ISN-25217 PD-AAR-678

CLASSIFICATION

PROJECT EVALUATION SUMMARY (PES) — PART I

Report Symbol U-447

1. PROJECT TITLE	2. PROJECT NUMBER	3. MISSION/AID/W OFFICE
Urban Functions in Rural Development	931-0210	DS/UD

4. EVALUATION NUMBER (Enter the number maintained by the reporting unit e.g., Country or AID/W Administrative Code, Fiscal Year, Serial No. beginning with No. 1 each FY) 1

☒ REGULAR EVALUATION ☐ SPECIAL EVALUATION

5. KEY PROJECT IMPLEMENTATION DATES			6. ESTIMATED PROJECT FUNDING	7. PERIOD COVERED BY EVALUATION
A. First PRO-AG or Equivalent FY 76	B. Final Obligation Expected FY 80	C. Final Input Delivery FY 80	A. Total $ 1,400 B. U.S. $ 1,050	From (month/yr.) 1/78 To (month/yr.) 10/78 Date of Evaluation Review

8. ACTION DECISIONS APPROVED BY MISSION OR AID/W OFFICE DIRECTOR

A. List decisions and/or unresolved issues; cite those items needing further study. (NOTE: Mission decisions which anticipate AID/W or regional office action should specify type of document, e.g., airgram, SPAR, PIO, which will present detailed request.)	B. NAME OF OFFICER RESPONSIBLE FOR ACTION	C. DATE ACTION TO BE COMPLETED
This project was evaluated 8 Nov. 1978 and there are no major issues or problems which will delay the accomplishment of the purpose for which this project was approved. The following reports are available through: DS/DIU Room 105 RPC, SA-18 Agency for International Development Washington, D.C. 20523 1. "Bicol River Basin Urban Functions in Rural Development Project: Summary and Evaluation by Dennis Rondinelli, dated March 1978 2. Report on Evaluative Site Visit to Project in the Philippines, dated September 1978, by Edgar M. Horwood, Consultant		

9. INVENTORY OF DOCUMENTS TO BE REVISED PER ABOVE DECISIONS

- ☐ Project Paper
- ☐ Financial Plan
- ☐ Logical Framework
- ☐ Project Agreement
- ☐ Implementation Plan e.g., CPI Network
- ☐ PIO/T
- ☐ PIO/C
- ☐ PIO/P
- ☐ Other (Specify) _____
- ☐ Other (Specify) _____

10. ALTERNATIVE DECISIONS ON FUTURE OF PROJECT

- A. ☒ Continue Project Without Change
- B. ☐ Change Project Design and/or ☐ Change Implementation Plan
- C. ☐ Discontinue Project

11. PROJECT OFFICER AND HOST COUNTRY OR OTHER RANKING PARTICIPANTS AS APPROPRIATE (Names and Titles)

JWD

John W. Dickey
Office of Urban Development
Bureau for Development Support

12. Mission/AID/W Office Director Approval

Signature: William R. Miner

Typed Name: William R. Miner

Date: 13 November 1978

AID 1330-15 (2-78)

XD-PAD-674-A
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ISN-25228

A REPORT TO

THE OFFICE OF

URBAN DEVELOPMENT/TECHNICAL ASSISTANCE

U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT

WASHINGTON, D.C.

ON THE

EVALUATIVE SITE VISIT

TO

THE BICOL URBAN FUNCTIONS

IN RURAL DEVELOPMENT PROJECT

THE PHILIPPINES

SEPTEMBER 25-29, 1978

BY

DR. EDGAR M. HORWOOD

CONSULTANT

Department of Civil Engineering
133 More Hall (FX-10)
University of Washington
Seattle, Washington 98195

October 25, 1978

Dr. John W. Dickey
Office of Urban Development
Room 508 SA-18
U.S. Department of State
Agency for International Development
Washington, D.C. 20523

Dear Dr. Dickey:

The following contain my findings, minutes and personal observations of our joint visit to the Philippines between September 25 and 29, 1978 to inspect the Bicol Urban Functions in Rural Development Project.

I trust this will be of service to you and the Office of Urban Development.

Sincerely yours,

Edgar M. Horwood

Edgar M. Horwood
Professor of Civil Engineering
and Urban Planning

3.

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Introduction

This report covers the visitation of the AID, DS/UD inspection trip to the Philippines held during the week of September 25, 1978. The inspection team included Dr. John W. Dickey, representing AID, DS/UD, Washington, D.C., and Dr. Edgar M. Horwood, Consultant from the University of Washington. The report contains only the findings of the consultant.

The inspection was substantially hampered by typhoon Wellman, which postponed the visit to the project area because of the cancellation of flights.

Unfortunately, a specific review of the data and its findings did not take place during the inspection trip to serve as a current reference for the inspection team, but the quarterly reports and summary findings of the project's major consultant, Dr. Dennis A. Rondinelli, were available at the time of the visit.

Although six months had elapsed since the formal completion of the project, the final report of the local investigator, Dr. Ramon L. Nasol, UP Los Baños, had not been produced. It would have been better, of course, to have had that document in hand at the time of the site visit. In the absence of that report and in view of the somewhat limited schedule of meetings occasioned by the typhoon, considerable attention will be given to:

(1) The thesis of Rondinelli/Ruddle in Urbanization and Rural Development: A Spatial Policy for Equitable Growth, by Dennis A. Rondinelli and Kenneth Ruddle;[1]

(2) The summary report on and evaluation of the project by Dr. Rondinelli, dated March, 1978 (referred to herein as the Summary Report);

(3) Comments of Dr. John W. Dickey on the above report; and

(4) Comments on the Rondinelli approach by anthropologists unknown to the consultant, furnished by Dr. Dickey (referred to herein as the "anthropologists' critique").

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[1] Praeger: New York, 1978, 221 pp.

A Note on the Rondinelli/Ruddle Thesis with References to the UFRD Project

The concept of developing urban functions in coordination with rural development as outlined by the above thesis is, on the surface, an appealing one that responds to the logic of the Central Place Theory stemming from Walter Christaller,[1] Edward L. Ullman,[2] Brian Berry and Alan Pred,[3] et. al. Anyone familiar with the lesser developed countries (LDC's) is well aware of the structure of one or two primate cities, a few second order cities and a relatively large number of extremely low order village settlements.

Similarly understood is the point made by Rondinelli and Ruddle that the various aid program policies of the 60's based on the "filter down" philosophy of strengthening the economies of primate cities have left abject rural poverty on the one hand and overcrowded, inefficient primate cities on the other. Consequently, the argument presented by the authors for achieving equitable growth through a spatial integration and development policy is at first glance an interesting one, based on the hierarchy of settlements as we know them in the developed world as a well articulated spatial economic system in a nation's economy.

A question that is more ponderable, however, is how the attention of national governments in LDC's would be brought to bear in programs that redistribute wealth on the basis of a geographic theory known by few and at the cost of overwhelming competing needs in the primate cities for infrastructure, security, employment, etc. This competition is exemplified in

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[1] Die Zentralen Orte in Süddentschland, Jenu: Gustav Fischer Verlag.

[2] "A Theory of Location for Cities," American Journal of Sociology, 46: 853-64.

[3] Central Place Studies: A Bibliography of Theory and Applications, Philadelphia: Regional Science Research Institute, 1961.

the Philippines by such projects as the recent development of the freeway in the Manila area, the construction of a massive cultural center in Manila, the costly and expansive University campus at Los Baños, etc. The poor tend to have no constituency, and particularly the abject rural poor who are invisible to central government administrations in the primate city. On the other hand, urban slums, squatter's settlements and unbelievable traffic congestion are all too obvious in the primate center.

The Anthropologists' Critique picks up on this point in their second paragraph on page four, which states that:

> "Socially well organized local or regional groups have been able to contend for economic favoritism, either through formal or informal political channels. The behavior of investment in infrastructure development by national or international entities has responded in part to these political forces."

Understandably, from the viewpoint of A.I.D., DS/UD's interest in helping the poor, the Rondinelli/Ruddle thesis is attempting to break the link to the type of foreign aid referred to in the second sentence of the above quotation. However the two sentences of the quotation must be viewed as a conjoint observation insofar as the USAID programs in general are cost sharing with the recipient governments; and in particular, the A.I.D., DS/UD's Bicol project is only a planning one that requires Philippine government financial intervention to implement it.

Conceivably the integration of the Rondinelli/Ruddle concept with the USAID Rural Services Center Project (RSCP) in the Philippines could, or still may, serve as the needed link between the study in question and some programmed experimental output -- say in the Bicol areas of Naga, Legaspi and Calbayog, which are part of the 15 centers of the RSCP. However, discussions with Mr. William Sommers, director of the RSCP, on September 26,

did not reveal any formal link between the RSCP and AID, DS/UD project in the Bicol. Furthermore, the Naga portion of the RSCP was referred to in the meeting as a "bust." Undoubtedly, the RSCP is probably not oriented to dealing with the lower order places in the local regions of its 15 centers

The advent of the Bicol River Basin Program (BRBP), with its coordinatir committee and program office staff, was obviously a point of note in the selection of a site in which to undertake the Urban Functions in Rural Development (UFRD) project. (See P. 6 of Summary Report.) However, the Rondinelli conceptual scheme lacks any implementation model, and when confronted with the completion of the study the BRBP operational officers contacted seemed not to have any grasp of implementation concepts. The expenditure of the last $7,000 on such a follow through via a contract with Mr. Ragragio may be too little and too late. This consultant must agree with the findings of Dr. Dickey that the project is data rich and implementation poor.

The Anthropologists' Critique lays in some heavy blows on the conceptua framework of Rondinelli/Ruddle. Most of this criticism seems valid in an academic context -- the framework's lack of concern with caste and class; the lack of concern with the dynamics of change; etc. Nevertheless, in defense of Rondinelli/Ruddle, it does deal with the one central conceptual issue of geogrphic hierarchy -- simplistic as it may be. Also, it is doubtful if the approaches advanced by the anthropologists, interesting as they were, would have accomplished any more.

Within the context of the Rondinelli/Ruddle thesis, the most compelling criticism that comes to mind relates to the impacts of changes in scale and function of settlements when existing hierarchies are disturbed, as by

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transport change The thesis implies that by modest adjustments to the market system there will be a catalytic response that supplies some net gain to the fulfillment of human needs. That is to say that the system will be tipped off its dead center status and respond to a momentum that will restore or create a continued self cycling process -- to use a mechanical analogy. The addition of some missing functions to some places might in turn induce a change of scale that would induce additional functions. However, there are customarily winners and losers in changes of centrality index, however modest they are -- at least in the Western culture,[1] and probably in a universal context. With the strengthening of "n" order places, "n-1" order places will lose some viability, such as an agro-processing facility or private medical clinic in the case in question.

In other regards, technological change is often the bedfellow of changes in patterns of hierarchy. For those centers positively impacted, the growing functions tend to move up the technological and productivity scale -- at least in the Western culture, and again no doubt in a universal context. As an example in the Bicol, with the exception of the coastal or near coastal communities of Tigaon, Goa and Tabaco, with only one exception (Nabua), the nine local service centers lie on the Japan Friendship highway. It may have been worthwhile to study their changes in functions over the past few decennial census periods.

Certainly, the thesis of Rondinelli and Ruddle is an interesting one and the work undertaken in the Philippines for the Bicol region constitutes a very interesting data base, even within the static constraints. The siting of the UFRD project in the Bicol region seems to be ideal in regard

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[1] Garrison, William L., Brian J. L. Berry, Duane F. Marble, John D. Nysteun and Richard L. Merrill, Studies of Highway Development and Geographic Change, Seattle: University of Washington Press, 1959, 291 pp.

to the national attention given to the Bicol by the development of the Bicol River Basin development program. However, the test of the thesis is yet to come. Six months is probably too short a time in which to expect any significant follow-up of the program Dr. Rondinelli devised, within the customary pace of activity in LDC's. Certainly the study has to be viewed as an experiment in keeping with the primary statement in the Rondinelli/Ruddle thesis: "...policy making is an incremental, groping process of trial and error..." and "...most complex problems escape deliberate solution." (P. 1)

It is also interesting to note the Rondinelli/Ruddle references to changing policies of LDC's (such as the Philippines, Thailand, El Salvador and Kenya, etc.) in which the LDC's claim, according to the authors, that "...no longer is maximum economic growth a singular apex of goals...equally desired are maximal employment, promotion of social development and more equitable distribution of income and wealth." Such statements are of course slogans as much as goals and their very existence does not imply that there will be any rational follow-up. While many references are made to LDC's espousal of income distribution policies, a close inspection of the Rondinelli/Ruddle work discloses few successes to date, if any. Of course it may be too early to judge these policies in view of their relative recent advent, but one can hardly base estimates of change on slogans. Perhaps the major citation for success is the development of roads in Ethiopia in the 50's and early 60's which had a significant impact on agricultural productivity. In fact, there seems to be a parallel between the Ethiopian example and the development of the Japan Friendship road in the Philippines by virtue of the fact that preliminary findings in the Bicol area show a strong concentration

of the attractivity of urban functions to the communities situated directly in the highway corridor.

The major problem to be faced in making the Rondinelli/Ruddle thesis work is the allocation of national resources to areas from which tax monies are now either nonexistent or extremely low, and via a highly centralized bureaucracy which is no doubt substantially influenced by pressures from highly developed areas and economic sectors.

Observations on the Rondinelli Summary and Evaluation

These observations must necessarily come from the summary report of Dr. Rondinelli and the quarterly reports that led to it, because that is the only data base available to this observer. (In addition, a few reports of the project were perused in the USAID office in Manila during the visitation, but they are not available to this consultant for study in depth.)

One would tend to give Dr. Rondinelli relatively high marks for his capability in carrying out, at a great distance and with only a few visits, detailed field studies that directly relate to his thesis. There appears to be a wealth of good background information, in spite of the limitations previously noted. Just one of the studies on rural health services that was viewed in the USAID office was of great interest and apparent value in presenting the conditions extant in the Bicol in the health sector.

One does get the feeling, however, that the major analytical studies were undertaken almost exclusively by one or two people, particularly the efforts of Mr. Junio Ragragio, who undertook a thesis for the University of Philippines at Diliman contemporaneously with his work on the project. (Dr. Rondinelli recognizes this contribution in his Summary Report, p. 44.) Also the management of the study on site seems to have been less than ideally articulated, again as the comments of Rondinelli bring forth (Pp. 33 and 34, Summary and Evaluation).

While the findings are interesting, and provocative, serious questions now arise as to the capability of anyone to do something with the findings, insofar as the specific objectives of the project go beyond analysis, to the establishment of criteria for future investments in services and facilities (p. 3 of Summary and Evaluation). The study objectives further purport to test appropriate methods of spatial analysis that could be modified and

updated as part of a continuing planning process within the BRBDP. These objectives do not seem to have been carried out in any depth, if indeed at all. The question therefore is: Who is going to put the bell on the cat?

While the officials of BRBDP seem to be aware of the study, there is yet to be some plan of action devised, and experience indicates that programs which have strong regional infrastructure development goals, such as in flood control and irrigation, find it difficult to handle other things in the perimeter of their vision. As an example, it was many years after the creation of our own TVA before it could handle anything but the building of major dams. The view of this observer is that the BRBDP will not be able to effectuate use of the findings unless two things occur: (1) detailed plans for projects or experiments that lie within the study goals; and (2) there is some allocation of funding to carry out some limited development of experimental projects. The allocation of the remaining $7,000 to Mr. Ragragio's firm to carry out some of the detailed work seems a step in the right direction, but represents a rather meager resource. It would appear to use the continual employment of someone like Mr. Ragragio, or have a sustaining contract with his firm, to keep the UFRD part of the total program of the Bicol alive.

A criticism one could make of the technical studies is that they did not take advantage of recently constructed surface roads in the BRBDP as a means of testing changes in the patterns of centrality and marketing. It should still be possible to make such tests to gain an idea of what some level of infrastructural development will produce in regard to changes in the services and hierarchy of communities affected.

Rondinelli himself alludes to the need to make extensive investments in roads and other infrastructure, services and productive activities, located

strategically in intermediate size cities, smaller towns and market centers to encourage the growth of new rural service centers. The question therefore is: What will happen in the absence of such investments within the BRBDP financial structure, or the absence of such investments from national sources? While the policy is experimental, again according to Rondinelli, the problems of securing political support for experimental programs is very difficult under the usual LDC conditions of great national capital limitations to deal with the national developmental needs. The only bright spot in this picture is the fact that the BRBDP was itself created by the Philippine government to assist a local region.

Conclusions and Recommendations

1. The UFRD project has been data rich in regard to particular data sets relating to the activity systems of locations, but the conceptual scheme lacks consideration of organization for the political use of the data. The outcome to date is thus a snapshot of static conditions. It is essentially a data compendium structured to codify activity centers and create a broader understanding of the region at a point in time. Perhaps less of the study resources should have gone into the data base and more on its outcome.

2. The replication of the project elsewhere would be presumptuous until some outcomes are demonstrated -- outcomes of an experimental or programmatic nature at least.

3. It is as yet uncertain as to what will be institutionalized in the BRBDP. The form of the planning process to use the findings has not been explicated and the location of resources to change the static conditions in some programmatic way is unknown.

4. The advent of the new Ministry of Human Settlements is interesting, but it will take some time before it could bring resources to bear on the issues of the UFRD Program, if it can indeed do so in the intermediate future.

5. The entire thesis behind the UFRD concept should remain under examination. It will not even reach the experimental stage until some programmatic outcomes are evident. AID, DS/UD should monitor its consequences before final conclusions on its efficacy are drawn. UFRD concepts espoused by Rondinelli remain as yet a thesis.

6. There should be some valuable experience gained by AID, DS/UD from continuing some limited or periodic funding in the Bicol to insure some utility of the recent program and assess its significance.

LIST OF ABBREVIATIONS

AID/W, DS/UD, A.I.D. (Development Support)

BRBP (Bicol River Basin Program)

BRBCC (BRB Coordinating Committee)

UPLB (Univ. Philippines, Los Baños)

UFRD (Urban Functions in Rural Development)

LDC (Lesser Developed Country)

RSCP (Rural Services Center Project)

TVA (Tennessee Valley Administration)

MEETING AT CENTER FOR POLICY AND DEVELOPMENT STUDIES: UPLB, Friday, Sept. 15, 1978

Present were the following:

Dr. Ramon L. Nasol, Director of the Center

Mr. Junio Regragio, Private Consultant, and formerly connected with the project

Dr. John W. Dickey, USAID UD/TA

Dr. Edgar M. Horwood, Consultant to USAID

Initial discussion related to the final report, which Dr. Nasol promised to be ready in one month's time. Dr. Nasol then discussed the recent creation of the Ministry of Human Settlements under the first lady of the Philippines, including a task force on human settlements. Each municipality would have a coordinator through the Ministry.

Dr. Dickey asked what could be done to help spread the word of the program. Dr. Nasol replied that printing the monograph would be helpful.

In response to further questions from Dr. Dickey regarding the future of the project, Dr. Nasol said that more refinement is needed and specific projects need identification. He stated that the Bicol River Basin Development Program (BRBDP) could do the job administratively, but doubted if it would have the manpower and the best planning staff to do so. He stated that he went down to the area every month and was continuously involved personally. Dr. Horwood queried as to whether the government had a local market help function. Then Dr. Nasol replied that it was entirely subsumed under the general municipal functions.

Considerable time was then spent regarding administrative problems of the project, including the inability to pay several staff for recent work. Dr. Nasol assured us that everything would be under control.

Comment. Dr. Nasol seemed to be a very busy academician and institute director with good connections to national government agencies. He had met the first lady just recently in connection with her visitation to the region. It appears that he could play a key role in furthering the USAID project after its completion, but no doubt could spend very little time in the program or develop in detail any follow-up experiments or programs. It would appear, however, that without continued funding support his services would be unavailable.

There is some question in the mind of this observer as to the pertinence of the mainstream work of the Center for Policy and Development Studies to the UFRD program. The latter operates at a micro level of analysis and in a geographic framework. The description of the Center handed to us at the meeting raises some concerns on this point.

DISCUSSION AT USAID PROGRAM OFFICE: Manila, Tuesday, September 26, 1978

Present were Mr. William Sommers, Head of the Rural Services Project, in addition to Dickey and Horwood.

Mr. Sommers mentioned that the Rural Services Center Project (RSCP) is a grant program relating to fifteen intermediate cities in the Philippines. Attention was on problems of the poor. It is a contract with the Ministry of Local Government, with 75 percent of the cost reimbursed from USAID sources (apparently out of PL480 money). He mentioned in particular three centers of attention in the program -- the centers of Naga, Legaspi, and Calbayog. He expressed deep concerns over the outcome of the program in Naga (details unknown). RSCP gives supplies to the program, such as office equipment, transport, etc.

Mr. Sommers mentioned that USAID had 40 million dollars in loans to provinces of the Philippines for roads. These are roads approved by the Philippine Ministry of Public Works and AID, with 75 percent of the money reimbursable from USAID funds. It took approximately eight months to get a project through the system, with each project averaging about US $30,000. He mentioned that the province of Camarines Sur, in the Bicol, had built 33 projects under both flood control and rural roads programs. He also mentioned that Philippines Public Highways has an urban and rural road program (no details given). There is in addition the existence of the Provincial Development Assistance Program (PDAP), but again no particulars were given as to its functions.

Dr. Dickey inquired if the Bicol data could relate to other programs. The answer was yes and that the Bicol River Basin Commission (BRBC) would be the agency to relate it to other projects.

Commert. Relationships between the RSCP and the Bicol UDRF Project were not made explicit. One wonders why the UFRD Project was not better integrated with the RSCP. No mention of RSCP appears in Rondinelli's diagram of Organizational Structure of the BRBDP and the UFRD Program (Figure 7, p. 32 of the Summary and Evaluation Report). Otherwise, Rondinelli makes no mention of the RSCP. Conceivably, coordination took place at the level of the Bicol River Basin Coordinating Committee, but it is not evident. A significant opportunity may have been lost in not studying the impact of some of the 33 RSCP Projects in the Bicol within the UFRD Program. The methodology of the UFRD Program seems too tightly constructed to have permitted such an excursion.

MEETING AT BRBDP OFFICE: Naga, Thursday afternoon, September 28, 1978

Mr. Ben Goan, the key person in terms of the USAID planning program follow-up, was on his way to Manila for a meeting and in his place Mr. Rey de Sagun, Head of Planning and Projects Development, spoke to Ragragio, Dickey and Horwood.

Dickey requested that the program draw up a detail for the use of the $7,000 remaining for follow-up work to test portions of the project findings in the Naga area.

Ragragio asked how he viewed the urban function study, and de Sagun replied that he saw it as the identification of levels of service need. He desired a successful transfer of planning technology.

The meeting was concluded after about a half hour of discussion due to the need of the USAID team to drive down to Legaspi.

Comment. The meeting could not get into depth on any issues. Nothing emerges as a finding, except that it was an occasion to bring the UFRD Program into some visibility and discuss the need for the expenditure of the remaining money on specific project development planning.

MEETING AT THE BRBDP OFFICE IN LEGASPI: 5:00 pm, Thursday, September 28, 1978

Present were:

Bruno S. Navere, Provincial Development Coordinator for the province of Albay

Marsella S. Samsan, Project Officer for the Quinali Agro-industrial IDA project with BRBDP

Ragragio, Dickey and Horwood met with the above.

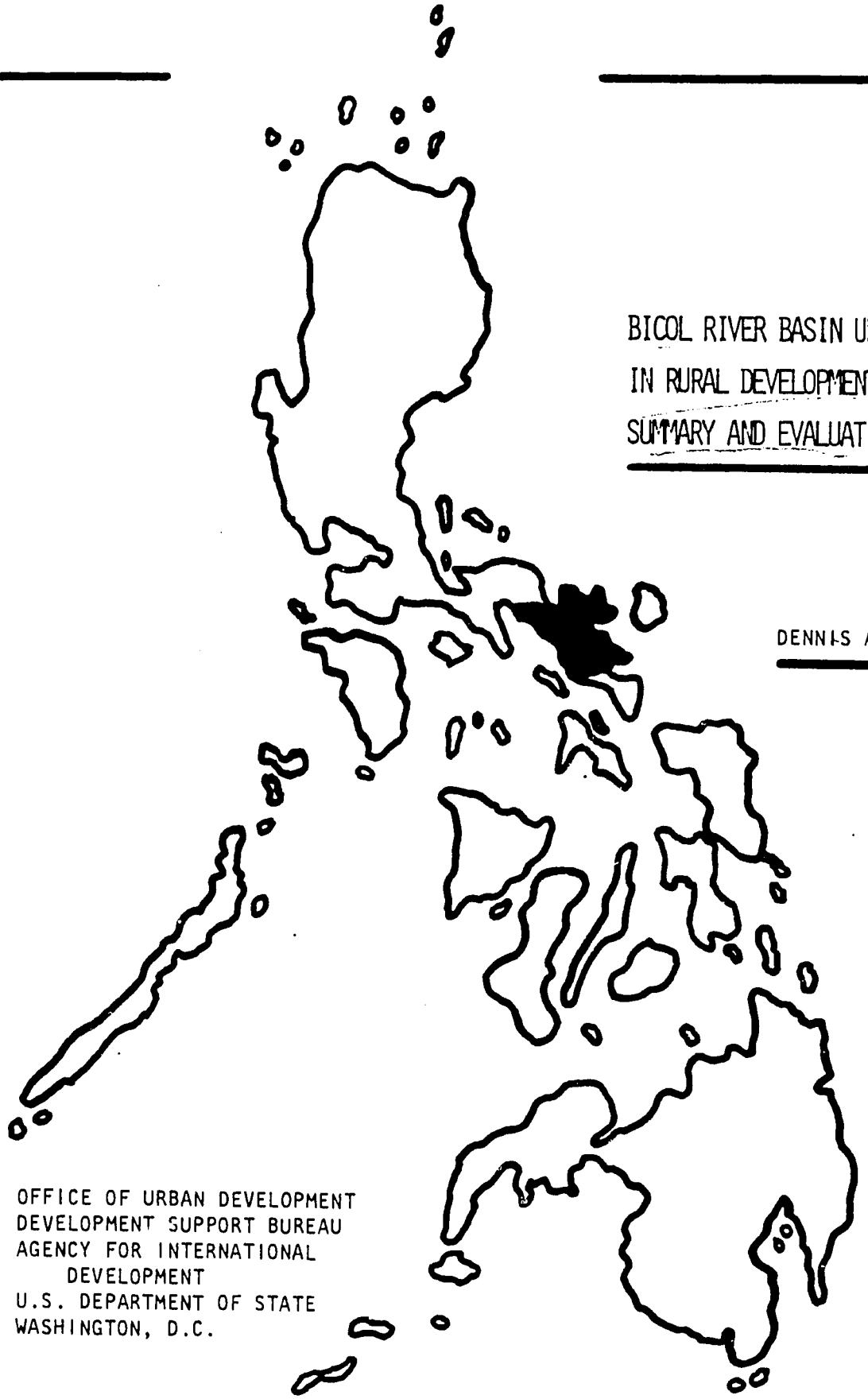
As the hour was late, past the closing time of the office, the discussion was relatively short. Bruno Navere hoped to make use of the urban data for a provincial development plan. Dickey referred to the missing link in the study in regard to requirements of the follow-up. Further discussion was continued at dinner in the Mayon Hotel.

Comment. Bruno Navere appeared to be energetic and well-known in the Legaspi community, to be of assistance to any follow-up. He seemed to have a good understanding of the nature of the study. However, the mechanics of the follow-up are uncertain and precluded any in-depth discussion.

BICOL RIVER BASIN URBAN FUNCTIONS IN RURAL DEVELOPMENT PROJECT: SUMMARY AND EVALUATION

by

DENNIS A. RONDINELLI



OFFICE OF URBAN DEVELOPMENT
DEVELOPMENT SUPPORT BUREAU
AGENCY FOR INTERNATIONAL
DEVELOPMENT
U.S. DEPARTMENT OF STATE
WASHINGTON, D.C.

PN-AAT-928
ISN-25229

BICOL RIVER BASIN

URBAN FUNCTIONS IN RURAL DEVELOPMENT PROJECT:

SUMMARY AND EVALUATION

by

DENNIS A. RONDINELLI

for

OFFICE OF URBAN DEVELOPMENT
DEVELOPMENT SUPPORT BUREAU
AGENCY FOR INTERNATIONAL DEVELOPMENT
U.S. DEPARTMENT OF STATE
WASHINGTON, D. C.

MARCH 1978

CONTRACT NUMBER AID/ta-C-1356

DENNIS A. RONDINELLI is Director of the Graduate Planning Program at the Maxwell School of Citizenship and Public Affairs at Syracuse University, Syracuse, New York. He is a consultant on development administration, urban and regional development and project planning and implementation and has been a technical assistance adviser to government and private organizations in Asia, Latin America and the United States.

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LETTER OF TRANSMITTAL

March 31, 1978

Dr. William Miner
Director, Office of Urban Development
Bureau of Development Support
Agency for International Development
U.S. Department of State
Washington, D.C. 20523

Dear Dr. Miner:

This report is a summary and evaluation of the Bicol River Basin Urban Functions in Rural Development Project sponsored by the Office of Urban Development through a grant from the U.S. Agency for International Development to the Government of the Republic of the Philippines and the Bicol River Basin Development Program. This report reviews briefly the background and rationale for the project, the major substantive findings and recommendations, and the procedures, organization, and methodologies used in implementation. It provides an overall evaluation of the project as well as suggestions for follow-up activities in the Philippines and for replication of pilot projects in other countries.

No attempt has been made in this report to document all of the findings or to reproduce the many tables, charts, and maps that appear in the final plan. This report will serve as an "executive summary" and anyone interested in the details and supporting materials may refer to the research volumes and plans submitted to the Bicol River Basin Development Program by the Center for Policy and Development Studies of the University of the Philippines--Los Banos.

I would like to express my sincere appreciation to you and to various individuals in your office, especially Eric Chetwynd, Michael McNulty and John Dickey, who facilitated my field visits and provided logistical support from Washington; to the staff of the USAID Mission in the Philippines, especially Don F. Wadley and his associates in the Office of Regional Development who provided support in Manila and Bicol; to Dr. David S. Sawicki and Dr. Gerard Rushton, who provided technical assistance; and to a large number of extremely competent and invariably hospitable Philippine staff members, consultants and support personnel

who carried out the project. Mr. Emmanuel Astillero, Mr. Junio Ragragio and Miss Joclyn Tria deserve special recognition for their dedication and perseverance.

Although I drew heavily on preliminary drafts of the final report and plan in order to summarize and evaluate the project, many of the conclusions and judgments are my own and no one else involved in the project should be held responsible for them.

Sincerely,

Dennis A. Rondinelli

Dennis A. Rondinelli
Senior U.S. Consultant

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CONCEPT AND BACKGROUND

The Bicol River Basin Urban Functions in Rural Development Project was undertaken to develop a plan that would strengthen the contribution of urban centers--through their services, facilities and productive activities--to rural development in the Bicol River Basin of the Philippines, and a planning process that would also be potentially valid and applicable in other developing nations.

The project was based on the assumption that urban centers can play a crucial role in rural development, but that their potential functions have been highly constrained and largely unexploited by governments in developing countries. The project was funded by the Urban Development Office of the U.S. Agency for International Development (USAID), in cooperation with the USAID Mission in the Philippines, through a grant to the Government of the Philippines and the Bicol River Basin Development Program (BRBDP). It sought to develop a methodology for spatial analysis and planning that would identify the components and characteristics of the settlement system, determine the distribution of "urban functions" and delineate the linkages between urban centers and rural areas that provide access for rural people to urban services and facilities. 1/

The specific objectives of the project were to:

1. Analyze the spatial system of an underdeveloped region such as the Bicol River Basin in order to determine the extent to which the pattern of human settlement contributes to the potential for rural development;

2. Determine the degree to which the spatial system is sufficiently articulated to allow equitable distribution of services, facilities, technical inputs and commercial activities to stimulate agricultural production and overall rural development, and to facilitate the marketing and distribution of rural products;

3. Describe the distribution of existing services, facilities, infrastructure and productive activities, and determine their accessibility by the rural poor;

1/ See U.S. Agency for International Development, Office of Rural Development, "Urban Functions in Rural Development Project Paper," Washington: USAID, 1976, mimeographed.

4. Establish general locational criteria for future investments in services and facilities that will contribute to stimulating the overall growth of the region, increase the access of unserved or poorly served people to "urban functions" and create a more articulated and better integrated hierarchy of settlements; and,

5. Test appropriate methods of spatial analysis that could be modified and updated as part of the continuing planning process within the BRBDP and adapted by local and provincial governments within the Basin.

The Bicol River Basin Urban Functions in Rural Development Project was the first of three pilot efforts to be undertaken by the Urban Development Office in order to "strengthen urban analysis, activities and functions which are complementary to rural development" in nations assisted by USAID. 2/ Office of Urban Development analysts, in designing the overall program, contended that the spatial dimensions of development are crucial to the success of USAID's "new directions" in policy aimed at reaching the poor majority in developing countries, and that the functions of urban centers are essential to support rural development. "In addition to being the loci of opportunities for off-farm employment," they noted, "urban centers provide marketing, storage, processing, supply, credit, health, educational and other services to the rural areas they serve." They concluded that "rural areas without easy access to such centers and services cannot prosper and those without access to fully functional and efficient centers are denied their full development potential." 3/

The project would both gather additional information about the nature of the relationship between urban and rural development and test analytical and planning methodologies. Analysts in the Office of Urban Development pointed out that:

> The linkages between rural development and urban centers are clear, and the existing literature identifies and provides considerable insight into the kinds of general services and functions required at the level of the rural market town to support rural development. Less progress has been made in identifying similar facilities and services at other levels of the

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2/ Ibid., pp. 6-7.
3/ Ibid., p. 4.

> urban hierarchy--i.e., in the regional and supraregional centers--and little has been written of a comprehensive nature. More understanding is needed of the mix, magnitude and timing (i.e., order of priority) and location of facilities and services at all levels and for different types of agricultural patterns. In addition, practical information is needed on alternative ways of providing the required services and facilities. 4/

The ultimate outputs of the three pilot projects would be a process of analysis and a "package" of analytical techniques and methods for planning that would assist USAID and developing country planners to design policies and programs for strengthening the role of urban centers in rural development. The methods tested and proven effective in these three developing nations would be consolidated into an "information package" to be published by the Office of Urban Development and distributed to USAID Missions. Seminars and workshops would be conducted for Missions in each major geographical region to disseminate the results.

The Conceptual Framework

The importance of the spatial dimensions to USAID's "new directions" in development policy was strongly confirmed in a preparatory research study conducted for the Office of Urban Development in 1976. The report, Urban Functions in Rural Development: An Analysis of Integrated Spatial Development Policy, by Dennis A. Rondinelli and Kenneth Ruddle, found that spatial development patterns in most developing countries were not conducive to equitable growth in rural areas. 5/ Although metropolitan centers and smaller cities could play an important role in stimulating rural development, in most less developed countries they were not well-dispersed, and were often poorly linked to their rural hinterlands. In many countries the rural poor lacked access to the services, facilities and productive activities found in urban centers, and as a result the cities did not provide inputs needed to increase agricultural production or meet

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4/ Ibid., p. 4.
5/ The study was subsequently revised for publication. See Dennis A. Rondinelli and Kenneth Ruddle, Urbanization and Rural Development: A Spatial Policy for Equitable Growth, New York: Praeger, 1978.

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basic human needs in rural regions.

In most of the developing world, spatial development reflected the highly dualistic nature of economic growth. Investment was heavily concentrated in one or a few metropolitan centers, usually in a "primate city," which came to dominate the national economy and overshadow all other cities in the spatial system, retarding the dispersion of economic activities to smaller towns and rural areas. The primate city usually received the largest proportion of national investment in infrastructure, commercial and service activities, manufacturing and industrial enterprise, utilities and services, and thus became an enclave of more modern institutions and technology. As a result, these premier cities attracted large populations, and their residents generally earned higher incomes and had greater access to services and amenities. But these larger cities often drained their rural hinterlands of their most productive manpower, natural resources and investment capital. Moreover, as larger numbers of migrants were attracted to the primate cities, their facilities became overburdened and their capacity to provide new jobs was severely strained, leaving large numbers of unskilled and unemployed people living in urban poverty.

Dualistic economic growth created and maintained a highly skewed settlement pattern. The primate city not only constrained the growth of other metropolitan centers, but also limited the number and distribution of middle-size cities that might support industrial activities and other economic and social functions throughout the country. Thus, many developing nations have spatial systems in which middle-level cities and market towns--which have sufficiently large population thresholds to support services and facilities needed to meet basic human needs, provide outlets for the sale of agricultural goods, produce agricultural inputs, and provide off-farm employment for surplus agricultural workers--are neither numerous enough nor adequately distributed geographically to serve the rural poor.

The classical pattern is clearly reflected in the spatial development of the Philippines, where the Manila Metropolitan area in 1970, with less than one third of the country's population, accounted for 65 percent of family income, 79 percent of all people employed in manufacturing, 81 percent of total manufacturing production, 63 percent of transportation vehicles, and over 80 percent of national electrical power production and consumption. Average family income in Manila is double that of the Philippines.

By 1975, Manila had grown to over 10 times the size of the next two largest cities, and only a little more than a dozen cities in the country had grown in population size to more than 100,000. 6/

A similar spatial pattern appears in the rural regions of these developing countries. Again, one or two provincial capitals or regional centers amass most of the services, facilities and productive activities. The overwhelming majority of the population, however, is scattered in small villages or on individual farmsteads, with little or no access to the functions found in town centers.

The Rondinelli-Ruddle report suggested that if international assistance agencies and LDC governments were to make a significant impact on improving the lives of the rural poor, then they would have to make extensive investments in rural infrastructure, services and productive activities, located strategically in intermediate size cities, smaller towns and market centers and encourage the growth of new rural service centers, linking these places with rural hinterlands.

An articulated and integrated network of cities and market towns closely linked to rural areas would provide a means of: (1) expanding markets for increased agricultural production, thereby increasing income in rural areas; (2) extending services such as health, education, family planning and vocational training, the technical inputs needed for increased agricultural production such as new seed varieties, appropriate technology, farm-to-market roads, and electrification, as well as communications and transportation; (3) offering new rural employment opportunities, especially in agro-processing, agribusiness, small-scale manufacturing and cottage industry; and (4) slowing the rate, and altering the pattern, of migration from rural to urban areas.

The report also concluded that the pattern, composition and functional roles of urban centers in the spatial systems of developing nations differ drastically among countries, and that any serious effort to shape the spatial system to promote rural development would require extensive analysis. An analytical study with three major components

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6/ See Dennis A. Rondinelli, Joseph F. Lombardo, Jr. and Gar-on Anthony Yeh, "A Decentralized Urbanization Policy for Migration and Population Growth Planning in Asia," The Asian Economic and Social Review, forthcoming, 1978.

was recommended:

1. Analysis of Rural Resources and Activities: including such factors as physical characteristics of the region, land and resource uses, cropping patterns, volume and diversity of agricultural production, population distribution and rural settlement patterns, services and facilities distribution, nonagricultural commercial and manufacturing activities, and subsistence systems characteristics;

2. Analysis of Central Places: including the location of market towns, small cities, intermediate or regional centers; the size, composition, and density of urban places, the location, concentration and dispersion of major social and economic activities, changes in size and concentration of functions over time, and the labor force and income distribution characteristics of communities; and,

3. Analysis of Regional Spatial Linkages: including physical, economic, population movement, technological social-service delivery, political, and institutional interaction among settlements within the region and their linkages with external places.

The Rondinelli-Ruddle report proposed a general framework for analysis (see Figure 1) that could be modified, adapted to local conditions, and tested in a number of developing countries. The scarcity of data and general unreliability of statistics in LDCs, and the need for analytical techniques that could be easily applied and readily understood in rural regions, mandated substantial testing and adaptation of any analytical framework.

Selection of the Bicol River Basin Project

The Bicol River Basin in the Philippines became the first of the three pilot projects. The Basin was chosen because of its relatively high levels of poverty, the existence of a regional planning and development agency willing to undertake the study, the relatively good data base found in the Philippines and the availability of highly trained local manpower capable of implementing the project successfully. The Bicol River Basin Council had an active and well-organized development program, had undertaken a number of resource and baseline analyses, and through funding from the U.S. Agency for International Development, the Government of the Philippines and various multi-lateral and bilateral foreign assistance

Figure 1

CONCEPTUAL FRAMEWORK AND ANALYTICAL TECHNIQUES
FOR INTEGRATED SPATIAL ANALYSIS & PLANNING

TYPES OF ANALYSIS	ELEMENTS OF ANALYSIS	APPROPRIATE METHODOLOGY	NECESSARY DATA
Analysis of Rural Resources and Activities	1. Physical Characteristics, Land and Resource Use 2. Cropping Patterns 3. Volume and Diversity of Agricultural Productivity 4. Population Distribution and Human Settlement Patterns 5. Services and Facilities Distribution 6. Nonagricultural Commercial and Manufacturing Activities 7. Subsistence Systems Characteristics and Patterns	-Aerial Photography and Mapping Analysis -Special Mapping -Descriptive Statistics -Location Analysis -Descriptive Mapping	-Land Tenure Information -Soil and Water Resources -Mineral, Forestry, and Fisheries Resources -Location and Types of Rural Roads -Livestock Resources -Types, Location and Uses of Water Resources -Population Census -Types and Location of Agro-Industries -Climate and Weather Conditions -Size and Distribution of Farms and Landholdings -Crop Yields -Value of Marketed Crops -Types and Location of Agricultural Processing Activities -Types and Location of Storage Facilities -Types and Locations of Marketing Facilities -Size and Distribution of Farm Income
Analysis of Development Centers	1. Location of Market Centers, Towns, Small and Middle Cities 2. Size, Composition, Density, and Distribution of Population 3. Location, Concentration and Dispersion of Major Social and Economic Activities 4. Changes in Size and Concentration of Activities over Time 5. Labor Force Characteristics 6. Location and Distribution of Public Services and Facilities	-Descriptive Statistics -Scalogram Analysis -Guttman Scale Analysis -Coefficients of Concentration -Coefficients of Deviation -Location Quotients -Coefficients of Localization -Localization Curves and Ratios -Indices of Segregation -Indices of Dissimilarity -Shift-Share Analysis -Gap Analysis -Special and Descriptive Mapping -Factor Analysis	-Population Size and Density -Population Characteristics -Land Areas and Land Uses -Distance to Major Metropolitan Centers -Type, Size, Location of Public Facilities and Services -Types and Location of Utilities -Characteristics of Transport Services and Facilities -Size, Location and Characteristics of Commercial Establishments -Health Facilities and Services Characteristics -Recreational Facilities -Governmental Services and Facilities Characteristics -Type and Location of Social Organizations -Employment Sources -Characteristics of Educational Institutions -Professional Services -Manufacturing and Processing Industry Characteristics -Size, Location and Volume of Business for Personal Services Establishments -Educational Levels of the Population

Best Available Document

Analysis of Regional Spatial Linkages	1. Physical Linkages: a. Road Networks b. River and Water Transport Channels c. Rail Networks d. Ecological Interdependencies 2. Economic Linkages: a. Market Patterns b. Raw Materials and Intermediate Goods Flows c. Capital Flows d. Production Linkages--Backward, Forward, and Lateral e. Consumption and Shopping Patterns f. Income Flows g. Sectoral and Inter-Regional Commodity Flows h. "Cross Linkages" 3. Population Movement Linkages: a. Migration--Temporary and Permanent b. Journey to Work 4. Technological Linkages: a. Technology Interdependencies b. Irrigation Systems c. Telecommunications 5. Social Interaction Linkages: a. Visiting Patterns b. Kinship Patterns c. Rites, Rituals and Religious Activity d. Social Group Interaction 6. Service Delivery Linkages: a. Energy Flows and Networks b. Credit and Financial Institutions c. Education, Training, Extension Links d. Health Service Delivery Systems e. Professional, Technical Comsercial Service Patterns f. Transport Service Systems 7. Political, Administrative, and Organizational Linkages: a. Structural Relationships b. Government Budget Flows c. Organizational Interdependencies d. Authority-Approval-Supervision Patterns e. Inter-Jurisdictional Transaction Patterns f. Informal Political Decision Chains	-Trade Area Analysis -Input-Output Analysis -Environmental Impact Analysis -Regional Balance of Payments Analysis -Correlation -Factor Analysis -Linear Programming -Network Analysis -Activity Analysis -Differential Migration Analysis -Inflow-Outflow Analysis -Origin-Destination Studies -Gravity and Potential Models -Survey Research -Key Informant Analysis -Case Studies -Descriptive and Special Mapping -Transaction Analysis -Descriptive Statistics -Simple and Multiple Regression	-Number, Size, Location and Quality of Road and Rail Lines -Soil Conditions, Water and Air Pollution Levels -Shipping Times to Major Central Places -Transport Service Costs -Types, Sources and Locations of Raw Material Supplies -Size, Type and Location of Regional Industries -Retail Sales Trends -Residential Location of Employed Workers -Employment Commuting Distances -Value Added in Manufacturing by Location and Industry -Consumer Characteristics -Size, Types and Location of Regional Shopping Facilities -Regional Income Size and Distribution -Types, Sizes and Locations of Communications Media -Time Deposits and other Savings -Volume and Distribution of Investment, by Location and Activity -Changes in Natality, Morbidity and Mortality Rates -Family and Kinship Patterns -Work Structure and Organization Data -Types and Locations of Religious Groups -Types and Location of Social and Professional Groups -Energy Use and Distribution -Volume and Distribution of Credit and Loans -Structure of Governments Within Region -Types, Location and Distribution of Formal Government Responsibilities -Types and Distribution of Government Offices and Facilities -Intergovernmental Financial Transfers -Types, Sources and Distribution of Government Revenues -Allocation of National Provincial and Local Budget Resources -Licencing and Regulatory Powers -Types, Location and Responsibilities of Autonomous Authorities within the Region -Types, Location and Functions of Quasi-Public Organizations

Source: Dennis Rondinelli and Kenneth Ruddle, Urban Functions in Rural Development: An Analysis of Integrated Spatial Development Policy, Table 16.

agencies, would be coordinating the location of substantial investments in the Basin in the immediate future. The interest of the USAID Mission in the Philippines, and the cooperation of the Philippine government in providing support, were also primary considerations in the selection.

The Bicol River Basin Urban Functions in Rural Development Project began in November 1976 with a three-phased work plan:

Phase I: Assessment of Rural and Urban Spatial Systems: a preliminary inventory, collection and review of available data would be made, both to determine the quantity and quality of data already collected through government studies or special analysis and to assess the need for additional data collection and special studies. As much descriptive analysis as possible would be done using existing data, and new data collection would be kept to the minimum consistentwith the need to do a comprehensive and valid spatial analysis of the Basin. Preliminary data would be used to judge the extent to which a hierarchy of central places existed in the Basin and the degree to which they served rural areas, and to determine the characteristics and functions of central places. The existing data would be supplemented by small original research studies and the following types of information would be gathered to create a profile of municipalities and settlements within the Basin: 1) population distribution and migration; 2) commodity flows within the Basin and among major external markets; 3) transport facilities and access; 4) topography and land use; 5) soil capability and characteristics; 6) cropping patterns and productivity levels; 7) municipal services and facilities; 8) market patterns for selected nonagricultural commodities; 9) water resources and irrigation systems; 10) distribution of manufacturing and commercial activities; 11) employment and income patterns; 12) distribution and characteristics of ecological or natural resource areas. Other data would be added as their availability and relevance were established during the study period. Prior to completion of Phase I, a workshop on spatial analysis methodologies would be conducted by the project staff and USAID consultants for local, provincial, national ministry and Bicol River Basin Development Program (BRBDP) staff involved in the project.

Phase II: Identification and Analysis of Rural-Urban Linkages: Following analysis of the existing spatial system, a second phase of the project would identify and analyze the major linkages between rural and

urban areas. Physical, economic, social, political, and institutional linkages would be identified, described, and evaluated in terms of two major sets of criteria--the degree to which the existing spatial system facilitates the distribution of urban services and facilities in rural areas in support of rural development, and the degree to which linkages integrate urban centers and rural areas in an articulated spatial network of production, consumption and exchange that promotes economic growth and productive activity in the Basin. Both growth and equity criteria were to be taken into consideration. Again, prior to the completion of this phase, a workshop would be conducted to disseminate analytical methodology and obtain "feedback" and response from professionals working in the Basin.

Phase III: Plan Formulation: From the analysis of the existing spatial system, the current state of social and economic development in the Basin, the degree of articulation of linkages between rural areas and central places, the project staff would identify "gaps" in urban services and facilities needed to serve rural areas, linkages that must be created between urban and rural areas to form an articulated spatial system that could promote economic growth in an equitable manner, and programs and projects required to achieve rural development goals. The staff would review the development objectives of the BRBDP, propose a conceptual plan for human settlements development and the location of supportive services in the Basin to achieve those goals, make proposals and recommendations for programs and projects that would create a spatial system conducive to rural development, and provide an analysis of spatial development in the Bicol that would be useful to various government agencies, local and provincial governments and the BRBDP in locating future facilities and services investment.

The 16-month project would be designed and implemented by a Philippine staff hired through the BRBDP and responsible to it. Indigenous design and implementation was important for two reasons: first, although the Bicol had a relatively large data base for analysis, much of the crucial information would not be available in the forms needed and gaps in statistics were expected, requiring the knowledge and experience of local planners to supplement statistical analysis and to interpret results; and second, the planning process was to be institutionalized in the Bicol River Basin Development Program, thus requiring that its staff and consultant be intimately involved in the entire study. Project design assistance,technical aid in selecting and adapting methodology, review and evaluation of working papers

and the final study, and assistance with training would be provided by USAID consultants, who would also monitor and evaluate progress for the Office of Urban Development. The consultants would be available at regular intervals during the project, but would not reside full-time in the Philippines. Primary responsibility for all phases, and for completion of the project, was vested in the Philippine staff.

THE SETTLEMENT SYSTEM AND DISTRIBUTION OF FUNCTIONS IN THE BICOL RIVER BASIN: SUMMARY OF FINDINGS

The Bicol River Basin is an economically depressed area in the southern Luzon region of the Philippines. It consists of two provinces (Albay and Camarines Sur) with 706,000 hectares of land, about half of which are arable, and nearly 1,800,000 people. For decades the Bicol River Basin has experienced high levels of rural poverty, owing to the predominance of a subsistence agricultural economy that perpetuates chronic underemployment, serious malnutrition and high levels of outmigration. Over 80 percent of the population had incomes below the national poverty level of $114 percapita in 1971. In 1975, nearly 90 percent of the Basin's families had annual incomes below the poverty threshold and nearly 65 percent had incomes of less than half of the poverty mark, classifying them as the "poorest of the poor." About 28 percent of the labor force is either unemployed or underemployed and nonagricultural job opportunities in the Basin's towns and rural villages are limited. Income levels of the Bicol River Basin's population are not only low, but income and wealth are seriously maldistributed. Ten percent of the households in the Basin receive 43 percent of total income, and the poorer 50 percent of the population receives only 13 percent of income. The poorer half lives on about $45 per capita a year, only enough to buy rice, occasionally some fish, and the barest necessities of life.

Standards of living in the Basin are far below those of the Philippines. Although few want for food and outright starvation is not characteristic of the area, nearly 80 percent of preschool children suffer from serious malnutrition. A majority of the population is inflicted with water-borne enteric diseases and intestinal parasitism, resulting from contaminated water supplies and poor environmental sanitation. Nearly 73 of every thousand infants born in the Bicol River Basin die during their first year, primarily of pneumonia, gastrointritis and bronchitis. There is only one physician for every 4,600 people and most of the doctors are located in larger towns, inaccessible to rural prople. Surveys estimate that no more than one-quarter of all women living in the Basin have ever visited a health clinic, hospital or family planning center; most rural families seek assistance from healots, herb purvayors or midwives during pregnancy or illness. Housing conditions outside of the larger towns are also poor. In rural areas homes are built of scrapwood and nipa, with

Table 1

REGIONAL POVERTY THRESHOLD AND INCOME LEVELS, PHILIPPINES
1971 and 1975

Region	Number of Families (In thousands)		Average Family Income (In Pesos)		Families with Income Below Food Threshold, 1971		Families with Income Below Poverty Threshold, 1971	
	1971	1975	1971	1975	Number (000s)	Percent	Number (000s)	Percent
ILOCOS	346	558	3,299	5,525	213	72.6	447	85.2
CAGAYAN VALLEY	260	329	2,390	5,102	231	75.8	293	84.8
CENTRAL LUZON	855	662	4,127	5,773	224	36.5	178	68.5
SOUTHERN TAGALOG	869	888	4,332	5,441	436	30.6	466	54.5
BICOL	496	518	2,784	4,280	351	70.9	759	87.3
WESTERN VISAYAS	670	679	3,206	5,484	418	65.3	419	84.5
CENTRAL VISAYAS	980	441	2,548	4,834	388	70.7	572	85.4
EASTERN VISAYAS	NA	595	NA	5,172	718	73.3	847	86.4
WESTERN MINDANAO	522	370	3,062	3,803	NA	NA	NA	NA
NORTHERN MINDANAO	825	433	3,577	6,307	339	65.1	449	86.1
SOUTHERN MINDANAO	NA	314	NA	5,662	480	58.3	654	79.8
CENTRAL MINDANAO	NA	301	NA	5,025	NA	NA	NA	NA
MANILA AND SUBURBS	525	770	7,785	10,469	128	24.7	NA	NA
THE PHILIPPINES	6,347	6,859	3,736	5,840	3,774	59.0	5,039	79.4

Sources: National Census and Statistics Office, Special Release No. 190, and National Economic and Development Authority, Statistical Yearbook, 1975, Manila: NEDA, 1975.

Table 1-A

REGIONAL DISTRIBUTION OF SELECTED SOCIAL AND ECONOMIC INDICATORS
THE PHILIPPINES

REGION	% Total Population	Density population /sq. km.	Literacy	Hospital Bed per 10,000 people	Car per 100 Households	%Household with radio	% Total Primary Students	% Total Vocational, Intermediate and Secondary Students	% Total College/ University Students	1970 % Total Gross Wholesale Trade	1970 % Total Gross Retail Trade	Average Monthly Income of Retail Industry ($1,000)	% Urban Population
I. Ilocos	8.2	134.2	79.1	11.1	6.9	46.4	7.8	9.6	2.1	3.8	6.0	50.8	16.0
II. Cagayan	4.6	44.6	77.5	17.5	6.8	51.2	3.8	3.2	3.3	1.2	2.5	30.7	9.0
III. Central Luzon	10.1	220.5	90.5	5.4	17.7	66.4	10.9	11.9	3.5	2.2	8.4	41.8	27.5
IV. Southern Tagalog	22.7	3,440.1	89.0	14.4	16.4	50.9	20.0	28.7	81.2	65.4	44.6	98.7	59.0
V. Bicol	8.1	166.1	86.8	5.4	3.4	35.1	10.4	8.6	8.2	3.6	2.6	29.5	15.5
VI. Western Visayas	9.9	163.7	80.2	7.7	7.1	41.9	7.8	7.2	2.0	3.2	4.9	39.9	73.0
VII. Central Visayas	8.3	204.2	77.5	7.7	9.8	41.1	7.6	5.8	0.4	6.6	6.7	45.2	24.0
VIII. Eastern Visayas	6.5	110.3	65.4	7.8	4.9	28.7	7.5	5.5	1.0	2.1	4.4	36.0	12.3
IX. Western Mindanao	5.1	110.0	62.3	3.5	3.7	28.7	5.5	3.5	1.1	1.9	4.3	63.8	13.6
X. Northern Mindanao	8.2	108.4	81.2	6.2	6.7	42.9	9.3	7.4	2.1	3.5	5.3	45.4	11.7
XI. Southern Mindanao	8.4	71.9	78.0	6.0	8.6	47.2	7.4	6.7	2.9	3.4	10.1	73.5	20.2

Source: Philippine Yearbook 1975, National Economic and Development Authority and National Census and Statistics Office, Philippines (1975).

nipa or grass roofs and bamboo or dirt floors. Less than one-third of the Basin's households have adequate water supplies or sanitary toilets. Sounder structures, more typical of the towns, are scattered in rural barangays, but the overwhelming majority of houses throughout the Basin are constructed of weak building materials and are highly subject to fire, flooding or destruction during typhoons. Few homes are served by piped water or electricity; in the vast majority kerosene or wood is used for lighting and cooking.

The population growth rate of 3.3 percent a year results in a high dependency ratio--nearly half of the population is under 14 years old--and more than one percent of the population migrates out of the Basin each year. Most migrants are younger, more productive people seeking job opportunities in larger towns outside the Basin, and usually in Metropolitan Manila. The Bicol Region, of which the Basin is a part, has had the lowest net domestic product (NDP) in the Philippines over the past decade, which declined in real terms by an average of 1.5 percent between 1972 and 1974, at a time when the national average was growing by nearly four percent. The Bicol Region in the early 1970s had the lowest share of employment and production among all regions in the Philippines as well as the lowest proportion of modern manufacturing establishments to population in the country. Indeed, the only industrial capacity in the Basin takes the form of small agro-processing and cottage industries, primarily family-owned and operated. Nearly all manufactured goods sold in Bicol are imported from Manila.

Ironically, most Bicolanos live in poverty in a land of great natural beauty and abundant natural resources. It is estimated that if the rich alluvial soil, deposited by centuries of volcanic eruptions, was properly irrigated and cultivated, the Basin could produce enough rice to sustain an additional 8 million people. Production of corn, abaca, sugar, coconuts and vegetables is only a fraction of its potential under favorable conditions. The Bicol also has a wealth of untapped mineral resources--about 30 percent of marble deposits, 75 percent of perlite and about 20 percent of the coal reserves of the Philippines. The Tiwi Geothermal plant, located on the Basin's northeastern border, will soon generate up to 100 megawatts of relatively cheap energy.

But as a subregional economy, the Bicol River Basin currently is poorly equipped for increased productivity and widespread development. Through much of the year the

Basin is battered by frequent typhoons, bringing high winds and heavy rains. The perennial flooding destroys crops and homes, pushes saline water into interior rice fields and causes widespread silting and erosion. The area is physically isolated from the rest of the Philippines during the worst of the typhoon season and poorly linked to other regions or to Manila even during good weather. A single paved highway through the central Luzon penninsula connects Bicol to Manila, weaving tortuously through the mountains. During the typhoon season even this link becomes tenuous as sections of the road are washed out and collapse down the side of steep mountain banks. Daily flights to and from Manila carry mostly businessmen, government officials and foreign technical assistance experts; daily buses and one railway provide limited capacity for travel or interregional communications, and small ports in coastal villages provide limited access for inter-island trade. Regional transportation and communications are not much better, limiting travel and marketing, and leaving the Basin's settlement system a scattering of relatively isolated and poorly integrated clusters of villages.

Nor are current land tenure arrangements conducive to increasing family incomes. Farm holdings are small and fragmented. From a third to half of all rice and corn farmers work as tenants or landless laborers, and farm productivity is nearly 10 percent lower than that of the Philippines. Owners of large landed estates have reinvested little of their profits in the Basin over the years, and agricultural technology on both large and small farms is primitive. Manpower and draft animals provide the bulk of agricultural labor. Relatively few milling or processing facilities have been established, marketing networks in rural areas are poor and storage capacity is limited. Because productivity and income are so low, both tenants and small landowners are continuously in debt. Whatever small surpluses they accumulate are quickly spent on baptisms, weddings, funerals, children's schooling and the annual fiesta, and on repaying former loans. Only about half of the Basin's 100,000 hectares of potentially irrigable ricelands are irrigated; nearly 50,000 hectares of prime agricultural land is flooded during the typhoon season and that located adjacent to the Bicol River suffers from saline intrusion.

Because of its large size, rich potential and severe poverty, both the national government and international assistance agencies have taken a strong interest in the Basin's development. The Bicol River Basin Development Program (BRBDP) and a Bicol River Basin Council

(BRBC) were established by Executive Order 412 in 1973 and amended by Presidential Decree 926 in 1976 to: (1) promote integrated development of agriculture, natural resources, infrastructure and social services; (2) adopt an integrated rural development program for the Basin; (3) provide comprehensive and decentralized management and planning within regional and national development goals; (4) integrate national and local programs and projects within the Basin; and (5) decentralize planning and implementation of development projects.

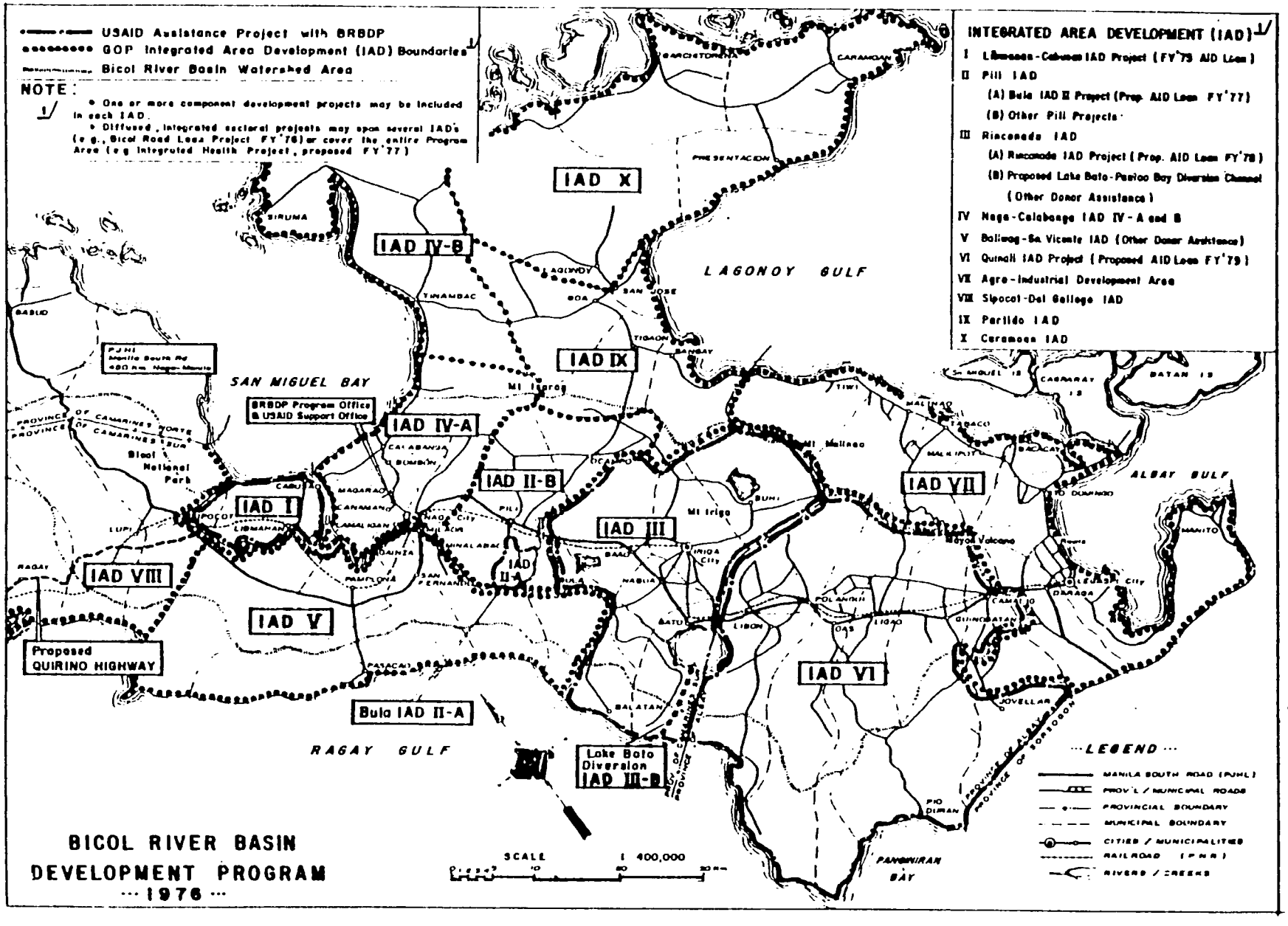
The BRBDP is under the jurisdiction of the Secretary of Public Works and is directed by a coordinating committee composed of 16 regional directors of national ministries and agencies operating within the Basin, the governors of Albay and Camarines Sur Provinces and the executive director of the BRBDP. The program is advised by a private committee of businessmen, farmers, representatives of religious groups and the media, and civic leaders. To facilitate local planning and program implementation, the Basin is divided into Integrated Area Development (IAD) units, each with a development team headed by a municipal mayor and consisting of local government officials, technical personnel of national ministries and line agencies working in the Basin, and community leaders (see Figure 2). These area development teams (ADTs) are assisted with planning and technical tasks by BRBDP personnel.

Development planning, technical studies and projects have been heavily funded by grants and loans from the U.S. Agency for International Development in amounts about equal to those provided by the Government of the Philippines. Thusfar, two major capital construction projects in irrigation and secondary and feeder roads have been undertaken and comprehensive studies of water resources, land classification, intermodal transport and hydrometeorology have been completed. Feasibility studies for agricultural education, health and nutrition and population, crop production and compact farm development projects are underway; an agribusiness reconnaisance survey, rural industries studies and farm-to-market road construction programs are planned. In addition to USAID, the World Bank, Asian Development Bank, and the governments of France, Germany, and Japan have expressed interest in assisting with projects identified in the Bicol Comprehensive Development Plan.

Thus, a spatial analysis of the Bicol River Basin, through the Urban Functions in Rural Development Project, came at

Figure 2

MAP OF BICOL RIVER BASIN AND INTEGRATED AREA DEVELOPMENT BOUNDARIES



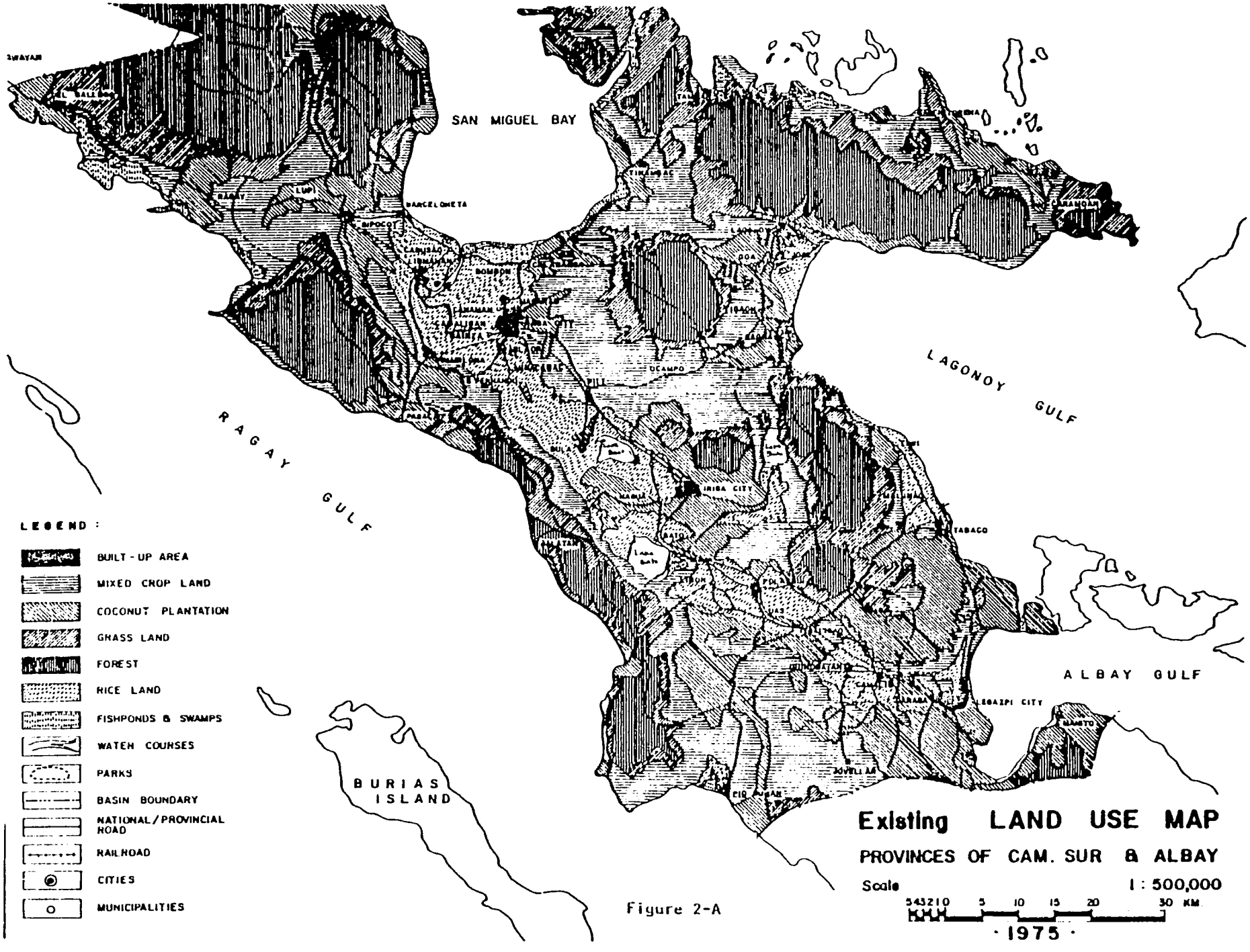

SAN MIGUEL BAY
LAGONOY GULF
RAGAY GULF
ALBAY GULF
BURIAS ISLAND
BARCELONETA
BIPOCOT
CAMPAO
BOMBON
CAMALIGAN
NAGA CITY
PILI
OCAMPO
IRIGA CITY
TABACO
LEGAZPI CITY
MANITO
LIBMANAN
LUPI
GARANGAN
TIGAON
DOA
BULA
PASACAO
CIB AMAR
Existing LAND USE MAP
PROVINCES OF CAM. SUR & ALBAY
Scale 1 : 500,000
543210 5 10 15 20 30 KM
· 1975 ·
LEGEND :
BUILT - UP AREA
MIXED CROP LAND
COCONUT PLANTATION
GRASS LAND
FOREST
RICE LAND
FISHPONDS & SWAMPS
WATER COURSES
PARKS
BASIN BOUNDARY
NATIONAL / PROVINCIAL ROAD
RAILROAD
CITIES
MUNICIPALITIES

Figure 2-A

a time when macro-analytical studies had been completed and prior to a period of intensive investment in infrastructure, social services and directly productive activities. The spatial analysis concentrated on three major elements: socio-economic, demographic and physical characteristics of municipalities; functional complexity, spatial distribution and economic characteristics of human settlements; and spatial linkages among municipalities and settlements within the Basin.

Socio-Economic Profile of Municipalities

The Bicol River Basin includes 54 municipalities in Camarines Sur and Albay Provinces, including three small cities of Naga, Legaspi and Iriga, which are the most economically diversified settlements within the area. Municipalities are administrative units in the Philippines, composed of a town center called a poblacion and smaller villages known as barrios or barangays. Municipalities in Bicol are generally small in size, averaging a little more than 30,000 people or about 5,200 households. The municipalities are subdivided into 1,534 barangays, some of which are discrete villages and others are scattered clusters of houses or proximate dwellings with no communal core. The number of barangays in the municipalities range from 6 to 75, with an average population size of a little more than 1,000 each. Only about 13 percent of the barangays are classified by the Philippine census as "urban" and they are generally the municipal poblacions. The urban barangays contain only about 18 percent of the Basin's total population.

Although the entire Bicol River Basin is predominantly rural, municipalities differ in their socio-economic, demographic and physical characteristics. Services, facilities, infrastructure and economic and social organizations are unequally distributed among municipalities. If socio-economic variables are used as indicators of levels of development, municipalities in the Basin could be classified into three major levels:

1. Developing municipalities include the six most "urbanized" units, which form the two provincial centers of Naga-Camaligan and Legaspi-Daraga, the city of Iriga and the town of Tabaco. Services, facilities, and economically productive activities are highly concentrated in these six municipalities, with the highest concentrations in Naga and Legaspi cities. These six municipalities contain about one-quarter of the

total population (386,000 people or 22 percent) but account for more than 40 percent of the "urban" population. Average literacy rates in these municipalities are about 87 percent. Moreover, these half dozen municipalities account for 45 percent of all municipal government revenues collected in the Basin. Significantly higher percentages of households are served by piped water and electricity; most of the Basin's educational and vocational training institutions are concentrated within these areas, and many of the major health care institutions are located within their boundaries. People within these municipalities are more highly educated. The developing municipalities contain nearly a third of all high school and 45 percent of all college graduates. These six municipalities are the financial centers of the Basin, containing nearly half of all financial institutions, with more than 85 percent of deposit and loan assets. More than one-third of all corn mills, agricultural warehouses, farm supply stores and farm machine and tool establishments, and nearly half of the cottage industries, commercial, financial and service establishments are within their boundaries. (See Table 2 and Figure 2.)

2. Less Developed Municipalities are ten that lie at or near the Manila South Road within the central plain of the river basin. They are closer in socioeconomic and physical characteristics to the underdeveloped municipalities than to the developing ones, but they are distinguished from the former primarily by the fact that their access to roads has generated some diversification of economic and social activities within their poblacions and that they contain the potentially richest agricultural land within the Basin. All are either linked by the Manila South Road to the major cities of Naga and Legaspi or by provincial arterials to the Manila South Road. This group of municipalities accounts for slightly more than one-quarter of the Basin's population (456,000 or 26 percent). The less developed municipalities average less than 4,000 "urban" residents, and the only urbanized sections are the poblacions. The characteristics of the rural areas of these municipalities are not much different than those of the underdeveloped sections of the Basin: less than 20 percent of their households are served by piped water, they have far fewer educational or health institutions and commercial establishments than the developing municipalities, and fewer cottage industries. Perhaps because of their physical proximity to the major provincial centers in the developing municipalities, these areas have not become highly specialized and seem to depend on the

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Table 2

DISTRIBUTION OF SOCIO-ECONOMIC INDICATORS AMONG MUNICIPALITIES, BY LEVEL OF DEVELOPMENT, 1970

Indicator	Developing Municipalities (N=6)	Less Developed Municipalities (N=10)	Underdeveloped Municipalities (N=38)
Population	22.4%	26.4%	51.2%
Educational Attainment			
High School Graduates	31.2	26.3	42.4
College Graduates	44.8	23.2	32.0
Dwelling Units of Strong Construction	32.6	26.9	40.4
Municipal Revenues	44.5	18.6	36.9
Average Share of Municipal Revenues from National or Other External Sources	14.6	25.7	32.8
Financial Institutions	48.1	13.4	38.2
Deposit and Loan Assets of Financial Institutions	86.9	4.7	8.4
Agro-Processing, Storage & Commercial Establishments	24.9	31.4	36.7
Rice Mills	16.8	32.8	50.4
Corn Mills	31.0	32.8	36.2
Warehouses	36.5	33.0	30.4
Agro-Supply Stores	41.7	30.6	27.7
Farm Machine and Tool Stores	64.5	9.7	25.8
Manufacturing, Commercial, Financial and Service Establishments	45.4	29.8	24.8
Cottage Industry	25.9	29.7	44.4
Wholesale and Retail	28.9	24.4	46.7
Transport, Storage and Communications	34.2	29.5	36.3
Finance, Real Estate, and Business Services	50.0	25.8	24.2
Community, Social and Personal Services	45.5	29.8	24.8
Health Facilities--Hospitals	51.2	25.5	23.3
Hospital Beds	58.9	11.7	29.3
Communications Facilities 1/	25.6	21.8	52.5

Source: Government of the Philippines, National Census and Statistical Office, 1970.

1/ Includes Radio, Television, Postal, Telegraph, Telegram, Postal and Telephone Stations or Offices.

larger centers for marketing and trade activities. They have concentrations of services, facilities, manufacturing establishments, commercial activities, and infrastructure slightly larger than their share of population.

3. Underdeveloped Municipalities include 38 predominantly rural, subsistence agricultural areas forming the periphery of the Basin. Slightly more than half of the population of the Bicol River Basin lives in these municipalities, which, by all socio-economic characteristics, are the poorest and least developed. These 38 municipalities have a far smaller proportion of facilities, services, educated manpower, financial resources, and productive economic activities than their share of population. Their residents are scattered in rather small barangays. Only eight percent of households receive water and less than six percent have electrical power. Only five of the 38 municipalities have post-secondary educational or vocational training institutions; nearly 40 percent have no markets of any kind, and 8 contain no financial institutions. These municipalities collect less than two-fifths of all municipal revenues and, on the average, depend on the national government for nearly a third of their municipal income. Some of the municipalities, such as Del Gallego, Minalabac, and Presentacion, obtain more than half of their revenues from the national government and have few sources of internal income. The financial institutions in these underdeveloped municipalities have less than 10 percent of the deposit and loan assets in the Basin. As a group, these municipalities contain less than one-quarter of the manufacturing, commercial, financial and service establishments, only a little more than a third of agro-processing, storage and commercial establishments and one-fourth of the health facilities.

Thus, a majority of the population in the Bicol River Basin lives in municipalities with few services or facilities needed to meet basic human needs or to increase agricultural production and expand nonagricultural employment opportunities. Moreover, they are generally isolated from or have extremely poor access to the municipalities in which services, facilities and markets are most highly concentrated.

Indeed, transport linkage and physical access seem to be key variables explaining much of the differentiation among municipalities in the Bicol River Basin. Less than a third (15) of all municipalities are served by

the all-weather, concrete Manila South Road--and these are developing and less developed municipalities. Less than half (21) of the municipalities have even asphalt provincial roads, which are often in poor condition and sometimes impassable during the rainy season. Nearly a third of the municipalities are accessible only by unsurfaced earth or gravel paths, which are impassable or difficult to traverse during much of the year, by infrequent rail service or by water transport. Municipalities along the Manila South Road tend to have relatively larger populations, the highest concentration of services, facilities and economic activities, and the largest proportion of "urban" residents. The barangays that have grown the largest in size and in diversity of economic activities are in municipalities along the Manila South Road and most are poblacions along or at junctions of the provincial and national roads. Levels of development decline and levels of poverty increase in areas located farther from the Manila South Road. Nearly all of the regular markets are found in those municipalities that are linked by roads, and the frequency of markets declines with distance from passable arteries.

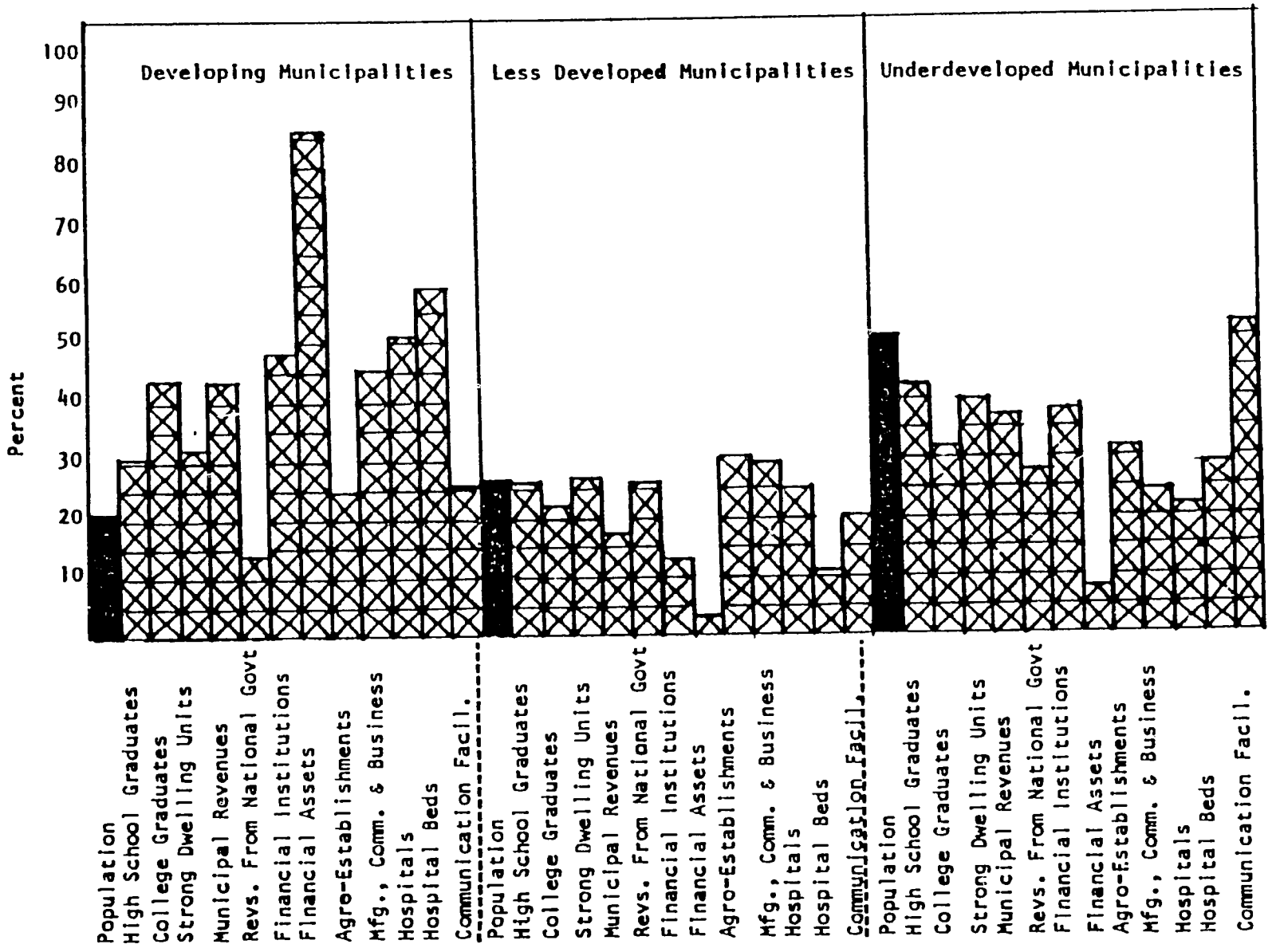
Distribution of Functions and Functional Complexity of Settlements

Services and facilities necessary for serving basic human needs and generating economic development for the rural poor are not only inadequate in the Bicol River Basin, but are also highly concentrated in a few small central places, which are not easily accessible to people living outside of their immediate boundaries. The hierarchical distribution of settlements is strongly skewed and the spatial system is neither well-articulated nor tightly integrated. Central places of different sizes, performing distinct and specialized functions needed for urban and rural development, are neither numerous nor well-distributed throughout the Basin. Almost all services and facilities of consequence to rural development are concentrated in a few poblacions and cities, and most of these are clustered along the national highway that cuts through the center of the Basin to produce the ribbon of relatively higher level development. A large majority of the rural areas are inaccessible to these centers and unserved by central functions.

Sixty-four major functions--services, facilities and organizations that contribute to spatial centrality

Figure 3

DISTRIBUTION OF SOCIO-ECONOMIC INDICATORS AND POPULATION BY CATEGORIES OF MUNICIPALITIES



or that indicate functional complexity--were inventoried and scaled in order to determine the functional hierarchy of settlements and to analyze the composition, characteristics, and distribution of "urban" functions performed by communities of various size. Of the 1,419 discrete settlements within the Bicol River Basin --composed of 120 "built-up" areas (poblacions and contiguous barrios) and more than 1200 barangays--little more than half contained any of the functions. Nearly 90 percent of all functions appeared in less than 20 percent of the settlements.

This highly skewed pattern, in which more than 40% of the settlements are unserved by any function of economic or developmental significance, includes many settlements with only a few very localized social or civic activities. The most ubiquitous of the 64 functions--farmers associations, agro-processing facilities (small rice and corn mills or storage sheds), cottage industries and civic associations--are the most primitive of economic institutions, and even these are only found in slightly more than half of all settlements. Most of the other functions that appear in more than 20% of the settlements are either highly localized services, or social organizations with little or no productive activity.

Nearly all services and facilities that could potentially contribute to rural development are usually found in poblacions or municipal centers. But even among these "built up areas," functions are unevenly distributed. Nearly 60% of all central functions appear in less than 20% of the built up areas. More than 20% of these places contain none of the central functions.

The functional analysis was used in conjunction with centrality indexes, threshold analysis, and secondary socio-economic, demographic and physical data to construct a "hierarchy" of settlements in the Bicol River Basin. The skewed hierarchy of settlements reflects the distribution of functions. Based on functional complexity, only two central places--the Naga-Camaligan and the Legaspi-Daraga areas--contained most of the functions found in settlements in the Basin. These two places represent less than one percent of all communities, and contain about 10% of the Bicol's population.

The Naga and Legaspi centers perform primarily commercial marketing and administrative functions, serving portions of the provinces in which they are located. They contain the two largest markets in the Basin, through which selected agricultural commodities are exported to Manila and nearby areas and through which

Table 3

DISTRIBUTION OF FUNCTIONS AMONG SETTLEMENTS, BICOL RIVER BASIN

Function	Number of Settlements With Function	Percent of Settlements With Function	Percent of Basin Population Living in Settlements With Function	Number of Built-Up Areas With Function	Percent of Built-Up Areas With Function
Farmers Association	583	41.1	36.5	89	74.2
Agro-Processing Facility	410	48.9	31.7	91	75.8
Cottage Industry	379	26.7	25.7	74	61.7
Civic Organization	379	26.7	25.7	74	61.7
Sports Association	193	13.6	34.7	54	45.0
Paved Basketball Court	191	13.5	36.9	63	52.5
Piped Water Supply System	178	12.5	30.8	44	36.7
High School	111	7.8	32.5	62	51.7
Ag. Extension Station (BAex)	87	6.1	29.1	54	45.0
Photo Studio	68	4.8	27.5	50	41.7
Bureau of Plant Industries Ext.	61	4.3	29.1	50	41.7
DLGCD (Ministry of Local Govt.) Office	58	4.1	26.7	55	45.8
Professional Organization	58	4.1	27.6	31	25.8
Auto Repair Shop	55	3.9	23.4	33	27.5
Bureau of Animal Industries Extension Station	55	3.9	25.9	44	36.7
Private Medical Clinic	54	3.8	26.4	38	31.7
Cockfighting Pit (Regular)	51	3.6	24.1	34	28.3
Farm Supply-Agro-Chemical Store	48	3.4	24.3	35	29.2
Construction Supply Store	48	3.4	23.7	30	25.0
Regular Public Market	46	3.2	24.2	33	27.5
Hardware Supply Store	44	3.1	23.7	29	24.2
Farm Equip. Repair Facility	42	2.9	21.9	27	22.5
Playground with Facilities	42	2.9	21.3	31	25.8
Rural Bank	41	2.8	24.7	36	30.0
Housing Subdivision	40	2.8	20.6	20	16.7

Labor Union	32	2.3	20.3	27	22.5
Cooperative	31	2.2	18.2	20	16.7
Drugstore	30	1.8	20.7	30	25.0
PC (Constabulary) Station	30	1.8	9.1	17	14.2
Restaurant	27	1.9	20.6	22	18.3
Credit Union	26	1.8	19.1	24	20.0
Nightclub or Bar	25	1.7	18.1	12	10.0
Train Station	25	1.7	18.7	17	14.2
Surveyor	24	1.7	20.0	22	18.3
Appliance Store	23	1.6	19.7	19	15.8
Gymnasium/Auditorium	23	1.6	14.1	9	7.5
Bus Station with Repair Fac.	22	1.5	16.5	10	8.3
Private Hospital	22	1.5	19.5	10	8.3
Vocational School	19	1.3	17.1	15	12.5
Lodging Place	19	1.3	16.9	14	11.7
Power Plant or Station	18	1.2	16.3	13	10.8
Telecommunications Station	16	1.1	16.5	14	11.7
Bank or Financial Establishment	16	1.1	17.7	10	8.3
College	15	1.1	16.4	8	6.7
Optometry/Optical Shop	15	1.1	18.1	13	10.8
Funeral Parlor	14	1.0	17.4	13	10.8
Telephone Exchange	13	.9	15.9	8	6.7
Xerox Copy Service	13	.9	16.7	8	6.7
Cinema with Daily Run	12	.8	15.[illegible]	8	6.7
Paluwagen (Welfare Society)	11	.7	8.3	9	7.5
Operational Govt. Hospital	11	.7	12.7	8	6.7
Fire Station with Trucks	10	.7	16.3	9	7.5
Cinema, Less than Daily Run	10	.7	13.2	10	8.3
Shopping Center	9	.6	16.0	7	5.8
Cemetary (Memorial Park)	8	.6	9.1	4	3.3
Port or Pier	7	.5	6.9	3	2.5
Radio Station	6	.4	14.9	4	3.3
Nursing School	6	.4	13.8	3	2.5
Newspaper Publication	5	.3	13.5	3	2.5
Security Agency	4	.3	1[illegible].5	4	3.3
Hotel	4	.3	13.4	4	3.3
Red Cross Station	3	.2	10.8	2	1.7
Bowling Alley	3	.2	13.3	3	2.5
Airport	2	.1	10.9	1	1.7

nearly all of the Basin's manufactured goods are imported from Manila. Nearly all periodic markets in the Basin with any external trade linkages deal, directly or indirectly, through these two major markets. Trade linkages between these central markets and others within the Basin, however, seem to be both highly selective and sporadic, and do not provide an institutionalized exchange network needed to stimulate agricultural productivity in the rural hinterlands. Naga and Legaspi contain most of the higher level communications, economic, recreational, administrative and marketing functions found in the Basin. Even they, however, perform few secondary economic (industrial or manufacturing) activities and offer no significant basis for inter-regional trade.

At a second level are 11 settlements--Iriga, Tabaco, Goa, Guinobatan, Tigaon, Pili, Nabua, Baao, Ligao, Sipicot, and Libmanan--which as a group seem to function as local service centers with from 31 to 54 functions. These centers perform a few area-wide functions and a larger number of local commercial, administrative, marketing and recreational functions than do the barangays. They tend, however, to be within the influence areas of the two Level I communities, and to serve more as complementary centers than as service areas for their own hinterlands. Most are clustered along the national highway or at a junction with the provincial roads.

A third level of about 43 settlements--about 3% of all communities in the Basin with about 10 percent of the population--act as small rural service centers, in which from 10 to 28 functions appear. Most of these functions, however, are highly localized and seem accessible only to people living in the immediate vicinity of the barrio or poblacion. These settlements have relatively small populations, averaging 4,000 and their economic significance seems to be limited to performing low-level residentiary functions.

The overwhelming majority of settlements--over 1300 or about 96% of the total--fall into a fourth category of residential, non-central places. These are villages of at most a few hundred families engaged in subsistence or near-subsistence agriculture, working as tenants on plantations or on small-family owned plots. The demographic surveys indicate that the majority of these barangays have populations of from about 400 to 1,000, generally too small to support any significant form of economic or service activity, even periodic

Table 4

FUNCTIONAL COMPLEXITY OF LEVELS OF SETTLEMENTS IN BICOL RIVER BASIN
1977

evel of Hierarchy	Functional Characteristics	Number of Settlements	Settlements	Range of Functions	Average Number of Functions	Percent of All Settlements	Percent of Basin Population	Average Population Size
I	Provincial Service Centers	2	Naga-Camaligan Legaspi-Daraga	60-61	60.5	0.14	10.6	89,892
II	Local Service Centers	11	Iriga, Tabaco, Goa, Tigaon, Pili, Nabua, Baao, Gulnobatan, Libmanan, Ligao	31-54	39.0	0.77	7.3	11,107
III	Rural Service Centers	43	37 Poblacions 6 Barangays	10-28	18.0	3.03	10.5	4,196
IV	Non-Central Places	1,363	2 Poblacions 1,361 Barangays	0- 9	2.0	96.06	71.6	922

Source: Staff Field Surveys, 1977.

markets, which are the most basic of agricultural exchange arrangements. All communities in this category have less than 9 functions; most contain only a few or none at all. The only functions consistently found in these barrios are ubiquitous local activities serving a neighborhood or cluster of houses: sari-sari stores and sometimes a chapel, elementary school, farmers association or civic organization. The implication is that most of the settlements have populations substantially smaller than necessary to support most functions found in the Basin and do not constitute viable economic entities. Their pattern of distribution, small size and weak linkages make them inadequate to serve basic human needs other than as a place to build a small hut or shelter. They provide none of the productive inputs needed to accelerate rural development. (See Figure 4).

It should be noted that Guttman scaling provided a functional profile of "built up areas" within the Basin with relatively little differentiation. There were few breaks in the scale scores. Level I and II settlements differ from each other only marginally. Comparison of scale scores with profiles of economic, social, physical, and demographic characteristics indicates that Naga and Legaspi are clearly the Basin's primary central places, but that Level II communities do not differ from each other significantly or from some Level III settlements. Some smaller Level III communities are indistinguishable, for all practical purposes, from many larger barrios in Level IV. Although there are sound methodological and technical criteria for dividing settlements into the four-level hierarchy on the basis of the socio-economic profiles, scalogram and Guttman scales, and while the division of the settlements into levels is extremely useful for analysis, planning and programming, in reality, there seems to be little functional specialization or division of labor among communities in the Bicol River Basin. This seems to reflect the predominance of its subsistence agricultural economy and low-levels of income.

Moreover, the analysis confirms national government studies that found that within the national spatial system of the Philippines even the largest central places of the Bicol are only "third level" settlements. An analysis of the Philippines settlement hierarchy recently undertaken by the Government designates Manila as the nation's primate city, which is at least 10 times the size of the only two other regional centers, Davao and Cebu. The Basin's cities of Naga and Legaspi fall within a third level of settlements performing

Figure 4

FUNCTIONAL CHARACTERISTICS OF LEVELS OF SETTLEMENTS IN THE BICOL RIVER BASIN

Function	Frequency of "Presence" of Function 1/			
	Provincial Service Centers	Local Service Centers	Rural Centers	Non-Central Places
Farmers Association	1	1	1	+
Agro-Processing Facility	1	1	1	+
Cottage Industry	1	1	1	+
Civic Organization	1	1	1	+
Sports Association	1	1	1	*
Paved Basketball Court	1	1	1	*
High School	1	1	1	*
Agricultural Extension Station	1	1	1	*
Rural Bank	1	1	1	*
Private Medical Clinic	1	1	1	*
Dept. of Local Govt. Office	1	1	1	*
Bureau of Plant Ind. Ext. Station	1	1	1	*
Bureau of Animal Ind. Ext. Station	1	1	1	*
Photo Studio	1	1	1	*
Piped Water Supply System	1	1	+	*
Construction Supply Store	1	1	+	*
Hardware Supply Store	1	1	+	*
Farm Supply & Agro-Chemical Store	1	1	+	*
Farm Equipment Repair Facility	1	1	+	*
Regular Public Market	1	1	+	*
Auto Repair Shop	1	1	+	*
Professional Organization	1	1	+	*
Playground with Equipment	1	1	+	*
Labor Unions	1	1	+	*
Credit Unions	1	1	+	*
Subdivision	1	1	+	-
Cockfighting Pit (regular)	1	1	*	*
Restaurant	1	1	*	*
Appliance Store	1	1	*	*
Drugstore	1	1	*	*
Funeral Parlor	1	1	*	*
Surveyor	1	1	*	*
Xerox Copying Service	1	1	*	*
Telecommunications Station	1	1	*	*
Private Hospital	1	1	*	*
Cinema with Daily Showings	1	1	*	*
Functional Power Plant	1	1	*	*
Train Station	1	1	*	-
Optometry/Optical Shop	1	+	*	*
Cooperative	1	+	*	*
Vocational School	1	+	*	*
Gymnasium/Auditorium	1	+	*	*
Banks and Financial Establishments	1	+	*	*
Bus Station with Repair Facility	1	+	*	*
Lodging Place	1	+	*	*
College	1	+	*	*
Cemetary (Memorial Park)	1	+	*	*
Shopping Center	1	+	-	-
Nursing School	1	+	-	-
Newspaper Publication	-	+	*	-
Cinema with less than Daily Showing				

PC (Constabulary) Station	1	*	*	*
Paluwagen (Welfare Society)	1	*	*	*
Operational Government Hospital	1	*	*	*
Port or Pier	1	*	*	*
Hotel	1	*	*	-
Security Agencies	1	*	*	-
Radio Station	1	*	*	-
Telephone Exchange	1	*	*	-
Fire Station with Truck	1	-	*	*
Night Club or Bar	1	-	*	*
Red Cross Office	1	*	-	-
Airport	1	*	-	-
Bowling Alley	1	-	-	-

Source: Staff Field Surveys, 1977.

1/ Frequency Symbols: 1= Frequently Present (50% or more settlements in Category)
+= Occasionally Present (25% to 49% of settlements)
*= Rarely Present (Less than 25% of settlements)
-= Not Present

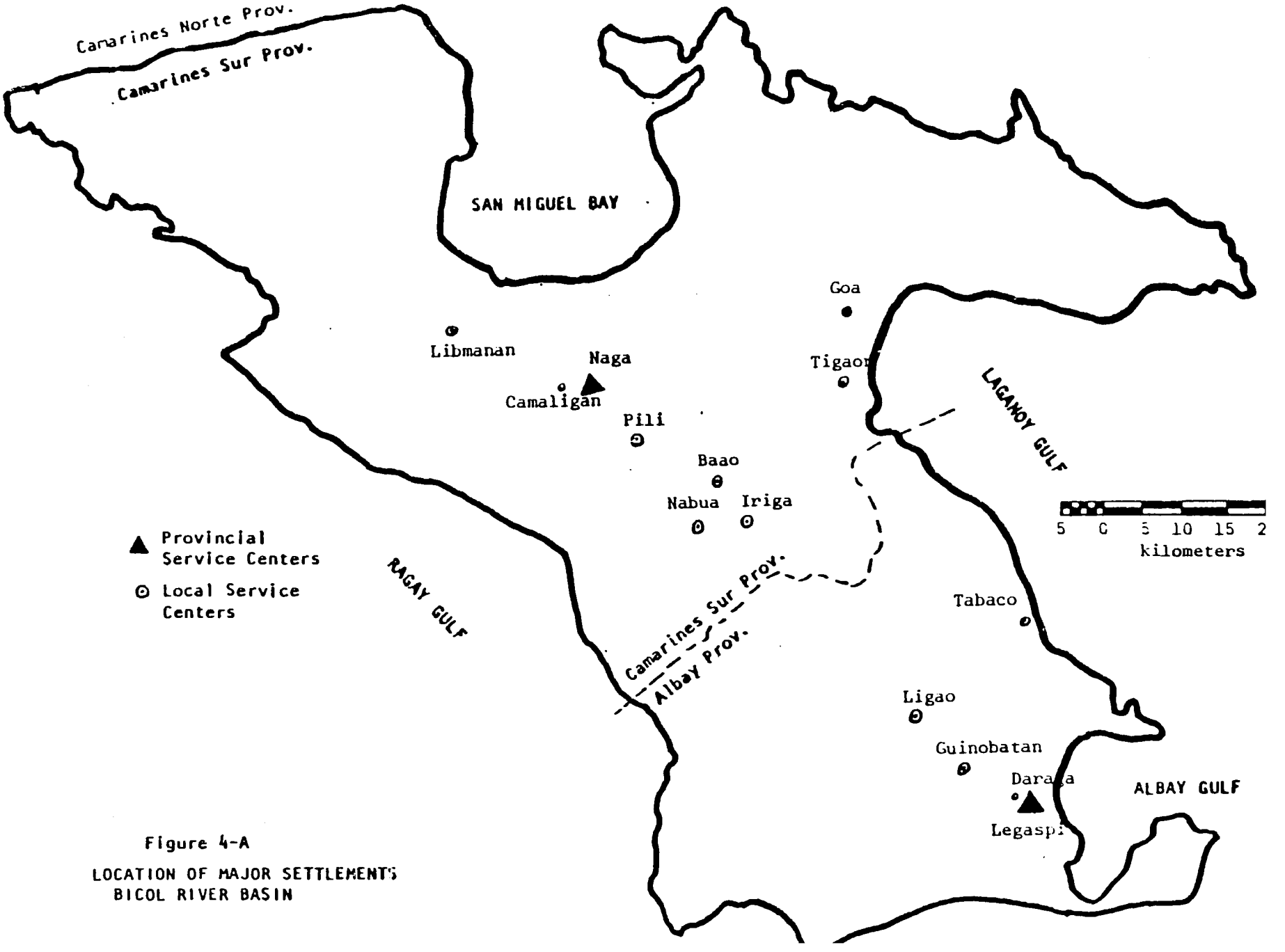


Figure 4-A

LOCATION OF MAJOR SETTLEMENTS
BICOL RIVER BASIN

subregional commercial and administrative functions. These two centers contain virtually no manufacturing activities, and except for limited agricultural exports and some cottage industries, provide little or no economic base for exchange with other centers outside of the Basin. They have limited absorptive capacity for migrants, offer limited nonagricultural employment opportunities and hold little current "growth pole" potential. Indeed, they are probably channels for population out-migration and for the outflow of resources from the Basin, rather than stimulators of area-wide development.

Linkages Among Settlements in the Bicol River Basin

The adverse effects on the rural poor of Bicol's highly skewed distribution of services and facilities are aggravated by extremely weak economic, physical, service and social linkages among settlements. Although some of the functions included in the scale could not be expected to be widely distributed--they are central functions requiring high population thresholds--most were basic commercial, administrative or service functions essential to meeting human needs and accelerating rural development. If they are not widely distributed in settlements throughout the Basin, then equity criteria would suggest that those living in rural areas should at least have easy access to places where they are located. But central places within Bicol are not easily accessible to most rural areas, and the urban and rural settlements are not strongly linked.

Transport studies, for instance, show that more than 70 percent of all roads in the Basin are of poor quality and need upgrading. Only the national highway cutting through the center of the Basin, and a few provincial roads, are of all-weather construction and passable during the rainy season. Farm-to-market roads are few and of poor construction. Many rural barrios can only be reached by small boat or on foot. The inadequacy of regular transport linkages is reflected in part by the use of non-motorized vehicles, animal-drawn wagons, use of illegal "skates" along the railroad tracks and small boats and barges and in part by the fact that the majority of trips taken within the Bicol River Basin are on foot. (See Table 5.) The railroad provides limited services to points outside the Basin and the major centers are linked to Manila by infrequent bus and air service.

Table 5

MODES OF TRAVEL, TRIPS TAKEN WITHIN BICOL RIVER BASIN

Mode	Frequency (in Percent) Albay Province	Camarines Sur Province
Walking	53.3	64.6
Jeepney	12.8	13.7
Trimobile	16.8	9.4
Bus	4.5	4.4
Mini-bus	4.0	3.1
Car	0.9	0.2
Truck	0.5	0.2
Two-wheeler	1.5	0.5
Train	0.1	0.8
Boat	1.0	1.6
Skates (Rail Hand-cars)	--	0.9
Animal Drawn Wagons	0.1	0.5
Others (Taxi)	0.2	--

Source: Bicol River Basin Development Program, Intermodal Transport Study, 1977.

Roads are used by 95 percent of the passengers taking trips within the Bicol River Basin and to transport 83 percent of agricultural commodities. But as physical linkages among communities, the roads provide rather poor service. Most of the rural population lives in settlements not easily accessible by road, and transport is difficult and expensive in most of the Basin. The costs of transporting commodities in interior rural areas is up to six times more than in areas connected by roads passable by motorized vehicles. Farmers from rural areas must often walk for hours to the nearest road and carry their produce on their backs or on slow-moving carabao or horses. Even after they reach a provincial road, the waiting times for a jeepney or bus are long and the costs so high that marginal profits are sometimes completely wiped out. Rural farmers must wait an average of 30 times longer for transportation at secondary roads than at places adjacent to the Manila South Road and in some more remote sections of the Basin they may wait as long as three or four hours

even along provincial roads. (See Tables 6 and 7).

Thus, most travel within the Basin is highly localized. The Intermodal Transport Study conducted by the BRBDP in 1977 found that because of the cost of transportation and difficulty of travelling, 85 percent of all trips taken within the Basin are among places within the same municipality and that 99 percent are within the same province. Relatively little travel--for shopping, work, trade, social interaction, or any other purpose--is intermunicipal and there is little interaction on a regular basis between the Basin's two provinces.

Physical infrastructure that might link communities, and that is necessary for higher level economic activities, is clearly inadequate. Electrical power is unreliable, with frequent brown-outs and black-outs, even in Naga and Legaspi. Telephone communications are sporadic, and most places within the Basin lack telephone exchanges.

Formal government linkages among levels are dominated by national ministries operating within the Basin, and formal structure is highly centralized. Most local officials are appointed by and responsible to national ministries. Municipal officials generally are not under the authority of the mayors, themselves holdover appointees under martial law, who have few resources to solve local problems. Most municipalities in the Basin are dependent on the national government for part of their revenues and most of their authority. Decisions are often made through highly personalized relationships.

Studies of government structure and services in Bicol indicate that services provided by all levels are highly localized. Health, education, and other public institutions generally extend services only to populations living in the immediate vicinity of their situs or to the few who can afford to travel from rural barangays to obtain them in the larger cities. Even the post-secondary schools in the larger centers primarily only serve the local area. Health, education and agricultural extension services are far below standards set by national ministries. Case studies undertaken by the University of the Philippines College of Public Administration indicate that location decisions for public facilities and services are highly political in nature, generally without regard for areawide or spatial implications and often get bogged down in lengthy political conflicts.

Table 6

POPULATION AND SETTLEMENTS ACCESSIBLE BY MEANS OF TRANSPORTATION, BICOL RIVER BASIN, 1976

Means of Transportation	Camarines Sur Province		Albay Province		Bicol River Basin	
	Population	Settlements	Population	Settlements	Population	Settlements
	(Percent)		(Percent)		(Percent)	
All-Weather Concrete Highway (Manila South Road)	9	4	9	3	9	4
Asphalt Roads	4	2	13	6	7	4
Gravel and Earth Roads	35	39	46	48	40	42
Footpaths	42	41	30	39	37	41
Waterways	7	11	--	--	4	7
Railway	3	2	2	3	3	2

Source: Staff Surveys, Bicol Transportation Study (1976), Department of Public Highways, Camarines Sur and Albay Provinces.

Table 7

AVERAGE COSTS OF TRANSPORTING AGRICULTURAL COMMODITIES FROM INTERIOR AND ROADSIDE AREAS, CAMARINES SUR AND ALBAY PROVINCES, 1975

Commodity	Costs of Transportation (Pesos per ton/kilometer)			
	Camarines Sur Province		Albay Province	
	Interior	Roadside	Interior	Roadside
Rice	18.30	3.99	21.46	2.78
Copra	17.55	4.04	18.81	2.85
Corn	21.93	3.33	25.79	2.49
Abaca	23.60	6.79	14.58	3.17
Fruits & Vegetables	21.76	5.51	37.80	3.30
Average--All Goods	20.63	4.73	23.68	2.92

Source: BRBDP Transport Study (1976).

Because settlements are weakly linked and the interdependencies are not clearly visible, each local jurisdiction pursues its own interests in making investment and location decisions, without considering larger regional development issues.

To the extent that the integration of settlements within a region occurs through social interaction among residents--through kinship ties, visiting among kin and friends, intervillage marriages, and for recreation and ritual--social linkages reflect the degree to which people perceive of a region as a coherent and unified unit of society. Surveys of selected social interaction indicators show relatively little social linkage among settlements within various sub-areas of the Bicol River Basin. A sample survey of marriage records showed that an average of less than 19 percent of all spouses were chosen from outside the same municipality during a three year period during the mid-1970s. Over 80 percent of all men and women in Bicol, during that period, tended to choose spouses from within their own municipality, and in most cases, from within the same or a neighboring barangay. Since social interaction patterns in the Philippines are shaped strongly by family visiting, marriages among people from different towns and municipalities would be expected to increase social interaction among those places. But the intermodal transport studies confirm the indications of marriage pattern studies, that relatively few intermunicipal trips are for social purposes.

Finally, market linkages, which should form a major network of commercial interaction within predominantly rural areas, are also weak in Bicol. The greatest amount of market interaction occurs through the central markets located in Naga and Legaspi cities. A significant portion of the Basin's population lives in settlements too small to support even a periodic market, which adversely affects their ability to sell agricultural surpluses, raise their income levels, obtain household goods or to buy inputs needed to increase agricultural production.

Analysis of commodity flows and market functions of six of the largest centers within the Basin and six of the prominent periodic markets indicate that:

1. Markets within the Bicol River Basin are primarily local exchange centers. Nearly all commodities traded within the markets surveyed are obtained from and sold to people who live within the municipality. Except for manufactured consumer goods, which are

imported from Manila for resale through the Naga and Legaspi markets, even the two largest market centers primarily only serve their immediately surrounding territory. Although the Legaspi-Daraga market serves some residents of nearby Sorsogon Province, little trade takes place on a regular basis between Naga and Legaspi or between their markets and those in other provinces.

2. Market centers have a limited "reach" or service area and are not well integrated into a network of exchange and trade. The survey further indicated that a "nested" hierarchy or articulated network of markets, characteristic of more economically developed regions, does not exist in Bicol. Naga and Legaspi do serve as the primary centers for a set of smaller markets for some commodities, but Naga trades with only about three-fourths of the municipalities within its own province and with only 17 towns in Albay Province. Approximately the same percentage of municipalities in Albay trade with the Legaspi-Daraga market, but fewer places are connected from Camarines Sur Province. Smaller regular markets within Bicol obtain and sell nearly all of their goods within a 10 kilometer radius.

3. Markets within Bicol are primarily undifferentiated agricultural exchange points. The substantial majority of goods traded in Bicol markets consist of six agricultural commodities, including rice and palay, coconut and copra, fresh and dried fish, poultry and livestock. Only Iriga trades in more manufactured than agricultural goods. There is virtually no specialization among smaller markets, although a greater variety and volume of imported (from Manila) consumer products can be found in Naga, Legaspi and Iriga than in any other markets in the Basin.

4. Bicol River Basin markets have insignificant external trade linkages. Although all processed and manufactured goods are imported from Manila or a few other external cities, even the major market centers in Bicol trade primarily only with other internal markets. Naga, Legaspi, Iriga and Tabaco export a small amount of agricultural commodities such as copra and abaca and some local handicrafts, but more than 80 percent of all transactions are local.

5. Periodic markets are generally isolated, highly localized and virtually unintegrated collection and exchange points. Most of the periodic markets in the Basin are located in poorly accessible rural barangays and nearly all are more than 10 kilometers from the

CHARACTERISTICS OF SELECTED PERIODIC MARKETS, BICOL RIVER BASIN, 1977

	Market					
	Payatan	Pili	Paulba	Sinungtan	San Gabriel	San Ramon
Location	Along provincial road; midway between Goa and Tinambac	On southern coast of mainland Bacacay	Along third class provincial road; adjacent to church	Along municipal road within barangay of Sinungtan	Opposite chapel adjacent to Manila South Road	Outlying mountain barrio northeast of Iriga City
Physical Size	One half hectare; 60 temporary stalls	1500 sq. meters, 11 roofless, 6 covered stalls	One hectare; 8 bamboo tables	About 1400 sq. meter building, partly open.	One-half hectare, semi-permanent structure	One-half hectare, 30 permanent stalls
Number of Sellers	66	10 itinerant peddlers and some Islander farmers	107	Variable	77	Variable
Average Number of Customers	About 900 on market days	About 1800	About 1800	--	--	About 1500
Market Days	Monday	Saturday	Wednesday, Sunday	Sunday	Friday	Wednesday, Sunday
Population of Barangay	901	1,072	1,688	1,515	1,481	1,764
Distance to Next Nearest Market Center	12 kilometers	15 kilometers	15 kilometers	14 kilometers	13 kilometers	4 kilometers
Reason for Establishment	Cockfighting Pit in Barangay	Presence of Port	Cockfighting Pit in Barangay	Cockfighting Pit in Barangay	Cockfighting Pit in Barangay	Central location of Barangay
Service Area	Average radius o 6 kms.; up to 16 kms; 18 Barangays in 3 towns of Goa, Calabanga, Tinambac	Average radius of 6 kms.; up to 15 kms.; 14 Island barangays, 5 mainland	Average radius of 5 kms; 21 barangays of Ligao and 8 of Oas	Average radius of 4 kms.; up to 17 kms; 10 barangays and 9 sitio	Average radius of 5 kms.; up to 13 kms; 9 towns in Camarines Sur, 2 towns in Albay	Average radius of 3.5 kms.; 9 barangays in Iriga; 5 in Ocampo; 4 in Buhi

	Payatan	Pili	Paulba	Sinungtan	San Gabriel	San Rason
Commodities Traded (in order of importance)	Rice, sugar, fish, groceries, root-crops, fruits, vegetables, coconut, livestock, personal wear, school supplies	Rice, groceries, fish, baked goods, vegetables, personal wear, copra, mats, abaca, chickens, firewood, rough lumber, bamboo, anahaw leaves	Rice, groceries, clothing, fish, copra, vegetables, ipil-ipil, palay, corn, handicrafts, chickens, firewood, anahaw leaves	Copra, hogs, abaca, carabao, handicraft, firewood, anahaw leaves	Rootcrops, dried fish, groceries, fruits, vegetables, copra, coconuts, rice, personal wear, sugarcane products, bread	Rootcrops, vegetable, fruits, coconuts, rice, onions, garlic, eggs, processed fish products
Flow of Commodities	Inward: rice, sugar, fish, groceries, personal wear, school supplies Outward: rootcrops, fruits, vegetables, coconuts, livestock	Inward: rice, groceries, household items, school supplies, personal wear Outward: rice, corn, vegetables, sugarcane, livestock	Inward: rice, groceries, clothing, dried and fresh fish, corn Outward: abaca, citrus, handicraft, ipil-ipil	Inward: rice, groceries, household items, abaca, cattle, carabao Outward: copra, hogs	Inward: sugar cane products, personal wear, groceries Outward: root-crops, coconut, vegetables	Inward: rootcrops, freshwater fish, fresh sea fish, processed products Outward: rootcrops, vegetables, fruits, coconuts, eggs
Accessibility	90 percent walk, 10 percent rice bus or trucks	Walking, passenger jeeps, bus and tricycles	92 percent walk, or use animal drawn sleds, 8 percent with motorized vehicles	87 percent walk 13 percent passenger jeepney or minibus	Walking, jeeps, minibus	Walking, jeepneys, minibuses

Source: Staff Field Surveys, 1977.

next largest town. Of the six periodic markets surveyed in detail, most were established in association with a regular social activity in the barangay. Thus they are sited either near a church or a cockfighting pit and meet once or twice a week. All have a small number of stalls (average 30) and trade primarily in fruits, vegetables, poultry, rice, clothing and small household items. These markets obtain and sell their goods from people living within or near the barangay, usually 6 to 10 kilometers, although in remote areas people may come from as far as 25 to 35 kilometers. For most rural people in peripheral municipalities, the periodic market is the only organized outlet for trade to which they have access. The periodic markets are generally not linked to other markets in the Basin, except by some middlemen who bring manufactured goods from the cities on occasion to exchange for scarce local agricultural commodities. Farmers living outside of the market barrio must often start out on foot the night before, transact their business early in the morning and return home before the heat of the day makes travel difficult.

Policy and Program Recommendations

The findings of the spatial analysis led to a number of important policy and program recommendations:

1. BRBDP plans based on the assumption that the Basin is a cohesive subregional economy should be thoroughly re-examined and fundamental changes should be made in planning strategy. The analyses provide virtually no basis for concluding that the Basin is a cohesive economic system. At least five subarea economies operate independently of each other. The Naga-Camaligan-Pili centers and their immediate surrounding rural areas, the Legaspi-Daraga centers and their surrounding hinterlands and the cluster of communities close to the city of Iriga form three urban-centered economic subsystems. Smaller, primarily subsistence agricultural, trade areas are scattered in rural municipalities of the Basin, operating at relatively low levels and in virtual isolation. They are centered on small regular markets or larger periodic markets. Finally, relatively isolated rural areas with subsistence agriculture and fishing economies and with access only to small periodic markets, are found in coastal and remote areas of the Basin. There is little interaction or linkage among these sub-economies, and indeed, very little regular exchange, travel, social interaction

or commercial intercourse between the Basin's two constituent provinces. The socio-economic and linkage analyses of the Urban Functions in Rural Development study provide the basis for re-examining the assumptions and strategies of BRBDP plans for dealing effectively with problems raised by the current pattern of spatial and economic development.

2. The BRBDP's "Integrated Area Development" boundaries, which were drawn on the basis of water-resource and physical-homogeneity criteria, need fundamental re-evaluation in terms of their relevance for economic and spatial development. The IAD boundaries take almost no cognizance of economic and spatial subsystems in the Basin, and in fact, divide what seem to be economically related clusters of communities. For example, six IADs--Sipocot-Del Gallego, Libmanan-Cabusao, Naga-Calabanga, Baliwag-San Vincente, Pili-Bula and the Rinconada IADs--cut across the spatial and economic subsystem centered at Naga. Two other IADs divide the Legaspi subsystem. Some IAD boundaries --such as Partido and Caramoan--encompass only rural areas, make no attempt to include existing or incipient urban centers and offer no strategy for integrating these rural areas with urban centers. Little attention has been given to the question of how IAD development will integrate rural production areas with urban-centered marketing towns, or how IAD planning will promote market center growth, spatial specialization and division-of-labor, or exchange among settlement clusters within the Basin. The settlement system analysis, the analytical maps and linkage studies in the Urban Functions plan provide the basis for evaluating and redrawing IAD or other sub-Basin planning unit boundaries.

3. The BRBDP and other national ministries operating in the Basin should give immediate attention to providing increased transportation access to a larger number of rural municipalities. Currently, transportation linkages among settlements and between urbanized centers where major markets are located, and rural agricultural areas, are extremely weak. It is inconceivable that BRBDP will be able to attain its goals of increased agricultural production, economic diversification and more equitable distribution of services and facilities without first extending transportation access. A network of all-weather and farm-to-market roads is an essential precondition for extending services to rural people, locating agro-processing facilities in rural areas and providing access to the services, facilities and productive activities now located in the

cities and poblacions. It is unlikely that an integrated road system or that a rural industrial base will develop without physical access among settlements within the Basin and linkages with other regions, especially Metropolitan Manila. The transportation linkage analysis and maps, and the functional complexity studies of settlements in the Urban Functions report offer essential information for evaluating the proposed rural road investment package and for establishing more detailed locational criteria for specific road segments.

4. The paucity of markets and market towns within the Basin requires the immediate attention of BRBDP planners. Future investments in services, facilities and infrastructure must be located strategically in existing or incipient rural service centers to stimulate the growth of markets. Without a well-dispersed, integrated and easily accessible network of market centers in rural areas it is unlikely that farmers will increase production to the levels projected by the BRBDP. Extensive studies of agriculture in the Philippines and elsewhere indicate that farmers will not increase output unless they can easily market their goods and receive a fair price, both of which are extremely difficult for the rural poor in Bicol without access to regular markets. The current costs of transporting agricultural goods, because of the paucity of markets in rural areas and the lack of access to transportation in Bicol, wipes out marginal profits for many rural people. The BRBDP has, to this point, concentrated on planning for the provision of agricultural inputs to stimulate production, but has given little attention to the marketing and distribution of outputs. Creation of a hierarchy of market towns and market centers throughout the Basin cannot await spontaneous development; incentives, preconditions and assistance must be provided through investment, location and development decisions. The Urban Functions study pinpoints the location of existing or incipient market centers and the analysis, supplemented by more intensive marketing studies, can be used in planning for the location of investments that will stimulate market center growth.

5. Finally, the Urban Functions study provides a profile of settlements and of the distribution of functions that can be used in developing more detailed locational criteria for particular types of functions, for generating allocation standards for services, facilities and infrastructure investment, and for establishing specific location criteria that will increase

the access of the rural poor to town-based services and facilities, articulate the spatial system and stimulate the growth of various settlements in the Basin to a size capable of supporting productive activities. The BRBDP should consider developing "Minimum Packages" of services, facilities and infrastructure needed to promote functional specialization in settlements of various sizes, to meet basic needs in existing settlements, and to integrate communities into a more cohesive economic and spatial system. The Urban Functions study found three types of settlements needed in the Basin (see Figure 6):

a. Rural Service Centers which would contain services and facilities to assemble agricultural commodities for marketing, provide local periodic marketing functions, extend transport access to market towns and larger urbanized centers, accommodate small-scale agro-processing and handicrafts, distribute credit, market information and other technical inputs, facilitate savings mobilization, and provide basic health, recreation, education and administrative services;

b. Market Towns and Centers, which would provide an area-wide exchange point for trade in agricultural commodities, processed goods, household and common consumer products, and farm inputs; offer access to an all-weather road network; serve as a node of transportation and distribution linked to regional centers within the Basin; provide the preconditions and infrastructure to stimulate agro-processing plants and small-scale bulk commodity handling facilities; make available a variety of rural financial and credit services; meet rural energy and utility needs; provide higher-level administrative services that cannot be found in rural service centers; and offer vocational and secondary education, health and child care services, and rural commercial services; and

c. Regional Centers, which would be physically linked to each other and to urban centers outside the Basin by frequent and reliable transportation and all-weather roads, offer diversified commercial, financial, professional and administrative services, accommodate

Figure 6

SERVICES, FACILITIES AND INFRASTRUCTURE PROPOSED FOR EACH SETTLEMENT LEVEL
BICOL RIVER BASIN

General Functions	Rural Service Centers	Market Towns and Centers	Regional Urban Centers
Transport and Communications	-Surfaced, All-Weather Roads -Farm Access Roads -Bus Stop -Regular Bus or Jeepney Service to Rural Collection Points -Gas Station -Telegraph Service -Postal Service	-Asphalted, All-Weather Roads -Bus Terminal -Trucking or Bulk-Distributing Services -Regular Bus or Jeepney Service to Rural Service and Regional Urban Centers -Gas and Service Station -Auto Spare Parts Retail Store -Telegraph-Radiogram Service -Telephone Station -Postal Services	-Concrete Highway to Major Urban Centers -Bus Terminal with Major Repair Facilities -Auto & Machine Repair Shops -Vehicle and Machine Spare Part Shops -Regional and Interregional Trucking and Bus Services -Gas and Service Stations -Railroad, Port and Air Terminals -Telegraph, Telegram, Telex Services and Facilities -Telephone Exchanges linked to Major Urban Centers and Market Towns -Postal Distribution Centers
Marketing, Trade and Shopping	-Periodic Market Facilities -Farm Implements and Agricultural Supply Shop -Marketing Cooperative Outlet -Storage Facilities -General Store or Sari-Sari Stores -Milling Facilities	-Daily Market Facilities -Retail Outlets for Farm Supplies -Wholesale Outlets for Farm Implements -Cold Storage and Warehouse Facilities -Grocery Shops -Household Goods Retail Shops -Grading and Bulk Assembly Facilities	-Diversified Daily Market -Distribution Outlets and Sales Offices for Farm Machines -Farm Supply Wholesalers -Cold Storage and Warehousing -Agricultural Commodity Brokers and Distributers Outlets -Diversfied Commercial Retail and Wholesale Establishments -Retail Outlets for Consumer Goods, Household Goods -Consumer Specialty Shops
Industrial and Manufacturing	-Cottage Industry -Small Scale Craft Shops -Small Machine Repair Shops and Metal Shops	-Bulk Commodity Processing Facilities -Agricultural Processing Plants -Small Scale Consumer Goods Manufacturing Facilities -Small Machine, Implement and Metal Shops	-Agro-Industry and Agribusiness Facilities -Commodity Processing and Packaging -Rural Goods Production and Distribution Facilities -Small Tool and Implement Production Facilities

Finance	-Rural Bank -Credit Cooperative	-Commercial and Savings Bank Facilities -Rural Bank with Nonagricultural Loan Programs -Credit Cooperatives -Moneylenders and Pawnshops	-Development and Commercial Bank Branch -Savings and Loan Associations -Insurance and Financial Establishments -Urban and Rural Credit Coops -Brokerage Firms -Chambers of Commerce -Small Industry and Business Incentive Programs
Public Utilities	-Piped Water Supply Point -Small Water Filtration Facilities -Residential Electricity	-Electrical Energy Station -Residential Piped Water Supply -Residential and Commercial Area Drainage Systems	-Electric Supply Grid -Piped Water System -Sewerage and Drainage System -Waste Disposal System
Administration	-Municipal Service Office -Barangay Government Office -Police or PC Sub-station -Municipal Court Branch -Agricultural Extension Station	-Municipal or Barangay Govt. Office -IAD Team Headquarters Office -Police or PC Station -District Offices of Agricultural Extension -Judicial Facilities -National Ministry Program District Offices	-Provincial Government Offices -Municipal Hall and Administrative Offices -Regional Planning and Development Agency Offices -Municipal and Provincial Court -Branch Offices of National Ministries -Regional Office Headquarters
Recreation and Social	-Paved Basketball Court -Multi-purpose Community Center	-Paved Basketball Court -Small Gymnasium/Auditorium -Restaurants and Coffee Shops -Cinema -Playground with Facilities	-Paved Basketball Courts -Parks and Plazas -Cinema with Daily Run -Hotel with Nightclubs -Restaurants -Gymnasium/Auditorium -Multipurpose Community Center -Diversified Social Activities
Education	-Primary Schools -Vocational Education Facilities	-Primary Schools -High Schools -Vocational Schools -Extension and Home Economics Classes -Agricultural Demonstration Facilities	-Primary and Secondary Schools -Small Colleges and Technical Schools -Specialized Vocational Training Programs -Regional Agricultural Research Station
Health	-Dispensary-Clinic -Maternal/Child Care Service	-Multi-Purpose Clinic -Area Health Office -Physicians, Dentists -Drugstores	-General Hospital -Public Health Offices -Physicians, Dentists, Surgeons -Retail Pharmaceutical Outlets

regional offices of national government ministries and branch offices of provincial government agencies; provide facilities for large-scale and diversified markets, function as a communications node for a broad rural hinterland, provide sites for agri-business and large-scale agricultural processing, offer incentives for a variety of small-scale consumer goods industries, tool-making and repair workshops, machine-shops and light durable goods industries; offer higher educational opportunities and more specialized vocational training, and provide diversified and multi-purpose hospitals and health clinics.

Minimum packages of investments can be developed through careful analysis of Urban Functions study findings, supplementary micro-spatial studies and special surveys of agribusiness and agroindustry potential. The Urban Functions study, expanded and updated, can also provide the basis for identifying and designating existing or incipient settlements for the types of functional specializations outlined above. Follow-up studies can augment the Urban Functions Project findings in developing locational criteria for investment in specific services and facilities.

EVALUATION OF METHODOLOGIES AND ORGANIZATION

Three aspects of the project require more careful review and evaluation in order to determine the applicability of procedures and methodology in future integrated spatial analysis projects and the replicability of the Bicol project in other countries. These include the project organization, the conceptual framework and principles for selecting methodologies, and the analytical methods and techniques tested in the Bicol project.

Project Organization

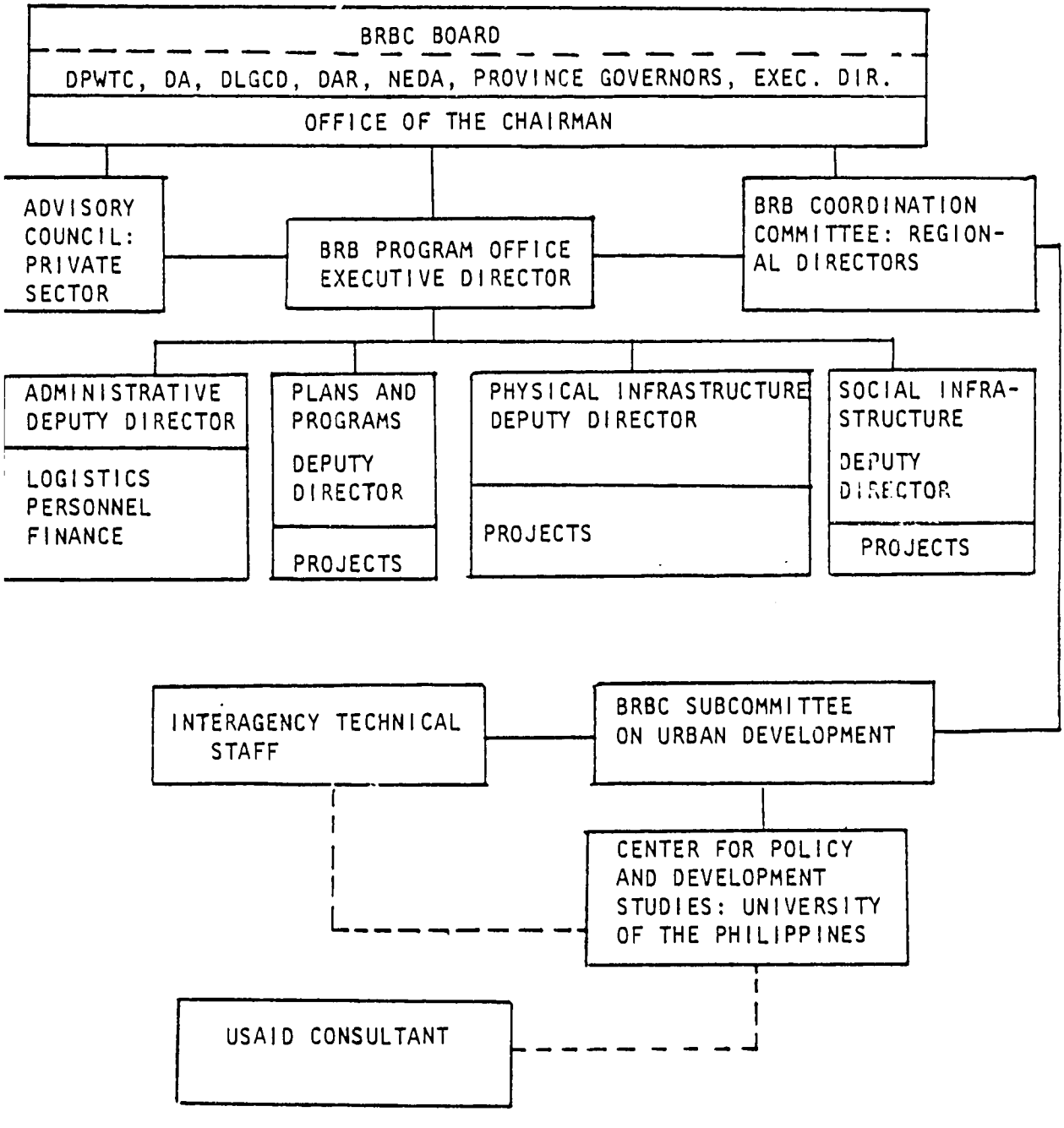
The project was organized in such a way as to achieve three major objectives: (1) to obtain a core staff of professionals with training in spatial analysis and planning to design and conduct the study efficiently and effectively; (2) to elicit widespread participation by Bicol planners, technical personnel and governmental leaders; and (3) to assure that the planning processes and procedures would become a part of the continuing planning and programming activities of the Bicol River Basin Development Program.

The BRBDP contracted with the Center for Policy and Development Studies (CPDS) and the University of the Philippines--Los Banos (UPLB), to organize, design and conduct the project. The CPDS assembled a professional staff of planners and social scientists to carry out research and plan preparation, and a group of University of the Philippines professors to act as local consultants. The consultants were to (1) assist the project staff in formulating concepts and approaches to research; (2) identify special studies, data or analyses needed to implement the project effectively; (3) advise the staff on literature and studies relevant to the project; and (4) review all reports and draft plans and make recommendations for changes and improvements. In the initial phases of the project, CPDS maintained a field office in Bicol and when data collection was completed, moved the staff to Los Banos and Manila.

In addition, two advisory committees were established within the Bicol River Basin. First, the Sub-committee on Urban Development of the Bicol River Basin Coordinating Committee was established as a steering committee for the project. Chaired by the regional director of the

Figure 7

ORGANIZATIONAL STRUCTURE OF THE BICOL RIVER BASIN DEVELOPMENT PROGRAM AND THE URBAN FUNCTIONS IN RURAL DEVELOPMENT PROJECT



Department of Local Government and Community Development (DLGCD), it was to meet monthly to review progress and react to findings. Since the members of this committee represented the major "users" of the spatial analysis, their inputs were seen as crucial to making the study relevant and useful. Members of this committee included representatives of the National Economic and Development Authority (NEDA) Region V staff, and the departments of Public Highways, Public Health, Education, and Social Services, the two Provincial Governors and the Mayors of Naga, Iriga and Legaspi. A second committee, the Interagency Technical Staff (IATS) would involve, at the working level, representatives from each of the major government agencies and governmental units in the Basin as well as technical staff members and planners of the BRBDP. The purpose of this committee was to supplement the project staff with technical personnel from agencies that make major locational and spatial decisions, to involve them in the analysis, and to train them in methods and techniques of spatial planning. IATS members were seen as the core of trained manpower that would remain in the Basin after the project was completed, and who would institutionalize the planning process in their agencies.

A U.S. consultant, under contract to USAID's Office of Urban Development in Washington, performed the following tasks:

1. Provided assistance to the project staff in the development of a detailed conceptual framework and plan of implementation for the project;

2. Provided general technical assistance on project implementation and spatial analysis as requested by the project staff and as in the consultant's judgment was necessary for the successful completion of the project;

3. Monitored the progress and technical development of the project for USAID, focusing on technical progress, timing, management, and identification of implementation bottlenecks, and provided assistance in overcoming problems;

4. Provided a basic conceptual orientation and assistance with training on spatial and linkage analysis methodologies, and participated in planning for analysis and final report preparation;

5. Assisted with the recruitment and orientation of technical experts and consultants needed to carry out the project;

6. Visited the project in the Philippines quarterly to perform monitoring and evaluation functions and technical assistance activities requested by the project staff; and

7. Reviewed and evaluated the overall project and the final plan.

Although the organizational structure proved to be adequate for implementing and completing the project, a number of administrative and organizational problems arose that should be considered in the design of future pilot projects. Among the factors to be taken into consideration are the following:

1. Subcontracting the project to an organization outside of the BRBDP removed activities from its direct supervision and concern. Since the BRBDP was expected to institutionalize the procedures and processes tested in the project, it should have been more directly and continuously involved in carrying out the spatial analysis and formulating the final report. Although BRBDP staff members were regularly briefed and participated in training and workshop sessions, the project was more closely identified with CPDS than with BRBDP and the institutional linkages were not always strong. The capability of CPDS rather than of BRBDP to do spatial analysis was strengthened by the project, and unless a "transfer" process is established, the project will have less effect within BRBDP than anticipated.

2. The Urban Development Subcommittee and the IATS were an effective means of informing technical personnel and local political leaders about the purposes and intent of the project in the early stages, and provided a valuable channel for obtaining support and information. The committees were less successful, however, as participation or review mechanisms. The Urban Development Subcommittee, in reality, did not function as a steering committee or as a channel for obtaining reviews or reactions to the project's output, and the IATS never operated as a body. Some members were involved in the project on an individual basis and most attended the training workshops, but the expectation that these committees could be used to supplement the project staff, provide coordination and elicit active participation was probably unrealistic given the

limited number of people involved, the continuing pressures of activities within their own agencies and the fact that the staff was removed from Bicol during later stages of the project.

3. A set of strong bureaucratic constraints within the contractor's organization--CPDS--sometimes made implementation of the project more difficult than necessary:

a. Somewhat outdated and highly rigid budgeting and procurement procedures within the University of the Philippines--Los Banos system sometimes resulted in long delays in drawing-down funds from the government, in paying employees and in procuring needed equipment and supplies. Restrictions on salary levels, sub-contracting and procurement of specialized skills often inhibited proper staffing and created serious morale problems.

b. Placing a large number of local consultants on retainer for the duration of the project, in retrospect, was both ineffective and uneconomical. Consultant participation except for a few individuals, was sporadic. Consultant services should have been contracted on a task-performance basis at strategic times during the project.

c. The inability of CPDS to obtain the services of key staff members on a full-time basis seriously inhibited progress and delayed completion. The overwhelming burden of work throughout the project fell on a few core staff members who often had inadequate support.

d. The difficulty of reorganizing the staff for different types of work as the project progressed also caused serious problems. In many cases personnel who were hired to perform routine data collection, compilation and analysis tasks, needed only in the first phase of the project, could not be replaced by people with different types of skills who were needed in the second and third phases.

e. CPDS's difficulty in supervising subcontractors resulted in serious delays in completing some aspects of the project and the failure to complete some special studies considered important for the final report

Although the organizational arrangements designed at the beginning of the project were reasonable and worked

effectively, the difficulty of reorganizing or of exercising sufficient managerial flexibility as the nature of work changed, created delays and overburdened a few key staff members.

Conceptual Framework and Principles for Selection of Methodologies

The project was organized and decisions were made concerning selection of methodologies on the basis of specific principles related to the need for spatial analysis techniques that could be used effectively by planners and decision-makers in rural areas, to the conditions in rural areas where the project was likely to be replicated, and to the opportunities and constraints found in the Bicol River Basin. Some of the principles were inherent in the project and were designed into organization and procedures at the outset, while others emerged during implementation. Among the operating principles used in the project were the following:

1. Creation of an on-going planning process as well as production of a spatial development plan. The objective of the project, as noted in the Project Agreement between the Government of the Philippines and the U.S. Agency for International Development, was twofold: first, "to develop a planning process--potentially valid for application elsewhere in the Philippines and in other countries" and second, to develop "a plan for strengthening the contributions of urban centers to rural development in the Bicol." The outputs of the project were to be both a spatial analysis and plan for development of the Basin as well as a process that could be institutionalized within the Bicol River Basin Development Program, allowing the BRBDP to update and revise the plan on a continuing basis. Although the project staff made extensive efforts to fulfill both objectives--primarily through eliciting the participation of technical personnel, BRBDP planners and GOP consultants in the project's operations, and through a number of training and workshop sessions--staff time and attention inevitably focused on analysis and plan preparation, often subordinating institutionalization functions. The workshops held quarterly in the Bicol proved to be an effective way of keeping a core group of technical personnel and political leaders informed of activities during the first months of the project, but participation fell off as the project proceeded. The pressures of time and the conflicting commitments

of political leaders made their attendance sporadic. Once staff activities were moved from Bicol to the University of the Philippines at Los Banos, it became more difficult to provide information and elicit participation. Moreover, as time pressures began to build on the staff to complete stages of the project and components of the analysis, more expedient and less participatory procedures were adopted. The linkages between the project staff and BRBDP planners were often tenuous during the operation of the project, and continuing interaction became difficult during later stages when the staff moved from Bicol to Manila and Los Banos.

2. Design of the spatial analysis and development plan to be policy-oriented and adjunctive in nature. The plan or spatial analysis would be oriented to the decision-making requirements of the Bicol River Basin Development Program, regional offices of national government agencies, and provincial and local governments that would be making investment and location decisions in the Basin over the next ten years. As the regional director of the Department of Local Government and Community Development expressed it during an early organizational workshop, the output of the Urban Functions in Rural Development project should be input for the planning efforts of other organizations. The plan would not be a comprehensive regional development scheme per se, since NEDA, the major cities, and the BRBDP already had comprehensive development plans. Instead, the Urban Functions report would provide a spatial dimension useful for making locational decisions and for revising comprehensive development plans. The data and analysis would supplement technical criteria used by various organizations in making investment decisions.

3. Use of applied research methods and analytical techniques easily performed by rural planners and easily understood by policy makers. The analytical techniques used in the project would have to be appropriate to the needs for applied policy analysis and to the planning capacities found in rural areas. Policy plans, to be useful, must be done quickly and be timely; policy oriented studies cannot usually depend on time-consuming data collection and highly-sophisticated techniques. Moreover, the analytical techniques should not themselves impose complicated, costly and time-consuming requirements on users. They should be relatively easy to apply and not require sophisticated equipment or high levels of technical skill and training, which are not usually

found in rural areas. If the methods are to be institutionalized in local planning processes they must be of a type that can be applied manually or with such simple equipment as desk calculators. If they are to be applied by planners and administrators with limited technical training in spatial analysis, they should involve relatively simple and easily learned operations.

Moreover, the methods and techniques should be understandable to the rural policy-makers who will use the analysis, and even more importantly, the results of the analysis must be clear to decision-makers who will have limited exposure to or interest in spatial analysis methodology and who may be alienated by difficult or complex analytical methods. The primary audience for the analysis will, in most cases, be people with limited time for or interest in the methodological implications of the study. The methodology, therefore, would consist primarily of descriptive statistical techniques, analytical maps, scales and comparative charts.

Although most participants in the project eventually accepted the general principle, strong tendencies to deviate from it were apparent in the early stages of the project. Some of the staff members--most of whom had masters degrees--the University of the Philippines professors who acted as consultants, and some of the BRBDP planners, often showed more interest in relatively sophisticated methodology and often viewed the project as scholarly research rather than as an exercise in applied policy analysis. Staff members worried that the results derived from more simplified descriptive techniques would not carry the "authority" of thcse generated by sophisticated statistical methods and computer analysis. However, as the project progressed, and the limitations of available data, the requirements of collecting additional information to fit complex analytical methodologies, the difficulties encountered in explaining more sophisticated methodologies to political leaders and technical personnel in government agencies, and the constraints on operationalizing computer-based techniques became more apparent, the principle was accepted more readily. Some attempts at computer analysis failed because of the lack of adequately trained manpower, and others--especially the Guttman scales--could not be run because of limited computer capacity. Ultimately, the project came to adapt descriptive, graphic and manually calculated techniques that seem to have been accepted by all participants.

4. <u>Use of as much existing data as possible; limit</u>

new data collection to areas where significant "information gaps" appear. Because a number of studies had been previously conducted in the Bicol and because the Philippines had extensive census and statistical materials, the planning and analysis methodologies were tailored as much as possible to using existing data, turning to methods requiring additional data collection sparingly and only when crucial information gaps were identified. Limitations of time and money made large-scale data collection and extensive original research impossible. The Urban Functions study would draw as heavily as possible on census materials, the Social Science Research Unit (SSRU)'s previous studies of the Basin and the specialized technical studies performed by and for the BRBDP.

Although the Bicol River Basin was relatively "data rich" for a rural depressed region, it soon became obvious that much of the available data was not collected or reported in forms appropriate for spatial analysis. Among the weaknesses of the existing data base were:

1. Nearly all socio-economic data were reported at either the province or municipal level and could not be disaggregated to the barangay.

2. It was often difficult or impossible to make meaningful distinctions between poblacions and rural barangays with socio-economic data reported at the municipal level.

3. Much of the data collected by the National Census and Statistics Office (NCSO) were on a sample basis, making it impossible to attribute them to specific settlements or to use original field sheets to disaggregate data for barangays.

4. Some of the data were reported at different units over time, or the unit boundaries changed from one reporting period to the next, making time series or temporal comparisons difficult.

5. Much of the data available from technical reports, special BRBDP studies and national ministries were collected for specific purposes and communities and did not cover the entire Basin. Thus, many aspects of the analysis had to be based on "sample" studies of sub-areas within the Basin.

Moreover, there were other limitations to the information available. Accurate maps delineating towns and barangays

did not exist when the project began, and a good deal of time had to be devoted to locating and mapping settlements. Air photos were available for only about 10% of the Basin, and neither time nor money was available to complete the photo surveys. Thus, information concerning the location of boundaries of settlements had to be collected through field and key informant surveys. The excellent social surveys conducted by the Social Science Research Unit of Ateneo de Naga University--especially the Municipal Inventory, Transport Inventory and program evaluation studies--provided strong insights into various aspects of underdevelopment in the Basin, but they covered only Camarines Sur Province. Some of the studies had to be updated or extended in Albay Province in order to obtain complete coverage of the Basin. In addition, the unavailability of family income and employment data at municipal and barangay levels created serious analytical problems that were never fully overcome. Finally, except for some data found in the transport studies, virtually none of the existing information was useful for linkage analysis; transport linkages, market interaction, social patterns, service linkages and governmental relationships all had to be determined through original studies done on a sample or contracted basis by the project staff.

5. Use of a combination of analytical methodologies, and reliance on staff knowledge of the area under study. It became clear early in the project that, given the constraints of time and money and the need to develop a useful policy document, it would not be possible to undertake a comprehensive statistical analysis of the Bicol River Basin. Where comprehensive coverage could not be attained using existing or easily collected data, partial analysis, sample studies, and subarea analysis were done. Formal statistical analysis was supplemented, where appropriate, with more informal analyses, case studies, participant observation and interviewing of key informants. The staff was encouraged to be creative in developing analytical methodologies suited to the conditions and needs of the area. To the extent that the output of the project was to be a policy plan rather than a scholarly research study, the staff was urged to use a wide variety of techniques for obtaining information, and to cultivate and use their own knowledge of the region in arriving at judgments and conclusions.

Although a large number of possible analytical techniques were suggested in the Rondinelli-Ruddle report, the project was not designed to test a pre-selected set of methods. Design of the analytical methods and

techniques evolved during the project as opportunities and constraints became apparent, and were selected on the basis of criteria outlined above. Under any conditions, heavy reliance on multivariate statistical techniques seemed questionable given the types and quality of data available and the purposes of the study.

The staff accepted the necessity of using a variety of formal and informal, "hard" and "soft," analytical methods, and the application of their own judgment to the study, although they were initially skeptical and somewhat uncomfortable without a preselected and predesigned approach. Their initial reaction was that one or two statistical techniques would provide the "answers" and that conventional regional analysis methods should simply be applied in the Bicol. Indeed, in the early stages of the project, statistical methods were often used as "crutches," in that manipulation of numbers was substituted for hard thinking and conceptualization about spatial systems in the Basin. To some extent both reactions were mitigated as the project progressed and the staff saw the limitations inherent in each statistical technique they tested and the need to use methods of analysis as a way of testing conceptions and preliminary judgments rather than to provide unequivocal "answers" and irrefutable conclusions.

In retrospect, there was no alternative to managing the project as an experimental venture and to designing the methodologies and techniques to meet the needs and conditions found in the Bicol River Basin. No preselected package of techniques would have fit the unique conditions of the Basin. Many analytical techniques that were thought to be important for analysis at the outset had to be discarded either because of lack of available data or because they yielded inappropriate or useless results. Location quotients for economic base analysis could not be calculated, for instance, because of the lack of employment or production statistics; coefficients of segregation and Gini Concentration ratios could not be determined for many socio-economic indicators, and distance-accessibility analysis proved not to be applicable or relevant in the context of rural underdevelopment found in the Basin. Even some standard techniques of analysis such as centrality indexing were not helpful; computer calculated Guttman scales proved futile given the limited capacity of Philippine computers and lack of trained manpower. In each instance, the staff had to fall back on descriptive and manually-calculated techniques. Overall, however, this provided a strong learning experience for most of the staff;

doing short field surveys, hand-calculating results, manually constructing scalograms, and testing alternative statistical techniques forced the staff to think seriously about the types of data needed, the worth of the data, the cost-effectiveness of gathering more, and the meaning of the results in terms of the conditions they observed in the Bicol River Basin.

Moreover, the initial exercise of inventorying all existing data prior to designing analytical techniques and collecting additional information--although it required much more time than originally estimated--yielded an important output: the first comprehensive statistical compendium of social, economic, demographic and physical information, disaggregated to the municipal level, that had been done in the Bicol. It categorized data from a myriad of sources that heretofore had been scattered in specialized technical reports. This compendium alone should provide an important planning tool for the BRBDP and other government agencies within the Basin, and eventually can be used to assist in making private sector investment and location decisions. Finally, the exercise yielded the first comprehensive settlement map of the Bicol River Basin which identified and located barangays. Again, this should provide BRBDP planners with a valuable tool for future planning, and when combined with the analyses of municipalities, functional complexity of settlements and indicators of linkage, can be used to make more informed and effective location decisions.

Analytical Methods and Techniques

Following the general principles outlined earlier, and considering data availability and the limitations on extensive new data collection, the following types of analyses were used in the Bicol project:

1. Preparation of a socio-economic, demographic and physical profile of municipalities within the Basin as an inventory, comparative analysis and baseline study. Data were compiled and disaggregated to provide a comparative profile of social, economic, physical, institutional, physical and demographic characteristics of municipalities. Primarily descriptive, this aspect of the study made use of data on population size, density and composition, levels of dependency, literacy, educational attainment, conditions of dwelling units, size of municipal revenues, land area, crop production, value of production, and experienced work force. Also included

were comparative analyses of changes in population sizes of barangays, percent distribution of population by municipality, number and percent of households with lighting and toilet facilities, strength of construction of dwelling units, distribution of market receipts by municipality and distribution of agricultural resources. The types, numbers and distribution of productive and commercial establishments were compared by municipality as were the numbers and capacities of hospitals, educational institutions and service establishments.

Changes between 1970 and 1975 were calculated for selected indicators. For some data, location quotients were calculated, but lack of data on employment by industry limited the use of location quotients in analyzing the economic base of municipalities.

Municipalities then were categorized by level of development based on three derived analyses--ranking by levels of socio-economic and demographic characteristics, ranking by share of establishments, and ranking by transportation access. Quartile analyses were done for selected socio-economic indicators and weighted rank calculations were used to cross-check the results with the other analyses in arriving at three-level development categories for municipalities.

Coefficients of segregation and other distributional statistical measures were attempted, sometimes unsuccessfully, but the emphasis was on presenting the data in maps, charts and other graphic forms.

2. Analysis of centrality, functional complexity and the hierarchy of settlements. This component of the analysis was aimed at determining the extent and pattern of centrality within the Basin and at delineating the distribution, concentration and ubiquity of central functions and services. The methodologies included:

a. Guttman scale analysis of the 54 municipalities in Albay and Camarines Sur Provinces using 64 items (facilities and services) in eight functional categories. The categories and items included:

1) Economic--shopping facilities, banks and financial establishments (other than rural banks), appliance store, farm supply and agro-chemicals store, regular public market, rural bank, cottage industry, and agro-processing plants;

2) Social Services--nursing school, college,

vocational school, high school, private hospital, operational government hospital, private clinic, drugstore;

3) Communications--airport, port, train station, bus station, newspaper, radio station, telephone, telecommunication (teletype) station;

4) Physical Equipment Services- functioning power plant, piped water supply system, hardware supply store, farm equipment repair facility, subdivision, surveyor, construction supply store, auto repair shop;

5) Recreational--bowling alley, gymnasium/ auditorium, cinema with daily runs, night club, playground with facilities, cockpit, cinema with once weekly runs, paved basketball court;

6) Personal Services--cemetery, funeral parlor, optometry/optical shop, photo studio, hotel, lodging house, restaurant, xerox copying service;

7) Community Organization--"palawagan" (welfare institution), cooperative, credit union, sports association, professional organization, civic organization, labor union, farmers' association;

8) Extension and Protective Services--red cross, firetruck, police station, security agencies, BAI, BAEx, BPI, DLGCD.

While this exercise provided useful information concerning the functional complexity and concentration of various types of services and facilities in municipalities, its most important deficiency was that the "municipalities" are not discrete settlements, but administrative areas containing both urbanized centers and rural barrios. Thus, the municipal scale did not provide a ranking of functional complexity of settlements. To get a better indication of the hierarchy and functional complexity of settlements, the staff turned to two other methodologies: a Guttman scale of settlements and weighted centrality indexes.

b. A second scale, of urbanized or built-up areas, was done to rank settlements by functional complexity and to attempt to delineate a hierarchy of central places. The built-up areas consist of (1) poblacions

and contiguous barangays with approximately the same land use characteristics as the poblacion, and (2) other barangays within the municipality with a population size of at least 50% of the poblacion.

Neither the municipal nor built-up area scales, however, distinguished barangays as discrete settlements. Indeed during discussions it became clear that many barangays might, like municipalities, be only administrative areas rather than viable settlements. And since accurate boundaries for many barangays could not be determined, population density criteria had to be eliminated. It was decided, instead, to test the Census definition of settlements: poblacions and other barrios with at least a population of 1,000 in which the occupation of the inhabitants is predominantly non-farming/fishing and which have:

> a) street pattern, i.e. network of streets in either parallel or right angle orientation; b) at least 6 establishments (commercial, manufacturing, recreational and/or personal services; and c) at least three of the following: (1) a town hall, church or chapel with religious services at least once a month, (2) a public plaza, park or cemetery, (3) a market place or building where trading activities are carried on at least once a week, and (4) a public building like a school, hospital puericulture and health center or library.

All barangays not meeting these minimum population-physical facilities criteria were considered to be non-central rural places and would be treated as a group at the lowest order in a hierarchy of functional complexity. A survey was later done of all barangays, which confirmed the validity of this judgment. A scale was then computed for all settlements.

c. Another complementary exercise to obtain an indication of centrality was the calculation of weighted centrality indexes for all settlements. The staff devised a method of adapting Marshall's centrality index, assigning weights on the basis of ubiquity of functions. The procedure is as follows: 1/

(1) Reproduce Guttman's largest scale in an

1/ Junio Ragragio, "The Design for the Identification of the Hierarchy, Centrality and Thresholds of the Central Place Systems in the Bicol River Basin," discussion paper, Urban Functions in Rural Development Project, 1977.

inverted form with cases arranged vertically and items horizontally;

(2) Total each row and column;

(3) Using the assumption that the total number of functional attributes in the entire system has a combined centrality value of 100, determine the weight or "location coefficient" of the functional attribute by applying the formula:

$$C = t/T$$

where C = the weight of functional attribute t
t = combined centrality value of 100
T = total number of attributes in the system;

(4) Add one block to the table and enter the weights computed;

(5) Reproduce another table similar to that in step 1 displaying the weights calculated in step 3 and the total centrality values;

(6) Sum the weights of each row to produce the indices of centrality.

Tables 8 and 9 illustrate the calculation of the centrality index. The centrality index allowed use of attributes or functions that appear as errors in the Guttman scale based on the assumption that the presence of "rare" functions in an otherwise lower scale center does contribute to its centrality.

d. Scalogram analysis was also done to supplement the Guttman scales of municipalities and built-up areas. This is primarily a graphic and nonstatistical version of the Guttman scale that arrays functions by ubiquity and ranks settlements by functional complexity. The Guttman scales calculated by a computer program, presented two major problems for analysis in the Urban Functions project, other than that of not meeting the objective of using methods limited to manual operation. First, the functions that seemed to be of most interest for rural development--farm equipment repair shops, vocational schools, credit unions, rural banks, farm supply stores, etc.--did not scale and were eliminated in the scale scores by the computer. Second, the computer output was difficult to understand and could not be easily presented to show the distribution of

Table 8 Calculating Weights of Functions

Functions

Places	1	2	3	4	5	6	7	8	9	10	Total
A	1	1	1	1	1	1	1	1	1	1	10
B	1	1	1	1	1	1	1	0	1		8
C	1	1	1	1	1	1					6
D	1	1	1	1	1	1		1			7
E	1	1	1	1	1						5
F	1	1	1	1							4
G	1	1	1								3
H	1	1	1								3
Table No. of Functions	8	8	8	6	5	4	2	2	2	1	46
Total Centrality	100	100	100	100	100	100	100	100	100	100	
Weights	12.5	12.5	12.5	16.6	20	25	50	50	50	100	

Table 9 Calculating Centrality Indices

Value of Functions

Places	1	2	3	4	5	6	7	8	9	10	Total
A	12.5	12.5	12.5	16.6	20	25	50	50	50	100	349.1
B	12.5	12.5	12.5	16.6	20	25	50		50		199.1
C	12.5	12.5	12.5	16.6	20	25					
D	12.5	12.5	12.5	16.6	20	25		50			
E	12.5	12.5	12.5	16.6	20						
F	12.5	12.5	12.5	16.6							
G	12.5	12.5	12.5								
H	12.5	12.5	12.5								
Total Centrality	100	100	100	100	100	100	100	100	100	100	1,000

functions by place.

The statistical presentation required detailed explanation and interpretation, which technically untrained policymakers--at least those attending the Bicol technical workshops in which the method had been presented--found difficult to understand. Nor did they immediately see its relevance.

A graphic scale used successfully in India and Indonesia was adapted for the Bicol study. All settlements were included--a total of 1,419 built-up areas and barangays. The technique resulted in a graphic presentation illustrated in Figure 8. 2/

The procedure is as follows:

(1) On the left side of the worksheet list settlements as rows in descending order of their populations;

(2) Across the top as columns list the institutions found in the region in order of their decreasing ubiquity;

(3) Draw row and column lines so that the worksheet becomes a matrix in which each cell represents an institution that may appear in the settlement;

(4) Fill in with a dark color all cells which represent an institution actually found in a settlement. What results should look like Table 3;

(5) Reorder the rows and columns so as to visually minimize the eight holes appearing in the dark pattern found in the upper left. The scalogram is complete when no shifting of a settlement row or institution column can reduce the number of holes in this pattern;

(6) The final order of settlement rows identifies a ranking of settlements which can be

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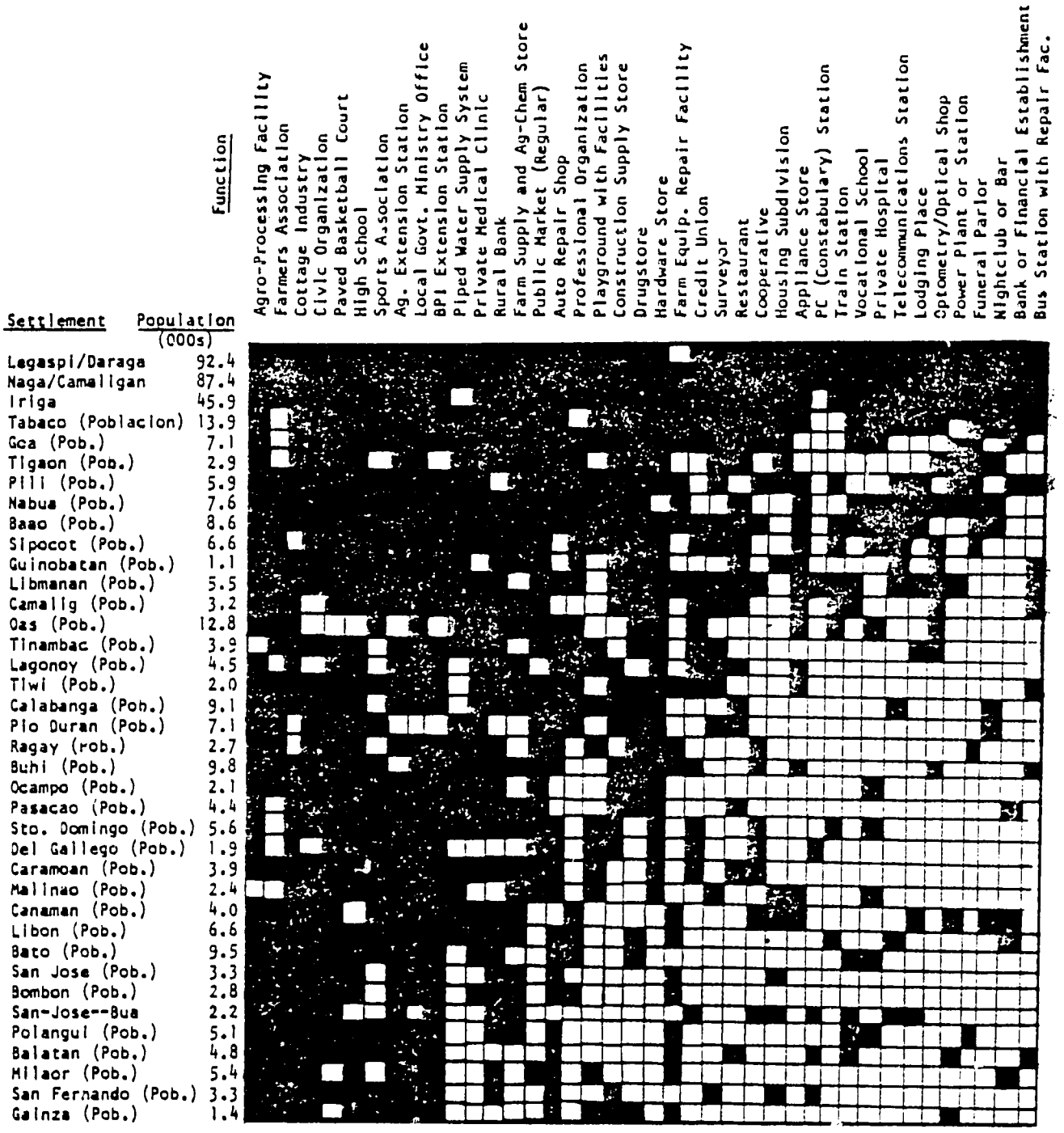
2/ See C.P. Andrade, S. Banerji, H.B. Fisher, G. Rushton, N.S. Saini, A. Sharma, A Graphical Approach to Settlement Planning for Integrated Area Development Planning, mimeographed, no date; and H. Benjamin Fisher, "Methods for Identification of Agro-Urban Centers at the Kabupaten and Provincial Levels," mimeographed, (Jakarta: Ford Foundation, 1975).

Figure 8

SECTION OF A SCALOGRAM FOR "BUILT UP AREA" SETTLEMENTS, BICOL RIVER BASIN



Preliminary Draft Version

Function Present
Function Absent

interpreted as an ordinal centrality score.

As Fisher notes, "the scalogram provides a visual description of the...settlement and institutional hierarchy that is easy to read and useful as a reference in analyzing numerous issues for planning." This observation was confirmed in the presentations at technical workshops, where both technically trained personnel and local political leaders examined an initial version of the scalogram prepared for the 120 settlements at the "top" of the hierarchy.

Among the potential uses of the scalogram in regional planning are the following:

(1) It can be used to categorize settlements into levels of functional complexity and to determine the types and diversity of services and facilities located in individual places and in various levels of the hierarchy;

(2) The scalogram shows rough associations among services and facilities in specific locations and potential functional linkages among them;

(3) By reading any particular column one can see the degree of ubiquity of a service or facility and its distribution over places in the region;

(4) For particular services or facilities requiring supplementary support services and facilities, one can determine the existence of preconditions by examining the diversity of items present in any particular community;

(5) In conjunction with a map showing locations of the functions appearing on the scalogram, and with population-service criteria, quick approximations can be made of the adequacy of service and facilities distribution for the region;

(6) "Missing," or unexpectedly present, functions are clearly identified;

(7) Rough indicators of threshold for some items can be determined from scalograms showing the population size of settlements;

(8) The scalogram can be used as a general reference in making decisions about locating services and facilities in order to increase potential access for

communities within various levels of the hierarchy.

The scalogram has definite advantages over the Guttman scale in that it is easy to construct and to interpret, requires no sophisticated training or equipment, and can be easily updated and revised using either "windshield surveys" or more systematic reporting schemes to obtain data on the presence or absence of services and facilities.

3. Threshold analysis. In order to obtain approximate indications of population sizes required to support services and facilities in settlements of the Bicol at the present time, the staff adapted Marshall's approach to threshold analysis.

Marshall argues that "the threshold is that size of center which divides the ranked list of centers in such a way that the number of centers lacking the function above the division is equal to the number of centers possessing the function below the division." The method is especially appropriate to analysis of rural regions and to the type of data already collected for scalogram analysis, in that it requires only a ranked listing of settlements and the presence or absence of functions. Marshall suggests a modification on the general rule: "Once a threshold has been determined, this threshold (and the function to which it applies), will subsequently be disregarded unless at least half of all the centers above the threshold size possess the function in question."

The staff adapted a procedure which is illustrated in Table 10:

(1) Construct a table with a rank listing of centers according to population, a corresponding list of population data and the presence (1) or absence (0) of every function in each of the centers listed;

(2) Apply Marshall's rule and identify each function's population threshold; and

(3) Apply Marshall's supplementary rule and disregard functions eliminated by this process. 3/

There were, however, definite limitations on the use of

3/ See John U. Marshall, The Location of Service Towns, Toronto: University of Toronto Press, 1969.

this technique. Current threshold levels may not realistically represent the potential for settlements of various sizes to support services and facilities, and may reflect locational decisions not based on market considerations or on development obstacles that have prevented services and facilities from being efficiently located in settlements that do have the required population sizes to support them. The technique does offer a "quick and dirty" means of calculating the thresholds for currently available services and facilities, however, and was used in conjunction with other methods of estimation.

Table 10

Calculating Threshold Levels for Selected Functions

Rank of Center	Pop.	Function A	Function B	Function C
1	10,000	1	1	1
2	8,000	0	1	1
3	6,000	0	1	1
4	5,500	0	0	1
5	3,000	0	0	1
6	2,700	1	1	0
7	1,900	0	1	1
8	1,700	0	0	0

Linkage Analysis

Analysis of linkages remained partial and descriptive because of the large amount of original research that would have to be done in order to do a complete mapping of physical linkages and thorough investigation of socio-political relationships in the Basin. Yet, through sample surveys and synthesis of socio-economic studies already done in the Basin, the staff made substantial progress on obtaining information that provided useful insights into how activities located in various settlements are related to each other and the interaction patterns among locations within the basin. (See Figure 9.)

1. Transportation and Physical Linkages. The staff

Figure 9

URBAN FUNCTIONS PROJECT LINKAGE ANALYSIS DESIGN

CATEGORY	TYPE	INDICATORS
A. Physical	1. Road Networks	a. Road distances between municipalities b. Types and conditions of roads c. Origin-destination study d. Traffic count - Passenger count e. Transport facilities per link, derived from BRBDP Transport Study
	2. River Transport	Quick survey of major river stops, upstream and downstream--goods and passengers carried, purpose of travel, river boat types and capacities
	3. Rail	a. From Philippine National Railroad data - types and volume of freight, passengers, distance between stations, locations of stations and stops, frequency of trips b. Quick survey on skates - types and volumes of freight and passengers, points of origin and destination, types and capacities of skates, frequency of trips per link
	4. Irrigation System	From National Irrigation Administration data - types of systems, hectarage, crops grown, production and productivity, map of systems (if any), probable expansion of system (on map), number of farms served, number of households, number of farmers.

Figure 9 (cont.)

CATEGORY	TYPE	INDICATORS
		number of people, organization for system management, water fees, actual payments and delinquencies.
B. Economic	1. Market Patterns for agricultural products and manufactured commodities	a. From Transport Study - commodity flow b. Quick Survey on 6 major market centers to determine origin-destination of goods sold and bought (reach of market). c. Periodic markets - location, market days, variety of goods, number of retailers, commodities traded
	2. Farm Inputs	a. Farm credit - sources, types, volume from Central Bank Reports b. Quick survey of fertilizer, pesticides and farm machinery - dealers, repair shops - types and location, volume (if available)
	3. Capital Flows	From Central Bank - distribution of commercial credit and capital investment
	4. Manufacturing Linkages	Quick survey of manufacturing establishments - inputs, outputs, distribution of manufactured goods, location, employment, capitalization, types
	5. Shopping Patterns	Analysis of travel patterns in Transport Study.

Figure 9 (cont.)

CATEGORY	TYPE	INDICATORS
C. Population Movement	1. Migration	a. From NCSO special studies, 1960, 1970, 1975
	2. Journey to Work	b. Analysis of Intermodal Transport Study and SSRU Study on "Where People Go?"
D. Technological Linkages	1. Telecommunications	From Bureau of Telecommunication (DPWTC) - telephone and telegram systems, franchise area, number of subscribers, links between systems, volume of long distance calls (and destination of calls), charges and rates, map calls made
	2. Media	From Radio Control Board data - for radio, TV stations, location and reception areas, and listenership. For printed media, type, circulation
E. Social Links	1. Visiting	SSRU study on "Where People Go?"
	2. Marriage Patterns	Survey from marriage licenses filed with municipal civil register on origin of brides, of town grooms for the last 2-5 years. Map information as links from that town to origin of brides
F. Service Delivery	1. Electric Power	a. Map of electric power grid (from NEA, NPC), no. of subscribers, rates charged, source and type of power plant

Figure 9 (cont.)

CATEGORY	TYPE	INDICATORS
	2. Education	b. From DEC - location and type of schools, enrollment for last 5 years, service area of schools (origin of students), number of classrooms and special facilities
	3. Health	From DOH and Provincial Health Office - location and type of health care facilities, number of patients treated and their origins, types of diseases/ sicknesses, number of beds, number of doctors and nurses
	4. Professional Services	From SSRU Municipal Inventory (Camarines Sur only)
G. Political, Administrative and Organizational Linkages	1. Government political subdivisions, structural relationships	From Local Government Code - summarize levels of formal gov't. subdivisions, how they are related, their authorities decision-making powers, functions
	2. Budgetary Flows	Municipal tax revenues and uses for the last 5 years; about 5 actual cases of extent to which municipality depends on higher levels for budgetary assistance

Figure 9 (cont.)

CATEGORY	TYPE	INDICATORS
	3. Informal political linkages and decision-making	a. Key Informant Survey among sample barangay Captains and Mayors on what are the key services and projects needed by their barangay or municipality and where they go for assistance
		b. About five descriptive cases on actual political decision making, who participates in decision-making and extent of participation such as location of projects, incorporation of barrios or towns into municipalities or cities, changing names, etc.

compiled information on transportation linkages among subareas of the Basin by mode, on road networks by conditions of road, and interpoint distances among barangays and between barangays and poblacions. In addition, information on traffic volumes, means of transportation and selected commodity flows was made available through various transportation studies conducted by BRBDP. The staff contracted for a survey of "informal" transport of goods and passengers by railroad "skates." Much of the data was mapped and provided a detailed profile of physical linkages among subareas within the Basin. In addition, data such as interpoint distances, which had not been previously compiled, will be useful for general planning purposes.

2. Economic and Market Linkages. The staff completed surveys of six regular markets--Naga, Iriga, Goa, Legaspi, Ligao and Tabaco--and six periodic markets within the sphere of influence of the major marketing centers. The objectives of the surveys were to determine the extent and origin of the flow of selected commodities into and out of major marketing centers, to estimate the physical "reach" of market centers for selected commodities, and to identify physical and functional linkages among producers, middlemen and buyers. In addition, the surveys provided some indication of the degree to which rural areas in the Basin are linked to urban centers through marketing interaction, and the degree to which market centers within the Basin are linked to external centers of exchange. Although the surveys were not a substitute for a complete market study--a prerequisite to thorough mapping of linkages between rural areas and urban centers--they did provide indications of linkage and raised important questions for analysis and further research. By surveying periodic markets, information was also gathered on linkages among producers, lower level intermediaries, and major market middlemen. The sample for six major markets included 100 middlemen and 50 producers, who were interviewed with prepared questionnaires. Information was obtained on the source and destination of commodities, type of seller, place of sale and volume of trading for rice/palay, corn, sugar, abaca, copra and coconuts, vegetables, poultry, livestock, fish, manufactured goods, medical products, applicances and household items, school supplies, agricultural and veterinary products, farm implements and cottage industry goods. Similar information was garnered from periodic market middlemen. The survey was limited to public markets and did not include private

stalls located adjacent to the public markets.

Information on each commodity's source and destination and mode of transport was mapped, showing linkages among places within the Basin and between market centers within Bicol and those outside. These data were analyzed along with data compiled from commodity flow studies done for BRBDP transportation and secondary road project feasibility studies. Information was also obtained on the location of periodic and regular markets in Albay and Camarines Sur, total market receipts for public markets, numbers of stalls, frequency of operation and market days.

3. Service Linkages. Again, it was not possible without extensive surveys of every type of service provided in the Basin to develop and map a complete set of service linkages. Short of a comprehensive services study, the staff did intensive surveys of two major type of services--health and education. A sample of institutions was chosen and information gathered on the origin of patients and students. Service areas were mapped and supplementary information gathered to provide indications of the degree to which such services are used by urban and rural populations and the degree to which they are accessible in terms of physical distance and cost. These intensive surveys were supplemented by another study of government services conducted by the College of Public Administration for the administrative-political linkage analysis.

4. Social Linkages. The staff identified the major social linkages important in the Bicol River Basin, including kinship patterns, marriage patterns and visiting patterns. Much of the information concerning social linkages, however, could not be easily quantified. One study, of marriage linkages, used town records to determine the origin of brides and grooms. They provided insights into the social linkages among places, which in turn provided information on one dimension of kinship and visiting patterns. Other indications of social linkages relied on secondary studies such as those conducted by the Social Science Research Unit in Naga and by Philippine sociologists and anthropologists who have conducted research in the Basin.

5. Administrative, Political and Governmental Linkages. The nature of relationships among levels of government within the Bicol, formal and informal political and administrative decisionmaking, the

linkages among and between government units in the provision of services and facilities, and the characteristics of the network of planning organizations affecting development policy within the Basin were some aspects of administrative, political and governmental linkages explored in a study subcontracted to the College of Public Administration at the University of the Philippines.

It is clear from experience with the Bicol project that replications in other countries or applications in other regions should make greater provision for original research studies than were made in the Bicol project if their staff is to obtain more extensive indicators of linkages among settlements.

RECOMMENDATIONS FOR FOLLOW-UP ACTIVITIES

The Bicol River Basin Urban Functions in Rural Development Project yielded a number of important outputs in addition to those envisioned in its design. Beyond establishing a planning process for spatial analysis and a plan for integrated urban-rural development, the project also generated:

1. The first comprehensive statistical compendium of social, economic, demographic, institutional and physical characteristics of municipalities and settlements in the Bicol River Basin that should provide an important statistical base for future analysis and planning;

2. An inventory of available data sources on various aspects of social, economic and physical development in the Basin;

3. A number of small sample surveys and original research studies on various aspects of interaction and linkage among communities within the Basin, including a survey of selected markets, analysis of transport access, delineations of service areas of major centers for various types of social services and facilities, a cultural history of Bicolanos and a cultural analysis of subareas within the Basin, a profile of government organization and the dynamics of political interaction, and an analysis of travel patterns in relationship to economic interaction among settlements, all of which can be useful to planners in broadening their understanding of the region and its people;

4. A series of analytical maps and overlays for various developmental variables and linkage indicators that can be used as baseline and comparative analytical tools for planning the location and distribution of services and facilities;

5. The first comprehensive map identifying and locating settlements below the municipal and poblacion levels, including all barangays within the Bicol River Basin;

6. Construction of a scalogram of major services, facilities, organizations and infrastructure for all barangays within the Basin that can be used in making

allocation and location decisions, selecting existing and incipient centers for development, and developing "minimum packages" of investments for various communities;

7. A core of trained manpower capable of applying, revising, modifying and updating the spatial analysis methodologies and techniques used in the project for future planning in the Bicol River Basin and for replication in other regions of the Philippines;

8. Institutional capability within the CPDS of the University of the Philippines--Los Banos to apply spatial analysis for integrated spatial development;

9. A body of literature, generated from the Rondinelli-Ruddle Urban Functions in Rural Development conceptual study, a series of "spinoff" and working papers on various aspects of integrated urban-rural development, Bicol working papers and staff reports, and a series of statistical studies on the Bicol, much of which has already found its way into training programs and graduate courses in various programs within the University of the Philippines, and which will be used in the education and training of Philippine social scientists, planners and administrators for a number of years into the future; and

10. Increased awareness and sensitivity among BRBDP planners, USAID Mission staff in the Philippines, technical personnel of national ministries working in Bicol and local political and governmental leaders, of the importance of spatial aspects of development, the necessity of taking deliberate action to integrate urban and rural areas in regional development programs, and the significance of urban functions in rural economic, social and physical development.

Although the project accomplished its major objectives and generated a set of outputs beyond those anticipated in the original Project Agreement, some important follow-up tasks and supplementary activities should be seriously considered by USAID. Among them are the following:

1. Institutionalization of the Planning Process Within the BRBDP. Following the completion of the final plans and reports on Urban Functions in Rural Development in the Bicol River Basin, there remains the task of institutionalizing the planning process and methodologies within the planning and programming activities of the Bicol River Basin Development Program. The

spatial analysis was to be not only a substantive contribution to planning activities within the Basin, but also a "demonstration" of a planning process that would continue after the Urban Functions project was completed. The task remains of defining an appropriate means, and of establishing effective organizational arrangements for continuing spatial analysis as part of BRBDP activities. Obviously, the data compendium must be revised at regular intervals, the scalogram will need updating periodically, and the spatial system will have to be re-analyzed at least once every five years. At this time, the BRBDP does not have a staff or department that does this type of analysis. USAID should take appropriate action to encourage and assist the BRBDP to adopt the spatial analysis planning procedures developed during the project within a reasonable period of time after the project's completion.

2. Dissemination of Results within the Philippines. A briefing package should be developed by the BRBDP, the USAID Mission in the Philippines, and the CPDS to disseminate the findings of the Bicol Urban Functions project to local governments, provincial planning and development officers, NEDA Region V planners, the national government ministries operating within the Basin as well as to other appropriate organizations. Although the final report provides details of the findings and methodology, more concise oral briefings will have to be made if the results are to be disseminated widely within the Basin and the Philippines. Although the Urban Functions staff and CDPS can take initial responsibility for developing a briefing package and conduct the first round of briefings, continuing responsibility for such activities will have to be assumed by the Bicol River Basin Development Council and its staff when the project ends.

3. Translation of Macro-Spatial Analysis into Project Identification and Location Criteria. The Urban Functions project in the Bicol was primarily a "macro" study of the distribution of urban services and facilities and it could not deal with specific location decisions or project identification questions in detail. The results of the spatial analysis and their implications for project identification, location decisions and project analysis must be translated, through further micro-analyses based on the findings of the Urban Functions project, into specific programming and location criteria. Unless this is done the impact of the Urban Functions project will be limited and the "multiplier effects" will not be substantial. Perhaps a follow-on project, funded in part by USAID and in part by the

Government of the Philippines, would be the most effective way of organizing and continuing the transition from macro-spatial planning and analysis to micro locational analysis and project identification work that must follow from the Urban Functions study. In any case, if USAID becomes involved, follow-on activities should be jointly funded. It would seem unwise for the U.S. Agency for International Development to fund such a project without substantial inputs of manpower and resources from the BRBDP, since the project would be heavily oriented toward manpower training and the establishment of administrative procedures, both of which require intimate participation by the BRBDP staff.

4. Dissemination of Results by USAID. If the Bicol project is to fulfill its objective as a "pilot project" of testing procedures, methods and organizational arrangements within an integrated spatial development framework, then the Office of Urban Development must transfer the experience from this to other pilot projects and to other appropriate development activities. This will require more than merely distributing copies of the Bicol final report to other pilot project participants. As soon as possible after completion of the Bicol final report, USAID should organize an intensive workshop to bring together key staff members from the Bicol project with key staff members of the other pilot projects to share and relate experiences, and to determine the replicability or adaptability of methods and procedures.

5. Supporting Research by USAID. The Office of Urban Development should begin now thinking about research and development activities needed to make the Urban Functions in Rural Development project successful on a broader scale.

One obvious need is for additional research into the roles of market towns and intermediate size cities in developing countries, which the Bicol project has confirmed are two of the most important components of spatial systems in rural regions for equitably distributing urban services and facilities in support of rural development. Unless more is known about the roles these settlements play in development and how their growth can be stimulated, it will be difficult to translate the findings of the spatial analysis into specific policy, program and project recommendations.

A second obvious need is to develop additional pilot projects for translating regional macro-spatial analysis

into micro-locational and project identification activities. Given the experience with the Bicol project, it seems unwise to combine both of these activities in a single project, since they involve work that is sequential, they involve conceptual and methodological approaches at two different scales, and they require complementary but different analytical and planning skills. Moreover, both are relatively complex, and each is somewhat experimental. Both sets of activities require the full attention of the staff at the time they are being done. It would seem more fruitful to make them shorter-range, sequential but separate projects, rather than single long-term activities.