOSI BASE CASE AND FIVE SCENARIOS

Zone		Population	Accessibility Existing A	New facils B	A40 C	A25 D	S25 E	BA40 F
1	Acasio	5317	990.3	1312.3	4741.5	4311.2	4117.4	5247.0
2	Arampampa	2048	261.8	383.6	410.6	1854.7	1757.1	2180.8
3	Sacaca	9100	4575.8	4710.7	5162.1	4790.0	4788.5	5380.1
6	Caracoma	5819	1099.7	1256.2	2104.4	1618.8	1602.6	2400.2
7	San Pedro de BV	17302	686.1	748.1	1144.9	1227.1	1414.0	1425.0
8	Toro Toro	5057	73.7	106.2	99.8	1489.0	1237.1	1697.6
9	Pucara	3663	8.6	27.8	8.6	1132.1	814.3	1311.7
10	Toracari	5517	1346.6	1468.7	4302.7	2443.5	2499.5	4522.5
Mean			1366.4	1479.6	2403.3	2343.4	2338.9	2940.9
Mean for sub-region			5489.9					
Total		53823	73545.4	79636.1	129355.0	126129.0	125866.0	158288.0

Access measured in thousands of units.

A Base Case as existing
B New facilities with Rural Center in Acasio, Local Centers in Arampampa, Sacaca, San Pedro and Toro Toro. No new or improved roads.
A40 No new facilities, but highway between Uncia and Anzaldo upgraded to 40 kph.
A25 As B, with highway upgraded to 25 kph, and feeder roads connecting Acasio to Local Centers (25 kph).
S25 As A25, with Rural Center in San Pedro, and feeder roads connecting San Pedro to Local Centers (25 kph).
BA40 As A25, with highway upgraded to 40 kph.

The third scenario maintains the same package of services and facilities as the first, but combines this with upgrading the through route to only 25 kph, and adding connecting links from the Rural Center, Acasio, to the four Local Centers. Column D of table A2 shows that mean individual access for the eight zones as a group increases almost as much as the second scenario, but in this case with a vastly more favorable impact for the residents of the three most inaccessible zones - Arampampa, Toro Toro, and Pucara.

The next alternative to be explored is similar, again with the highway upgraded to only 25 kph, but in this case with San Pedro as the Rural Center, Acasio as one of the four Local Centers, and feeder roads leading to San Pedro instead. As column E indicates, the overall outcome is little different: San Pedro itself of course comes off better; Pucara, the most isolated zone, improves, but not as much as before.

Although there is little to choose between these last two proposals from the point of view of residents, columns C and D of table A1 show that a road system connecting local centers to San Pedro, rather than Acasio, results in higher estimates of potential access, or market potential, for services and most facilities located in San Pedro under scenario four than in Acasio under alternative three. On the face of it, this would suggest that San Pedro would be the preferred Rural Center for storekeepers, health clinics, and other suppliers of services.

However, as table A2 shows, in all these scenarios Acasio emerges far ahead of San Pedro in terms of total individual access. Once the highway is upgraded, Acasio also becomes the better location for producers, especially those involved in agricultural and mineral processing activities. A rural settlement which enjoys better access to larger consumer markets is more likely to attract new rural industries. At the same time, it ought to attract more migrants from surrounding localities, not only because of the new job opportunities associated with those industries, but also because of its inherently better acccess for consumers to urban-based services and amenities. Together, these factors strongly favor the choice of Acasio over San Pedro as the Rural Center.

In the longer term, as the main highway through Acasio is further upgraded, the town will also become the preferred location for storekeepers and service

suppliers. A comparison between columns E and F of table A1, which show the potential access of the two settlements after the main highway has been improved to 40 kph, indicate that Acasio offers better access for most of those activities catering for more than just the immediate locality. Finally, column F of table A2 shows that with the faster highway, the average level of total individual access in the eight zones of the area rises to nearly 3000, a considerable improvement on the existing situation of 1360, moving closer to the sub-regional average of 5500. Nevertheless, it is clear that the accumulated neglect from which the area has long suffered will take many years and considerable further investment to bring it into line with other parts of the region.

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