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PARTNERSHIP IN DEVELOPMENT

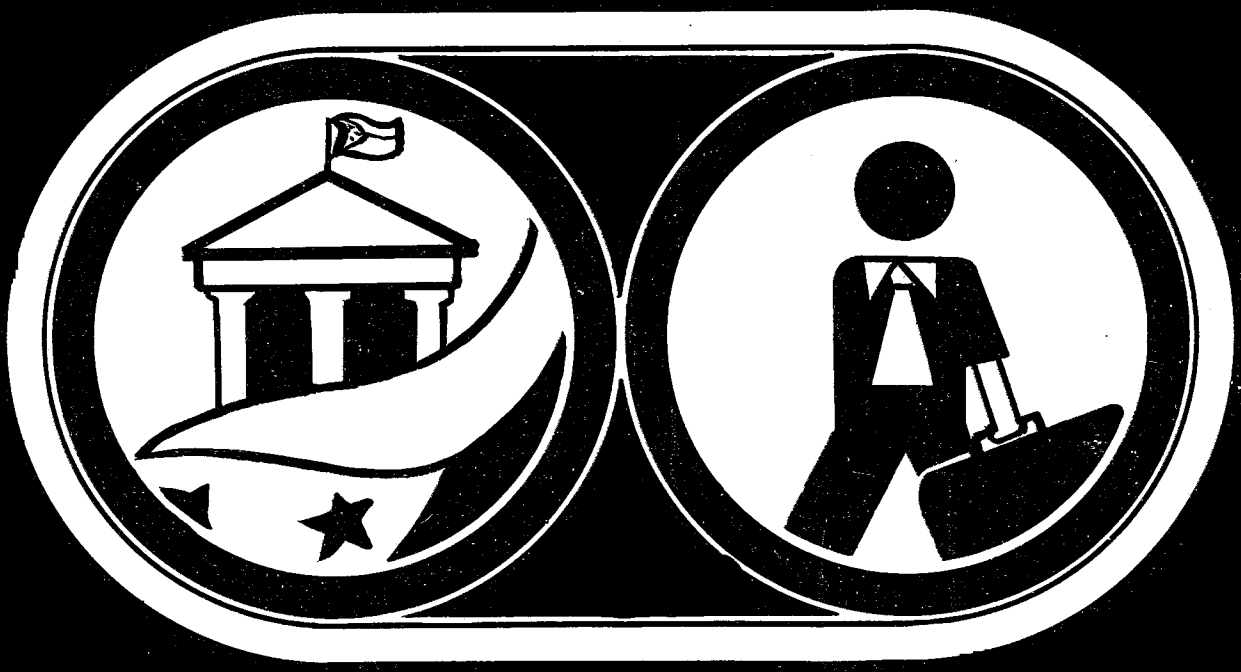

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Table of Contents

Editorial :

partnership

An atmosphere of intense technological exchange pervades the relationship between nations and groups in an effort to minimize the cost of utilizing the earth's resources for the maximum benefit of mankind. This spirit of sharing is reflected in the growing partnership between the technologically superior countries and the relatively underdeveloped nations that are understandably anxious to push their societies toward rapid industrialization.

In the Philippines, this kind of relationship is widely observed wherein foreign consultancy groups are contracted to undertake, jointly with the government, sophisticated development projects. The Metropolitan Manila Land Use and Transport Development Project (MMETROPLAN) and the Pampanga Delta/Candaba Swamp Area Development Project are two of the more ambitious government projects where both local and foreign groups pool their expertise together.

Within government itself, the old practice of one agency going about its business in isolation is now being abandoned in favor of inter-agency tie-ups in nearly all development projects. No longer can one agency lay exclusive claim on a project realizing that development problems are inter-related, highly complex and at times unpredictable.

More and more government agencies are learning to share their manpower and other resources to maximize results. This inter-agency cooperation is underscored in the on-going partnership between the University of the Philippines Institute of Environmental Planning and the Department of Public Works, Transportation and Communications. Their cooperative endeavor, established in 1972, has given rise to the organization of the Planning and Project Development Office (PPDO) which office is the usual choice of UPIEP students for their apprenticeship. The office eventually absorbs them after graduation. To date, about 30 percent of PPDO's staff are UPIEP graduates. Thus, while the DPWTC is providing a rich training ground for planning graduates of the UPIEP, it has at

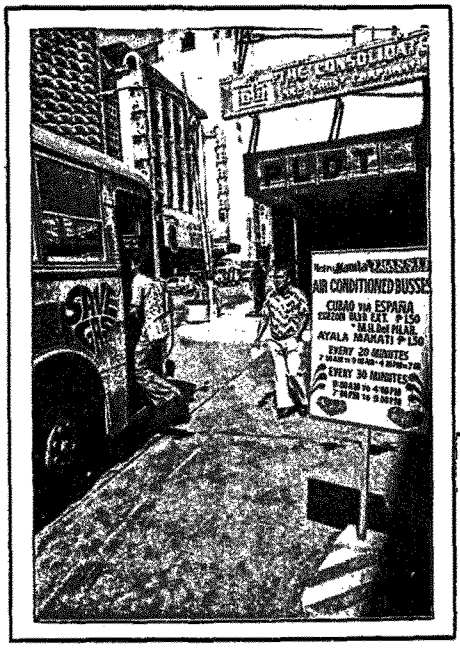
the same time an enviable access to qualified planners who are largely responsible for the agency's success and effectiveness.

In the same vein, national agencies and local governments are now forging partnerships in areas of mutual concern.

The government, too, is currently laying emphasis on a working partnership with the private sector. In a number of major government projects the services of local planning, consulting and management groups are being availed of. Examples are the National Government Center Development Complex where private planning firms are commissioned to prepare the master site development plans; the Bicol River Basin Development Program utilizing the expertise of the Economic Development Foundation; and the Metro Manila transportation projects which draw the active participation of the Metro Manila Transit Corporation and the Bus Operators Association of the Philippines.

The situation at the outset may be strewn with problems and difficulties. For one, the profit motive that animates the private sector usually conflicts with the social orientation of the government. But surely one sector has a lot to learn from the other. In the end, a harmonious chord might be struck between contrasting viewpoints and conflicting interests through meaningful partnerships in the task of development.

in development



MMETROPLAN

Private Enterprise
And The Government Sector

The theme of this issue of the *Philippine Planning Journal* is a consideration of the partnership between private enterprise and the government sector in the process of development. This particular article concerns itself with a partnership between private enterprise and Government Departments and Agencies not in the field of actual development but in the field of planning, particularly the provision of consultancy services.

One aim that is always uppermost in a partnership that has been set up to undertake development is to harness constructively both the profit motive of the private sector and the social and economic responsibilities of the government sector in order to elicit from the conflict of interest that will inevitably arise a balance that provides the community at large not only with what it needs in terms of new facilities, new buildings and new roads, but also manages to do this in a way that makes sound financial sense and achieves it in as short a time scale as possible.

Partnership
In Development Planning

A partnership that has been set up to plan for development can have a similar aim in that the private enterprise element, in this case the consultancy, is subject to the dictates of financial efficiency not usual in Government, and this brings a different approach and style into decision making.

There are a variety of situations where a Government body may call in consultants, though usually more than one of these are involved in a single case:

1. The partnership can be used simply to provide additional manpower at a time when a Government Department is fully committed with an on-going work.

2. The partnership can be used to furnish skills and expertise that do not exist or exist only to a limited extent in a Government Department. This can happen when an Authority is suddenly faced with additional powers and responsibilities that it did not previously have, or when, for example, a new technique has been developed or a skill is required on an *ad hoc* basis.

3. A further opportunity that can be met by a partnership is when an Authority itself wishes to develop particular skills and expertise and can learn these from working with an organization that can provide them.

4. Other advantages that may be derived from government partnership with the private sector stem from the latter's relative independence from the administrative machinery.

METRO-MANILA TRANSPORT, LAND USE AND DEVELOPMENT PLANNING PROJECT

● DAVID PINNOCK

a. It may be able to provide a more independent view of a problem being faced and of the merits of the alternative solutions to the problem.

b. It may, by virtue of its being outside the established bureaucratic hierarchies, be able to gain access to top Government Officials more easily, and to speed up the planning and implementation of the task faced.

This is not to suggest that the benefits by any means accrue solely to the Government. The private sector gains as well, in terms of an insight into the objectives and responsibilities of Government; an appreciation of some of the administrative constraints to development; and not least of all, the opportunity to fully communicate its ideas to those who will be concerned with implementation.

A Current Example: MMETROPLAN

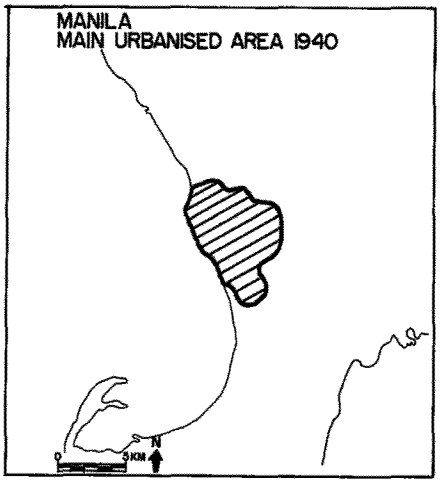
In Manila at present, a major development planning project is being undertaken as a partnership between a Government Department, in this case the Planning and Project Development Office (PPDO) of the Department of Public Works, Transportation and Communications, and a private company, a Planning and Transportation Consultancy Agency from Britain, Freeman Fox and Associates. The project is being carried out by a joint team from the two organizations involved and in close liaison with a large number of other Government Departments and Agencies. This article describes by reference to this current project the working arrangement that has been established. It offers some thoughts about this type of arrangement.

The Scope Of The Project

The project itself is called MMETROPLAN, with two M's, a reference to the now widely accepted name Metro-Manila. Its main purposes are threefold:[1]

- To provide a general framework for the future development of the country's biggest single urbanized area – Metro-Manila;
- Within this framework, to prepare policies and a programme for investment in transport; and
- To prepare an action programme designed to effect immediate improvements which would be complementary to the general framework for future development.

[1] For more detailed description of the project, its aims and working method, refer to the Project Team's Inception Report produced in February 1976. Available at the Department of Public Works, Transportation and Communications, Marsman Building, Port Area, Manila.



The project is placing emphasis on transport for two reasons: (1) transport is an urgent priority in Metro-Manila at the present time and (2) the project has been commissioned by a Government Department with a prime responsibility for this aspect of urban infrastructure. However, it attempts to go beyond the transport problem. It seeks to make a contribution to the coordinated attack that is needed in the urban development problems of the Metropolitan Area.

Metro-Manila suffers from some acute problems – of poor housing, urban poverty, flooding, transportation and by no means least, very rapid population growth. A general framework for the future development of the area must of necessity attempt to tackle these problems, but it must also attempt to provide a means by which the needs and aspirations of the people who live and work there can best be met.

In the case of MMETROPLAN, the attempt will not be to predict how Manila may look like in say 25 years' time, or to identify an ideal to strive for. It will be more of an effort to define a realistic set of measures or policies, that can be implemented in the order of priority, to cope with the existing problems of Metro-Manila, to provide for its future growth and yet still leave sufficient flexibility to cope with problems that may not rise to the forefront until later. It is very sobering to reflect that Manila and the problems that were facing it in 1954, just 22 years ago when the previous Master Plan[2] was produced, were very different from the vast Metro-Manila and the problems it faces today. It is also worth bearing in mind that in the four years or so that it may take to get a major measure underway to contend with both current problems and the expected level of growth, the urban population could have grown further by a million people.

The second of the aims listed above is to prepare policies and a programme for investment in transportation. It is no longer possible, if it ever was, tc separate transport from the other elements of urban development. They are inextricably linked. This aspect of the project has to be seen therefore in its widest context as an important part of the total urban development process. Planning for transport in Manila needs a thorough understanding of how the Metropolitan area works, why the things that are happening do happen, and how they are likely to change in the coming years. Congestion and the other elements of the traffic problem are themselves symptoms, but the disease is different since it concerns economic growth, income distribution, and the relationship between land uses such as homes and workplaces. Treating the symptoms alone will not suffice without astute diagnosis of the disease and preventive treatment. Transport is the concomitant of an exchange economy and as such is essential to the working of the city.

The third of the aims of MMETROPLAN is to launch an immediate attack on some of the more urgent problems. For what credibility can planning for the future have if the problems of today cannot be tackled? Two examples of opportunities for immediate action are greater rationalization of the existing road space and better use of the existing fleet of public transport vehicles. The necessary initiatives on these two fronts can be taken to have immediate effect without any need for major expenditure or delay in the construction of new road infrastructure, or the purchase of new vehicles. This is not meant to suggest that the latter two courses of action are not valid, but merely to stress that immediate action can, if desired, be taken right now to improve the quality of life in Metro-Manila – not only in the field of transport but in other fields such as relieving the problems of urban poverty or promoting more opportunities for recreation.

Organization Of The Project

The joint working team for the MMETROPLAN project has been set up on the basis of a

[2]The Master Plan, City of Manila, Philippines. Prepared by the National Planning Commission in 1954. Published by the Manila Bureau of Printing in 1956.

one-to-one matching of staff. The team is headed by two Joint Project Coordinators, one from the PPDO and one from the consultants. The Coordinators are, as their title suggests, responsible for coordinating the work of the project team both internally and with outside agencies. Responsible to the Joint Project Coordinators are the two Joint Project Directors. These again have been selected on the same basis that flows through the whole staffing management — one from the Government Department and one from the consultants. At the next level of responsibility are the individual teams, one dealing with strategic development and transport planning, the other with immediate action planning. Again team members are matched, with Government Officials and consultants staff working side by side.

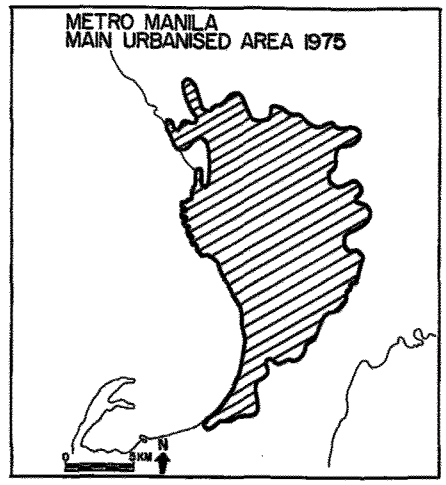
The permanent teams are further serviced by specialist advisers and consultants — either in the case of the Government Officials, representing Departments and Agencies, or in the case of the consultants staff, representing specialist skills or expertise particularly relevant to the project. The whole project team is given guidance by and is responsible to a Steering Committee.

The intention is that by such a method it may be possible to blend essential local knowledge, methodological and technical expertise and experience of relevant lessons that may have been learned from previous projects with those of the consultants. From the consultants' point of view, local knowledge, an understanding of the administrative machinery, short cuts through red tape and references to other relevant work as well as simply an understanding of the Philippine perception of life, can be invaluable.

From the Government Officials' point of view, in the longer term, the main advantage may rest in the potential quality of the end result, and in the ability to see the project implemented. But at the same time it can provide the opportunity to learn skills and develop expertise that may not be readily learned locally.

How The Partnership Is Working

Like any partnership, the arrangement depends enormously on mutual respect and trust and, above all, for both parties to work hard to

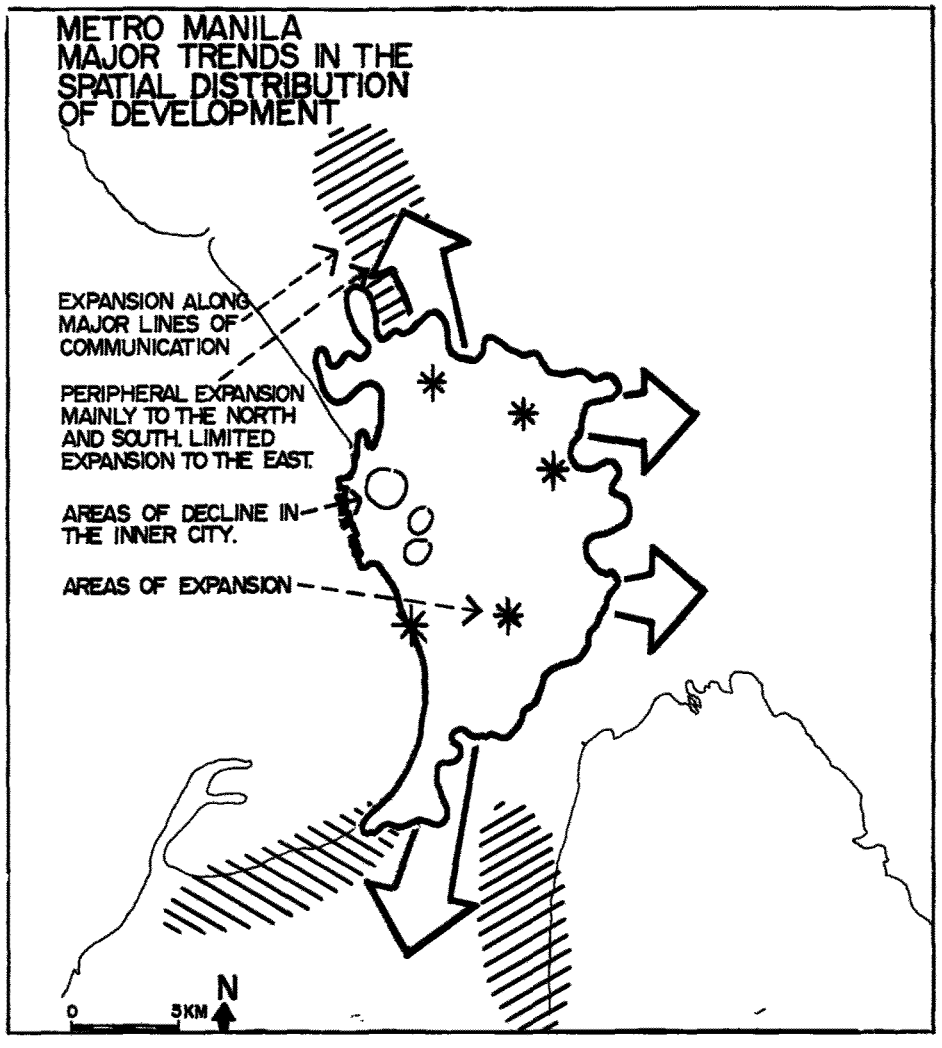


make the partnership work despite the difficulties and problems that will be encountered. There can be no denying the problems that have been encountered in the course of the project. Government Departments in developing countries are generally overstretched, i.e. they often do not have sufficient staff to allocate to vital posts; there can be quite serious cultural and communication gaps if the consultancy services have to be imported from abroad; the expectations of data availability can often be left sadly unfulfilled; and consultant and client may have fundamentally different views on the problems, priorities and solutions. All these are major worries that can lead and have led to dissatisfaction somewhere.

There is no denying either that in MMETROPLAN, the potential to be derived from the partnership is enormous. Problems, as and when they arise, are being met swiftly and efficiently, and mutual learning has helped to establish the right level of trust and respect that is essential for successful team working.

The project is due to last a year and is now nearly one third complete. The team has instituted a regular series of seminars which serve both as sessions to render reports of progress as well as opportunities for those not directly concerned with the project to understand and question the approach being followed. Some of these have proved useful, not only in performing their quasi-educational role, but also in providing a forum for the discussion of ideas, approaches to problems and possible solutions.

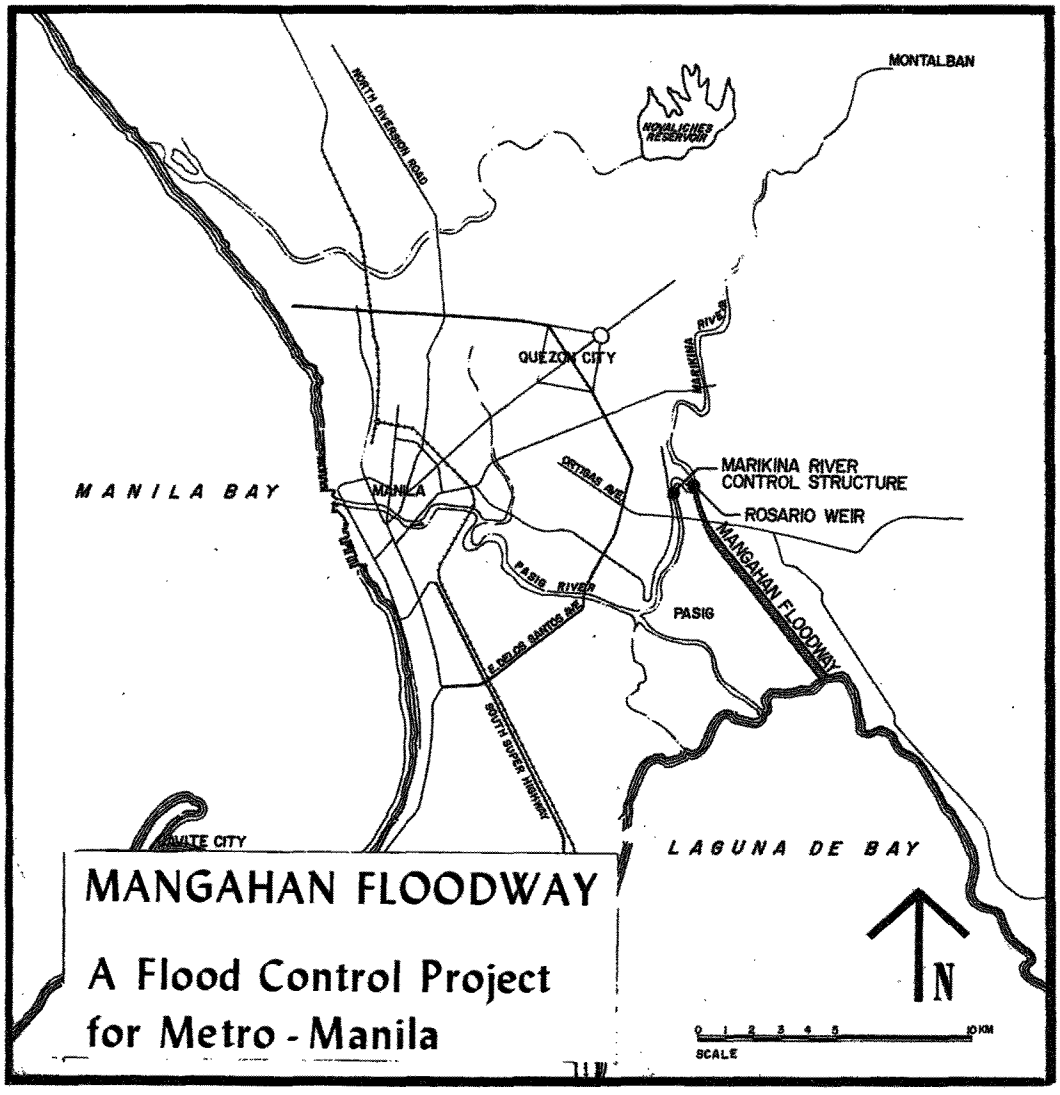
The project is basically one programme. Strategies are now being developed as part of



the process of providing a framework for the future development of the urban area; a transport model is being prepared; and a number of studies as the first essential step in preparing a programme of immediate action have been undertaken – one relating to Love Buses,[3] a second relating to the PNR commuter rail services, and a third to the commercial and market centre of Divisoria.

The project is, of course, still in its early stages. It is to be hoped that the present technical, intellectual and cultural partnership can satisfactorily lead to a practical solution of the very formidable tasks that face the area over the next few years. If it does, it surely will have fulfilled its expectations and made some contribution to the concerted programme of action that is needed in Metro-Manila.

[3] The Love Bus Survey – A MMETROPLAN Action Programme Report. An investigation into the success of the recent experiment to introduce high quality and comfortable air-conditioned buses as an alternative to the use of the private car in Metro-Manila. Produced in March 1976 by the Project Team. Also available at the Department of Public Works, Transportation and Communications.



WILLIAM L. HORN

The Philippine Government and an American Consulting firm, Daniel, Mann, Johnson, and Mendenhall (DMJM) worked together thru 1974 to find a solution to the flooding problem of Manila. In 1975, the solution had working drawings, and by 1976 it was ready for implementation.

The Government through one of its planning arms, the Planning and Project Development Office (PPDO) obtained a loan from the United States Agency for International Development (USAID) for conducting feasibility studies. This loan made it possible to bring to Manila a team of consultants that was to work with the government staff to bring to reality some ideas that had been toyed around for many years.

Flooding may be tolerated if not enjoyed in an area that is less densely populated. But to a city of high density and rapid growth like Manila, the inundation of homes and business establishments and the impassability of flooded streets are not only a nuisance but a significant economic loss.

There are two interrelated causes of the flooding of the city. One, local drainage and, two, the overflowing of the Pasig River. The flat city terrain is cut by a network of canals called "esteros" which constitute the main arteries of the city's drainage system. All storm drains, except those immediately adjacent to the banks of the Pasig River and to Manila Bay, lead to these esteros which in turn convey their discharge into the river or the bay. Over time many of these esteros through siltation and through encroachment into the channels by squatters, have lost their capacity to carry away the floodwaters. (A program was financed and started in 1974 to restore capacity to the drainage system and to build pumping plants at critical locations to aid in removing the unwanted water).

The major cause of the flood problem in Manila is the overflowing of the Pasig River. This river which bisects the city is the only outlet for Laguna de Bay, the large freshwater lake to the south and east of the city. Although it is not the lake that creates the flooding problem, its influence is felt in the hydraulic relationships that exist.

The source of floodwater actually is the Marikina River. This stream which heads in the Sierra Madre Mountains to the north and east of the city joins the Pasig River about six (6) kilometers below the lake outlet. The Marikina River, being an unregulated watershed stream carries its flood flows that result from the typhoons that pass over the area directly into the Pasig River. At this junction, the flows split. Depending upon the lake stage, the quantity of local drainage or the tidal level of Manila Bay, waters will flow both directions into the Laguna de Bay and into Manila Bay. When the lake level is low, Marikina flood flows which are in the order of 1,200 cumecs produce a stage of 130 meters at its junction with the Pasig River. At this stage which is about the present upper limit of non-damaging flow, the Pasig River will carry about 600 cumecs. However, flows of this magnitude occur every year so greater peak flows and higher lake stages immediately create a flooding problem in the city.

The Plan Of Development

The Mangahan Flood Control Project would divert the excess flows of the Marikina River into Laguna de Bay before it joins the Pasig River, thus eliminating the swelling of the Pasig River through Greater Manila and indirectly improving the effectiveness of the drainage network in the urbanized area.

The regulation of water flowing down the Marikina River is provided by three basic engineering elements: the Marikina Control Structure; the Rosario Weir; and the Mangahan Floodway.

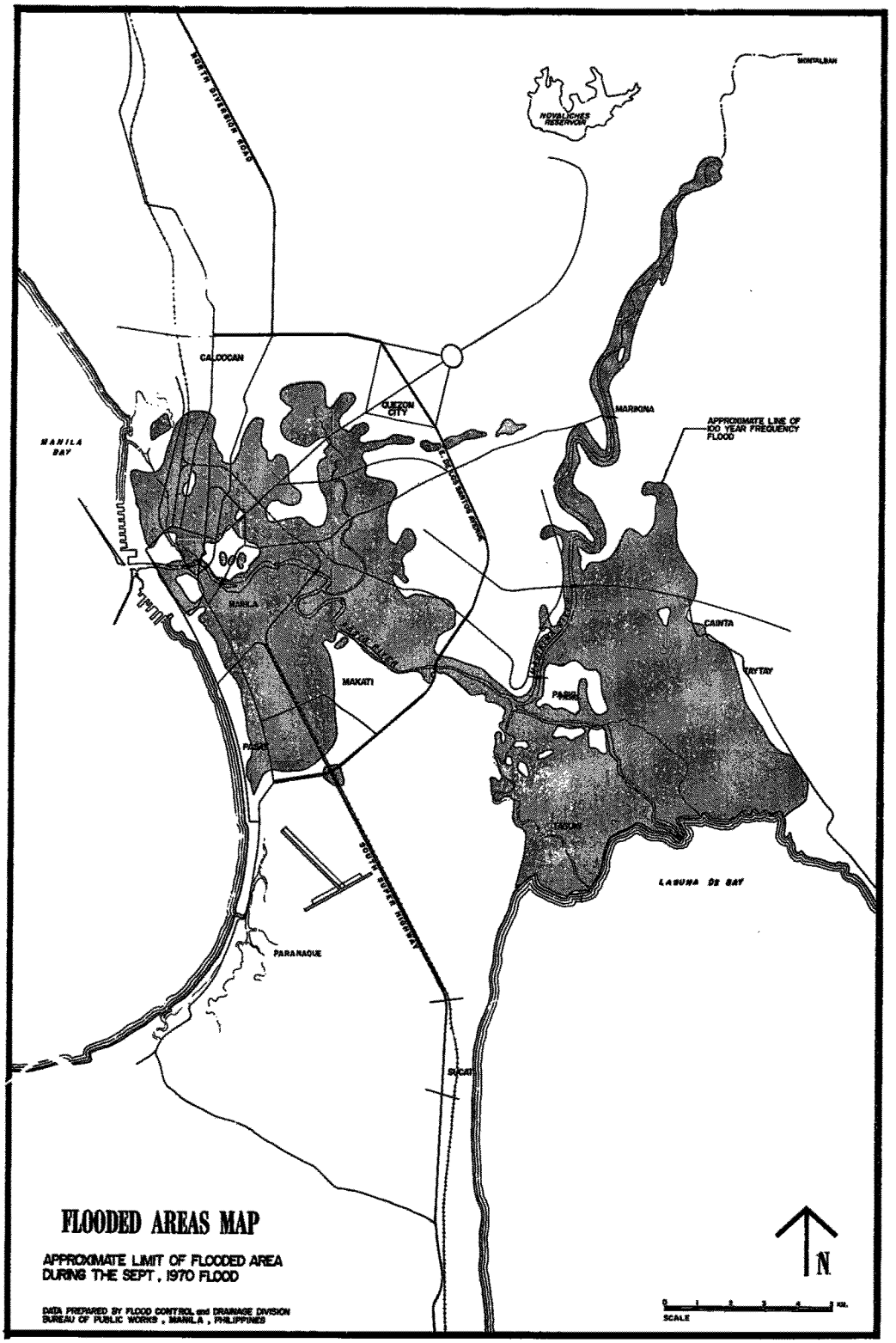
The Marikina Control Structure is designed to divert the Marikina flood flows over the Rosario Weir and then into the Mangahan Floodway. The dam structure would be a radial-gated dam about 75 meters in length and ten meters in height measured from the base of the stream bed. Each of five bays would contain a top seal radial gate. Cantilevered reinforced concrete retaining walls, both upstream and downstream of each bank, will form the abutments on each side. Suitable riprap protection will be provided in the channel and around the abutments to prevent scour. The five radial gates will be raised and lowered by cable hoists powered by electric motors.

Rosario Weir is designed to channel the diverted waters into the floodway. It is conceived as a concrete ogee-shaped crest weir, approximately 150 meters in length with a maximum head of 3.5 meters. Two five-wheel slide gates (10 meters wide by 3.5 meters high) would be built at the west end of the weir. In the closed position, the gates would act as an extension of the weir. The weir is designed to pass 2,400 cumecs with a head over the weir of 3.85 meters. This flow, in addition to 900 cumecs that will flow down the river, is estimated to have a recurrence interval of 100 years.

The proposed Mangahan Floodway would extend nine kilometers downstream from the weir to Laguna de Bay and would consist of three sections:

1. A 1,000 meter concrete lined trapezoidal section located immediately downstream from the weir with a bottom width of 80 meters and side slopes of two horizontal to one vertical;

2. A 1,000 meter grouted riprap transition section designed to prevent scouring and


NORTH DIVERSION ROAD
NOVALICHES RESERVOIR
MONTALBAN
CALOOCAN
QUEZON CITY
MARIKINA
APPROXIMATE LINE OF 100 YEAR FREQUENCY FLOOD
MANILA BAY
E. RODRIGUEZ SENIOR AVENUE
MANILA
PASAY
MAKATI
PASIG
CAINTA
TAYTAY
PATEROS
TAGUIG
LAGUNA DE BAY
SOUTH SUPER HIGHWAY
PARANAQUE
MUNTINLUPA
FLOODED AREAS MAP
APPROXIMATE LIMIT OF FLOODED AREA DURING THE SEPT. 1970 FLOOD
DATA PREPARED BY FLOOD CONTROL and DRAINAGE DIVISION BUREAU OF PUBLIC WORKS , MANILA , PHILIPPINES
N
SCALE

to provide energy dissipation. Velocity of flow through the transitions would be reduced from about 4.3 meters per second at the upstream end to about 1.5 meters per second at the downstream end in the event of a 100 year frequency flow of 2,400 cumecs through the channel;

3. A seven-kilometer earth channel of 118 meters bottom width and 8:1 side slopes. It is anticipated that serious erosion to the channel is not likely to occur even though the side slopes will be unprotected.

There is a fourth element to the Project, the Ortigas Bridge and Road. The Marikina-Rosario road presently traverses the area to be occupied by the Rosario Weir. In order to restore the road connection with the present thoroughfares, a new road to Ortigas Avenue and a new bridge would be constructed at the intersection of Ortigas Avenue.

Status Of The Project

The idea of the Mangahan Floodway as a solution to the flood problem in Manila was toyed around as early as 1948 by the Bureau of Public Works. Various other investigators in the intervening years have also considered the project as a logical and practical solution to the perennial flood problem. Early in 1974, funds were made available by USAID and the Philippine Government to prepare a feasibility report on this project. In February 1975, the feasibility study, a joint effort of PPDO and Daniel, Mann, Johnson and Mendenhall, an American engineering firm, reported the project as technically and economically feasible and recommended early construction. The National Economic and Development Authority (NEDA) gave the project a high priority for financing. So with these supporting data, the project was submitted to the Japanese Government for financing consideration. After due deliberation on the feasibility study, the Japanese Government agreed to support about one-third of the needed capital cost, the remainder to be financed by the Philippine Government.

In May of 1975, design of the project was initiated and in February, 1976, it was completed. In the design work DMJM joined with a Philippine engineering firm, Development and Technology Consultants, Inc. (DTCI). The same engineering firms jointly, but under supervision by government technicians, carried out the detailed steps in the preparation for construction.

Economics

One of the principal purposes of the feasibility studies was to determine whether construction of the Mangahan Floodway was in the national interest. It was known from hydraulic studies that the project would reduce flooding in Greater Manila by diverting damaging flood flows into Laguna de Bay. But before moving ahead with the construction it had to be proven that the benefits would exceed the costs.

To determine costs accurately enough to be weighed against benefits many of the factors that had previously been estimated or assumed were quantified. The project features were sized to fit new studies of flood flows and channel capacities. Some soils investigations were performed to guide the location of the structures and the foundation conditions that would be encountered. Quantities were taken and costs evaluated in the light of present price levels.

One of the most difficult physical problems requiring decision was selecting the shape and size of the seven kilometers of earth section. Over design, that is, considering removing large quantities of material would reduce potential flood flows to non-damaging amounts but would also raise the cost of the structures. Removing only minimum amounts of material might create erosion and deposition of material in Laguna de Bay. Obviously, a balance must be struck.

Benefits of the proposed project were based on the prevention of future direct and indirect losses in and around Manila due to the swelling of the Pasig River. Direct losses include the destruction of residential, commercial, industrial, agricultural and public properties whereas indirect damage induced by the floods are measured in terms of permanent loss of production, profits or income associated with the interruption of normal business activity during floods.

Project studies were fortunate in having flood damage surveys made after some major floods. The Department of Public Works had made these field surveys after the flood years of 1947, 1948, 1956 and 1970. The calculations and projection of damages indicated that by 1973 the average annual damage from flooding alone would rise to 40 million pesos.

In summary, the benefit-cost ratio for the project was computed to be 1.88 to 1 with an internal rate of return of 21.8%.

Costs And Financing

As the design took shape and methods of construction were selected cost estimates could be finalized. Some consideration was given to labor intensive methods of construction, but they were later abandoned in favor of standard practices after the method of financing was chosen.

Unit costs were determined for each of the individual construction activities and segregated into foreign exchange costs and costs eligible for a commodity loan. The total project is estimated to cost about 200 million pesos, 1976 costs, of which 126 million is eligible for foreign assistance of one form or another. Right-of-way costs and taxes are those items that must be locally financed.

As previously indicated the Japanese Government will finance the foreign exchange costs, which will consist of construction equipment and materials not available in the Philippines.

Planning Related To Flood Control Project

The lower Marikina valley through which the Floodway passes is also subject to continual flooding from the overflowing of the Marikina River, the backwater from Laguna de Bay, and from local surface runoff. It was logical to conduct some planning studies in this area as the design of the Floodway progressed, so that any interrelationship would result in cost savings for both the floodway and the land development that would ensue. Four basic questions were dealt with:

1. The design and cost of land reclamation adjacent to the floodway project;
2. The savings which may be realized through coordination of the construction phases of the planned Highway C-6 and Floodway;
3. The appropriate alignment of the Highway C-6 as it relates to the floodway and land reclamation; and
4. The policies and factors which should be considered in the future development of land adjacent to the Floodway.

The result of this planning effort identified 1,200 hectares of land that would materially benefit from the floodway. By an expenditure that would add approximately five percent to the overall project cost this area could be protected from all flooding and could provide an immediate benefit in increased agricultural production.

This work also showed that a major saving in construction costs would result if the priority assigned to Highway C-6 were adjusted to make use of the spoils from the Floodway.

In the future, the lands adjacent to the Floodway may be needed for urban development. Such a development should be planned as a whole and its development considered on the basis of regional need. Incremental, unplanned subdivisions should not be allowed.

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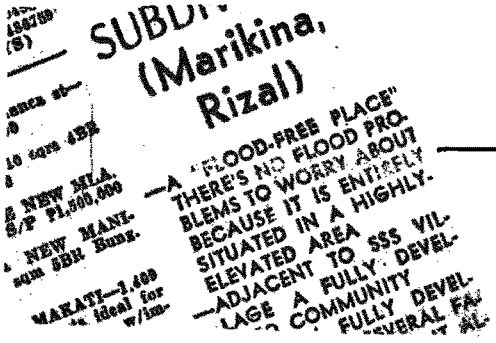
The present trend towards government and private sector cooperation in an effort to resolve the housing problem of the country is an offshoot of the importance now being accorded to issues of equity and welfare. For while a vigorous housing program will ultimately benefit the economy at large, this is hardly obvious except perhaps to the trained analytical eyes of government planners and experienced entrepreneurs.

Certainly the goal of improving the country's economic peformance is a much less ostensive motive than that of ensuring a better standard of life for workingmen, who, if not for such a trend, would have little hope of ever living in, much less owning, adequate homes. But while the motivations and pressures for housing programs for low-income groups may start from normative pronouncements — whether based on ethics or aesthetics — the transformation of the policy into reality calls for a deeper understanding of the economics of the problem and an analysis of the potentials of the government and the private sector to forge an effective partnership in responding to the challenge.

The Economics of the Housing Problem

There is a tendency when considering the housing problem to focus merely on the problem of the so-called housing backlog. It has been estimated by the National Economic and Development Authority (NEDA) that the total housing shortage now stands at roughly 3.8 million units. Adding to these the continuing need for new housing per year as population increases, it is easy to understand the magnitude of the backlog.



The housing problem, however, is not adequately measured merely by the backlog. There are other, more complex facets of the problem whose analysis will show the way towards effective policy-making and implementation. Let us consider the more important ones.

In the first place, the exact conditions of supply and demand are only inadequately represented by the backlog. The data on the demand for housing are too much on the aggregative side, lumping together economic or effective *demand* with a concept of housing *need* derived from a set of criteria whose applicability is questionable. The latter concept can be most troublesome, for the housing needs of certain groups have been posited using outside standards, *e.g.*, UN housing standards. No provision, for example, has been made to dichotomize the problem into rural and urban components. An yet it is clear that housing is a pressing problem only in the urban areas. At the same time, within urban areas, there is a need to further determine whether slum housing or occupancy of houses by more than one family should constitute part of the backlog.

Again a realistic appraisal of housing need *vis-a-vis* the opportunity costs of meeting international housing standards must be made. Housing experts may become too enamored by visions of well-planned physical lay-outs and orderly rows of Western-style houses and forget that in a developing country such as ours people will be willing to make do with what they have to enable more resources to be poured into *directly* productive agricultural and industrial activities.

Moreover, present efforts at changing the pattern of demand or making housing more easily available to low-income groups, are still lacking. It has been reported, for example, by the International Labor Organization (ILO) mission that only 20 percent of the P1,100 million put into housing in 1971 was provided through the two formal sources of credit – the Government Service Insurance System (GSIS) and the Social Security System (SSS). This implies that the bulk of construction must have been privately financed and therefore biased in favor of higher income groups. This is a reasonable conclusion since there exists no price control in the market. Thus funds for housing would have flowed to the high-income group market which is characterized by low risks and high rates-of-return. To make matters worse, government financing schemes have not been favorable to low-income groups either.

As ILO points out:

> The express purpose of these government schemes has been to expand low-income housing. In fact, however, it is the middle- and upper-income groups which are mainly being benefited. During the period 1962-72 the GSIS funds were used by 46,000 member-borrowers whose average loan was 23,000 pesos. Their number equalled about 8 percent of total membership of the GSIS in 1970 and their average monthly family income was within the range of 500-800 pesos which puts them among the highest earning 20 percent of all Philippine families.
>
> *– Sharing in Development p. 215*

Inter-relation with other Markets

It must also be noted that the housing market is closely linked with other markets in the economy. Thus the price of low-cost housing is necessarily influenced by the conditions obtaining in the construction industry, the speculation prevalent in the private urban land market, and the price of lumber and other materials which are linked to the foreign sector. Land speculation, for example, has tended to contribute a ratchet price effect to the over-all rising trend of housing costs.

These considerations serve to point out the importance of segmenting the market in terms of supply and demand and outlining its linkages with the rest of the economy. It is only through deeper analysis of the key segments of this market and the strategic elements of the private sector in market interactions that the government may pinpoint who its partners are and what the nature of that partnership ought to be. Special focus must be put on the sources of financing – the banks and other financial intermediaries; the construction and realty sectors; and, of course, the intended beneficiaries themselves – the squatters, slum dwellers, factory workers.

Government-Private Sector Partnership

Two aspects of the macroeconomic implications of vigorous low-income housing activity should also be considered to establish the rationale for government-private sector cooperation in policy formulation and program implementation.

First, is that the prime role of the government will lie in the field of financing. This has potentially problematic implications due to the contemporary inflationary pressures prevailing in the economy. Basically this means that the government can only go into limited direct financing unless it is willing to bear the costs of accelerated inflation. Related to this will be the cost of overburdening an already strained administrative machinery in the supervision of funding.

Second, to the extent that fund injections into housing activity accelerate investment in the related construction and raw materials industries, low-income housing may be seen to be an indirectly, if not directly, productive program with a wide-ranging impact on the economy. This is not unreasonable, for housing, compared with other industries, is less prone to generating inflation and much more biased toward creating employment.

Therefore it is clear that government alone cannot put up the necessary financing to cover present housing investment needs unless it wishes to gamble with inflation. Consequently, the situation calls for the government to create a system of incentives (or disincentives, as the case may be) biased in favor of low cost housing which will not unduly increase inflationary pressures. For instance, the private sector may be encouraged to shift assets in their investment portfolios from real estate speculation and other unproductive activities to housing.

Such an approach will also mean that instead of banking on centralized administration, the program will depend on a coordinated system of private sector involvement operating under an umbrella of financial and fiscal incentives. Finally, to the extent that the program may elicit cooperation in the industries and markets related to housing, the full benefits of the workings of the accelerator and multiplier principles will be realized.

Qualifications on Private Sector Involvement

Some of the implications of the analysis of market segmentation point out that within the private sector there are interest groups which, because of various motivations, will exhibit different propensities to engage in low cost housing programs for a given level of incentives.

Since the sectors in the economy which are directly concerned with construction rely mainly on speculative activities the government will have to set a system of priorities, concentrating on sectors which will be most responsive to low-cost housing projects. For example, institutions concerned with mortgage financing and real estate have to operate within specified profit margins. In the case of financing the government will have to allow the institutions to reach a certain profit level on the one hand, while delivering financing to middle- and low-income groups on the other. This may be accomplished by making home mortgages more liquid through a secondary market.

On the other hand, real estate groups thrive mainly on land speculation, and programs to elicit their active participation in low-cost housing would mean a substantial decline in their profit earnings. Thus the "partnership" of government with such sectors will take the form of disincentives like taxes on idle land to discourage such misallocation of resources.

In contrast to these groups, both local and foreign industrialists may be able to reconcile their goal of defending profit margins, stabilizing costs, and avoiding labor and community dissatisfaction if they can put the program of company housing into a long-run perspective. Such a program may be supported by the government by allowing for tax deductions. Thus firms will have to see short-run increases in costs as investments that promise returns in the form of a more productive and loyal labor force plus the unquantifiable benefits of improved community relations and a faster growing market.

Proposals to Operationalize the "Partnership"

Having considered the factors involved in defining the "partnership" – the housing market and its inter-relationships with other markets in the economy, and the varying potentials of interest groups within the private sector for low-cost housing – we may now turn to some concrete proposals.

** Strengthening Workers' Housing*

This has initially gained ground through P.D. 744, which requires all companies with 300 or

more employees to provide housing for their laborers. A package of fiscal and monetary incentives – such as tax deductions and priority treatment for group loans – should also be included in order to encourage more companies to participate in the low-cost housing program of the government.

This would in turn forge a closer relationship between management and labor – for example through trade union housing with financial support from management. Such programs will strongly depend on the responsiveness of business and workers' groups to the low-cost housing program.

** Organizing a Secondary Home Mortgage Market*

For the non-salaried workers who may not benefit from the above program, what is needed is a general shift of investment towards *social housing*. This may be accomplished through the creation of a secondary home mortgage market that would make social housing debentures liquid. Other things constant, this should cause a shift in private investment portfolios towards social housing.

Furthermore, government can also avail of the intermediation process of the secondary market to subsidize interest rates for social housing to enhance affordability.

** Reducing Unit Costs for Housing*

A general plan for making housing available to low-income groups must also include, aside from financing schemes, proposals that will reduce unit costs. Our observation of the interrelation of the housing market with the foreign sector shows that in order to reduce housing costs, attempts should be made to decrease the dependence of housing construction on imported materials. This should eliminate possible inflationary effects by saving on foreign exchange. At the same time, the use of local resources should be maximized.

Thus, the proposal calls for research on the use of indigenous materials for housing and developing adaptive technology for more efficient building systems.

** Integrating Housing as Major Component of National Development Programs*

National development plans should contain, as major components, provisions for adequate social services. For example, nationwide industrial estates should be developed alongside programs for adequate social services, particularly housing. This will help eliminate the diseconomies caused by uncontrolled urban sprawl in the form of slum and squatter communities.

To summarize, the proper perspective to take in formulating a program of partnership between government and the private sector will have to be based on a breakdown of the housing problem to establish the relevant scenario for action. By bringing to light the specific problems and potentials of the situation the government-private sector partnership may then take the forms dictated by the inherent interests and motivations of different groups within the private sector. Inevitably, it will be on the basis of a pragmatic realignment of these interests and potentials that effective planning and implementation may then take place.

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The Pampanga Delta-Candaba Swamp Development Project:

● *JONA BARGUR*

ABSTRACT

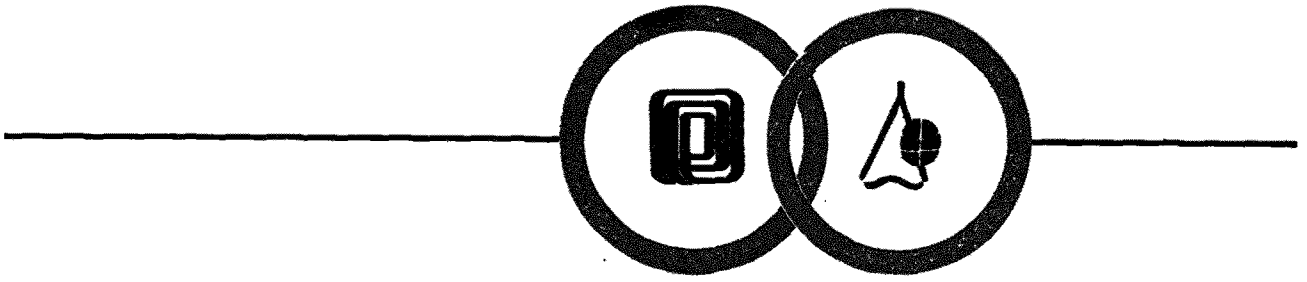
The urgency of drawing up a comprehensive regional development plan for the Pampanga Delta/Candaba Swamp Area in Central Luzon, Philippines, has been realized by the Government of the Philippines and various planning agencies since the 1972 flood in the area which caused a considerable loss of life and an enormous damage to property. The current study which is a continuation of a preceding one, provides insights into the socio-economic profile of the region, and into the major macro-economic determinants which serve as the fundamental data base for the overall comprehensive planning effort assumed by the planning agency and the consultant. Simultaneously, it attempts to identify the major problems which deter the region from assuming its valid socio-economic role consistent with its resource potential. These relate mainly to over abundance of water during the wet season causing major flooding and inundation and to water scarcity during the dry season preventing the efficient exploitation of the productive potential of land and human resources in the area.

A hierarchical multi-level planning approach has been formulated for the comprehensive planning phase following a hierarchy composed of overall regional, sectoral and project development levels.

However, a preliminary extensive analysis of the land and water resource base has been performed and a tentative balance of resource availability for the project area within the boundaries of the entire river basin has been drawn up. Preliminary proposals for the development framework of land and water resources have been formulated and high priority projects have been tentatively identified to constitute the initial planning phase of pre-feasibility studies.

[1] A UNDP Project performed by the Planning and Project Development Office (PPDO), of the Department of Public Works, Transportation and Communications (DPWTC) and Tahal Consulting Engineers, Ltd.

An Effort in Comprehensive Regional Planning[1]



I. Introduction – Background Information

The Pampanga Delta Area Development and the Candaba Swamp Area Development were two separate projects which came about as a result of the devastating floods of 1972. These two projects were pinpointed as priority areas among the twenty (20) identified projects seeking rehabilitation and development assistance. The selection of the delta and swamp area was further strengthened by the first report of the Manila Bay Metropolitan Region Strategic Plan designating the two areas as deserving special consideration for the formulation of a comprehensive plan. Accordingly, these two projects were submitted to the United Nations Development Programme (UNDP) for assistance.

A large-scale UNDP assistance was further sought to support the Government's effort to meet the rehabilitation and development needs of the delta and swamp areas. A project proposal designed for the detailed studies of the hydrological characteristics as well as the socio-economic development potentials of these water-logged areas was submitted to the UN in September 1974. Following this, the two projects were integrated into one which was approved under UNDP/PHI/74/015/A/13/01, the Pampanga Delta/Candaba Swamp Area Development Project. The Planning and Project Development Office (PPDO) – Department of Public Works, Transportation and Communications (DPWTC), was proposed as the main planning and implementing agency with the National Economic and Development Authority (NEDA) as cooperating agency.

In July, 1975, the Tahal Consulting Engineers Ltd., was finally selected after evaluation of several contracting firms to execute the pre-feasibility phase of the project. The team leader of the Tahal group arrived in the middle of November and immediately started the operation of the project.

The general goal of the study is to establish strategies and plans for the rehabilitation and development of the Pampanga Delta/Candaba Swamp Area on a comprehensive and multi-sectoral basis, i.e., to study the rehabilitation and development needs of the Area, to outline an integrated planning policy and prepare a comprehensive plan for the medium and long-term rehabilitation and development of the Area, and to identify urgent high priority projects, and conduct pre-feasibility studies of such projects.

To carry out these goals, specific operational objectives have been set namely:

1. Initiate proper land uses and development so as to attain efficient agricultural and fishery productivity, raise farm incomes to the desired level, and strengthen the link between the urban and rural sections of the Area.

2. Increase per capita income and equitably distribute wealth through generation of more employment opportunities and manpower development, in order to improve the quality of life.

3. Improve the efficiency of physical and social infrastructure support functions through better control and management of floods, better quality and use of water, sufficient and systematic transportation systems, planned patterns of human settlement sites and activities, and efficient administrative machinery.

II. The Planning Approach — Conceptual Formulation of the Regional Comprehensive Analysis

The project studies for the Pampanga Delta/ Candaba Swamp Area have two basic objectives: the first, to select the most desirable of the various sectoral and sub-sectoral programs put forward for the Area at various times, to make improvements where possible, and to synthesize them so as to establish the most desirable comprehensive overall development plans for the area; the second, to identify and advance the implementation of individual high-priority projects within the frame of that overall plan.

The establishment of the overall plan has been conceived to be based on a hierarchical approach which decomposes the problem into sub-problems at various levels and coordinates the solutions of the sub-problems at higher levels, while maintaining an overall optimum for the whole system.

However, since this comprehensive analysis is rather time consuming and requires a reasonably detailed data base, it was necessary to resort to short-cut techniques to be introduced by a project-oriented approach, in order that actual development and implementation should not be held up until the comprehensive plan has been fully established. By means of this approach it was possible to establish certain features, as forming part of the entire spectrum of alternatives, so as to serve as criteria for the selection of high priority projects at an early stage of the study.

Concepts of Hierarchical Planning Approach

In order to maintain a comprehensive interdisciplinary approach it seemed to be necessary to resort to mathematical modeling which enables the planner to formulate quantitatively a complex system of physical socio-economic interdependencies and to establish their simultaneous relations to the planning goals.

While these modeling techniques have the advantages of comprehensiveness, simultaneity, and consistency, certain difficulties are involved such as the determination of the nature of inter-relationships, the intensity of the quantification and the generality of the conclusions.

In order to overcome these drawbacks without having to give up quantification or having to resign oneself to a considerable loss of resolution, an iterative hierarchic modeling approach which provides for an overall consistent marginal analysis of the regional planning spectrum was adopted.

In the hierarchic modeling, a number of models are grouped together and inter-related in such a way that the output of one serves as the input of another, more specific model. The hierarchy is the level of aggregation: the model at the top defines the demands of each sector, while sectoral models define the level of activity in each sector, and ultimately screening models are applied to select the project within each sectoral plan. With this approach, the various sub-systems of the overall system may be defined with the highest level of quantification and resolution.

The rationale for the application of the hierarchical planning approach to regional development scheme stems from the following three facets:

a. The multi-objective nature of the problem;

b. The complexity of the inter-relationships between the planning variables augmented by characteristic non-linearities; and

c. The formulation of the system by means of a large-scale model of high dimensionality and very large number of variables.

The multi-objective analysis is a generalization of traditional efficiency-oriented benefit-cost analysis. It permits the recognition of many objectives such as regional income, environmental quality, and other relevant issues; and it is the explicit accounting of these objectives in the program design that requires the formulation of a multi-objective planning

function. The classical notion of simple scalar objective function, such as minimizing cost function, is not valid any more for the formulation of regional, or river basin development strategies. Optimal solutions in the sense of vector optimization, Pareto optimum or satisfaction, are not only desirable but essential.

The complexity of the inter-relationships between the planning variables, and the fact that many inter-relationships cannot actually be classified as linear, pose another solution consideration. A major shortcoming and deficiency of the classical engineering practices is that they often resort to linearized models and thus resulting in an imbalance between system modeling and system optimization. The decomposition and multi-level hierarchic approach permits the employment of non-linear, multivariable dynamic models.

Finally, the large scale character of these systems might justify the decomposition of problems into several sub-problems in order to achieve conceptual simplification, to yield a reduction in the dimensions of the problem by means of solving several sub-problems of lower dimensions, and thus to reduce the computational effort.

"The concept of the multi-level, decentralized or hierarchic approach is based on the decomposition of large scale and complex systems and the subsequent modeling of the systems into 'independent' sub-systems. The planner, or the systems analyst, may employ this approach to analyze and comprehend the behavior of the sub-systems at lower levels and to transmit the information obtained to fewer sub-systems at a higher level up to the decision maker. New variables which are called 'pseudo-variables' are formulated so as to uncouple the joint variables of two or more sub-systems at a lower level in the hierarchy. They are then added to the overall system as equality constraints and satisfied at a higher level in the hierarchy via Lagrange Multipliers or other coordination schemes. Each sub-system is then independently optimized, with perhaps different optimization techniques being applied, based on the nature of the sub-system models as well as on the objectives and constraints to the sub-systems. This is the lowest level solution.

"The sub-systems are joined together, coupling the variables manipulated at a second or higher level. An optimal solution of the whole system is thus derived."[2]

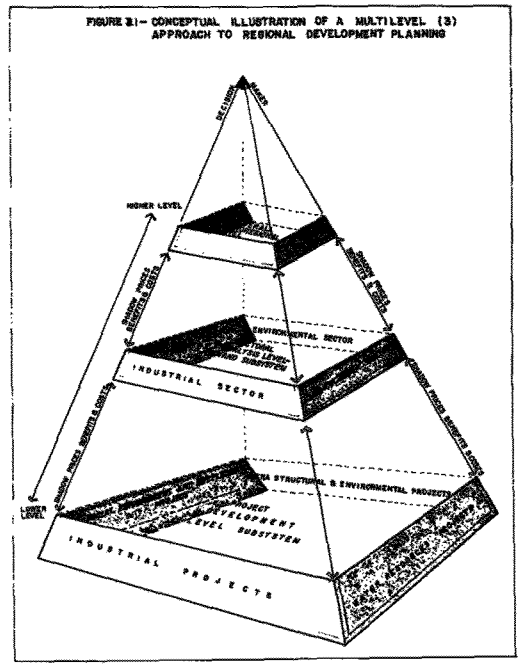


FIGURE 2:1 – CONCEPTUAL ILLUSTRATION OF A MULTILEVEL (3) APPROACH TO REGIONAL DEVELOPMENT PLANNING

A conceptual illustration of a three-level hierarchical model applicable to the Pampanga Delta/Candaba Swamp planning approach is presented in Figure I.

It is the availability of the hierarchical multi-level approach which enables the planner to model and study small sub-systems, local goals and objectives, at the lower level, to yield ultimately an optimal solution to the system as a whole, thus making the task both feasible and tractable.

The Planning Model

The planning model applied to the Pampanga Delta/Candaba Swamp Development Project conforms with the hierarchical planning concept described above.

The modeling system follows a hierarchy, consisting of four levels of planning, commencing with a highly aggregated level to establish the overall comprehensive regional plan. This level, the macro-analysis level, feeds into the succeeding level, the sectoral plans level, i.e., the formulation of the sectoral development

[2] Hierarchical Modeling of Regional Total Water Resources Systems. Automatica Vol. II, 1975.

programs-agricultural, fisheries, industrial, commercial services, utilities, housing, transportation, recreational, and public services programs. This level constitutes, actually, the demand aspect of the plan.

The succeeding level is the project development level, where specific development projects and action programs are outlined and analyzed, consistent with the sectoral plans of the higher levels. This constitutes the resource supply aspects. Finally, a scheduling and phasing level is undertaken to derive the specific timing of the project's implementation employing the economic time preference criteria, prevailing market discount rates or social overhead discount rates and projected requirements of the region.

The linkages between the various levels are in terms of derived shadow prices and marginal values (downward direction) and marginal benefits, costs and development characteristics (upward direction).

A set of surveys, studies, data collection efforts and computational procedures provides the data base for the analysis.

Each planning level within this hierarchy is consist of some major planning models, data requirements and computational and processing procedures as follows:

A schematic outline of the conceptual approach and the operational program of the study is given in Figure 2.

The application of the planning approach and the models as described above can be evaluated in terms of the following aspects:

a. *Overall Logical Consistency* — The planning approach inherently provides for logical, consistent cross checking.

b. *Sequential Decision-Making Process* — By means of the definition of various subspaces or sub-systems of the overall system, thus reducing the dimensionality of each subproblem, a logical sequential decision-making process is derived. National or regional goals are formulated at the highest level of hierarchy — the overall regional model. Then subjecting the overall, high-level model to constraints originating in the sub-models results in trade offs in terms of marginal values and shadow prices between the magnitude and weight applied to the major sub-systems which may in turn be transferred for decision making by the policy maker. A succeeding sequence of decision results from a more detailed formulation of the sub-systems in terms of a detailed balance between the resource

Table 1

Number	Planning Level	Planning Models	Data Requirements
1	Overall Regional	Input-Output (Positive; Normative)	(Aggregated Socio-Economic data)
2	Sectoral	Land Allocation	(Soil Survey (Production Functions
		Crop and Fish Production	(Socio-Economic (Indicators
		Location-Transportation	(Impact Studies
		Urban and Environmental	(Community Welfare (Studies (Ecological Studies
3	Project Development	Hydrometeorological Simulation	(Water Resource Data (Geological and Soil (Erosion Data
		Project Identification Procedure; Conjunctive Use of Ground and Surface Water Model	(Cost Data (Benefit Estimates (Environmental Impact (Statements (Water Balance Studies
4	Scheduling and Phasing	Supply Scheduling Model	(Cost Estimates (Discount Rates (Present Worth, (Internal Rate of (Return and Marginal (Cost Analyses

base and the demand space. Explicit decision problems are undertaken on an action plans' basis or project oriented basis within the lowest level of the hierarchical model.

c. *Analysis and Synthesis* — The hierarchic approach as described above actually provides answers to the integration of detailed analysis and an overall synthesis.

The analysis is iterative, subdivided into two phases. In the first phase the sub-systems have been defined and preliminary assumptions have been made about their mutual inter-relationships. Each of the sub-systems is thus analyzed and alternative solutions and a sub-optima established. In the second phase, the analysis of the sectoral and overall systems is undertaken with results obtained from the first phase. This analysis results in new information about the mutual inter-relationships of the sub-systems.

This procedure enables the planner to synthesize the final and intermediate development goals, being linked to physical and environmental constraints, to economic considerations and to the adaptability of the human resources and their demands.

Operational Application of the Approach

It is with these concepts that the planning procedure for the comprehensive analysis of the Pampanga Delta/Candaba Swamp Development Project was formulated and applied empirically.

The study was initiated simultaneously from the highest level in the hierarchy, the macro-overall regional analysis, and from the lowest level, the analysis of the resource base, mainly land and water resources.

The regional analysis was employed along the following lines:

a. Macro-economic accounting to derive the base year Gross Regional Domestic Product and its Final Demand components in terms of private and public consumption expenditures, capital formation or investments consisting of construction outlays and durable equipment, and regional trade balance, i.e., commodity outflows and inflows.

Preliminary estimates were established, total outputs or production were derived and compared to the corresponding figures on the aggregated national level to provide a base for comparative analysis of the major valid macro-economic determinants as follows:

Table 2

DERIVATION OF GROSS REGIONAL DOMESTIC PRODUCT FOR PD/CS for 1970[3] (at current prices — million pesos)

Component	Philippines	PD/CS
Household Consumption Expenditures	28,488	928
Government Consumption Expenditures	3,375	65
Gross Domestic Fixed Capital Formation	8,590	47
Trade Balance	−126	−343
Exports	7,961	152
Imports	−8,087	−495
Total Expenditures	40,327	697
Net Factor Income from Abroad	−800	
Statistical Discrepancy	1,131	
G.N.P. (G.R.D.P.)	40,658	697
Family Income	23,714	694
Gross Output — (Value of Production)	95,000	1,170
Population (1000)	36,685	1,031

Table 3

COMPARATIVE PER CAPITA ANALYSES OF MAJOR MACRO-ECONOMIC DETERMINANTS[4] (Pesos)

Specified Determinants	Philippines	PD/CS
G.N.P. (G.R.D.P.)	1,103	676
Personal Income	565	673
Personal Expenditures	773	921
Government Expenditures	92	63
Capital Formation	234	45
Gross Output	2,596	1,134

[3] Preliminary rough estimates, valid for comparison of magnitude of order.

[4] Preliminary Estimates to be revised.

The detailed derivation of these estimates follows the structure of the National Input/Output Table for the Philippines for 1969. The derived data on the sectoral distribution of these final demand components will be employed in a regional inter-industry (Input/Output) analysis[5] so as to provide for the following macro-economic and sectoral analysis:

1. Structural analysis of the regional economy inclusive of derivation of bottlenecks, overall capital-output and employment-output ratios.
2. Impact and Multiplier analysis related to income, capital, employment and primary factors such as land and water.
3. Forecasting and projections of the overall and sectoral demands, i.e., levels of output, value added and resource requirements.

[5]The use of national technical coefficients entails certain revisions and modifications to come up with a satisfactory regional model.

Table 4

SUMMARY OF THE SOCIO-ECONOMIC PROFILE FOR PD/CS

	Specialization of Socio-Economic Characteristics	Value	Percent
Population	Total Population 1970 (1000)	1,030	100
	Rural Population (1000)	606	58.8
	Urban Population (1000)	424	41.2
	Average Annual Growth Rate (%)		4.18
	Projected Population in 1990 (1000)	2,029.1	
	Projected Population in 2000 (1000)	2,625.5	
	Dependency Ratio (population below 14 and above 65) (1000)	493.3	47.84
Income	Per Capital Income (Pesos) (1971)	673	
	Family Income Brackets (1000 families)	156	100
	⩽ 3,000	62	39
	3,000 – 4,999	46	30
	⩾ 5,000	48	31
	Share of Income	P704,502,641	100
	⩽ 3,000	121,191,151	16.87
	3,000 – 4,999	177,810,706	24.94
	⩾ 5,000	405,500,784	56.12
Employment	Total Economically Active (1000)	315	100
	Employed	292	92.7
	Unemployed	23	7.3
	Total Experienced Workers (1000)	294	100
	Primary Sector (1000)	74	25.0
	Secondary Sector (1000)	70	24.0
	Tertiary Sector (1000)	150	51.0

b. Socio-economic analysis to derive base year and forecasted patterns of population growth and composition, labor force availability in terms of skilled and unskilled, and income and expenditures breakdown which serves as the basis for the formulation of the socio-economic targets. A socio-economic profile has been derived which is summarized in Table 4.

It is with these two facets of the regional analysis that a preliminary – due to the exclusive use of secondary data only – overall regional macro-economic model was constructed to comprise the highest level of the hierarchical analysis, which will be completed in the next phase of the current study.

The determination of the resource base, the supply level within the planning hierarchy, mainly related at this phase to land and water resources, has been undertaken in the most detailed form possible at this stage (again, resorting mainly to secondary data with complementary field surveys). Due to the lack of major portions of required information, only a preliminary assessment of the water resources balance has been made and thus refinements to derive a more accurate evaluation will have to follow after a period of field investigations for basic and complementary data.

The land resources study provided the following information:

a. The project area extends 179,300 hectares located in Bulacan, Pampanga and Bataan provinces comprising 27 municipalities.

b. About 62% of the project area are devoted to agricultural crop cultivation purposes, 25% are fishponds and the rest non-arable lands and urban-rural agglomerations.

c. Paddy rice is the major crop grown in an area of about 80,000 hectares which is distributed approximately to 37,000 hectares of single dry season crop because of prolonged flooding and about 43,000 hectares of rice cultivated in the wet season of which about 20-25 thousand hectares are irrigated in the dry season. Thus, only about 20-25% of the total rice crop area is under double crop cultivation per annum. Sugarcane comprises about 12% of the area with minor areas devoted to other diversified crops. About 9,000 hectares in the Candaba Swamp are planted to watermelons cultivated as a single crop per year.

d. While the current land use conforms reasonably to the land capability and suitability under the present natural conditions, i.e., quite efficient use is made of the available land resources, the potential of the area under improved conditions of flood control and irrigation is much higher. Thus, with proper management measures, the lands well suited for diversified crops may increase from about 22,000 hectares (actual conditions) to about 67,000 hectares after improvements. On the other hand, a reduction of the lands poorly suited for diversified crops may be realized from about 62,000 hectares to 19,000 hectares. As for rice lands, the well and moderately suited lands for rice may increase from 20,000 hectares to 100,000 hectares.

e. If full irrigation facilities will be introduced into the region, it has been estimated that 66% of the 111,000 hectares of arable land are best suited for irrigated paddy rice while only 40% are well to moderately suitable for irrigated diversified crops.

f. Prolonged flooding (50% of total cultivated area), poor drainage (24%), soil erosion (12%) and soil salinity and lack of irrigation are the major setbacks to the efficient utilization of the regional land resources potential.

The water resources studies have been devoted mainly to the preliminary derivation of an overall water resources balance for the entire Pampanga River Basin, the preliminary assessment of the groundwater potential, and the evaluation of the current water quality problems. Preliminary findings are as follows:

a. The annual mean precipitation of the Pampanga River Basin is about 1,825 mm/yr. (Angat River Basin 3,130 mm/yr. and Guagua River Basin 2,500 mm/yr.).

b. When simultaneous rainfall over the area is considered, deviations from the Basin's mean are increasing inversely with the time increment used. Thus, monthly values deviate to about 25%-97% of the

monthly mean of the wet season (Standard deviation for annual values is only 15%). Analysis of daily average precipitation realized a 1:2 years maximum to be seven times the annual average and the 1:100 years maximum to be 14 times.

c. Annual amount of evaporation is of the order of 1600-1800 mm/yr. Daily average evaporation is about 4.5 to 5.2 mm.

d. A tentative water balance for the Pampanga River Basin indicates an outflow to the sea of about 11,850 MCM/yr. out of input (rainfall) of 21,700 MCM/yr. The difference is allocated to evaporation and consumptive use.

e. Groundwater inflow for the Pampanga Basin has been estimated to range about 5,100 MCM/year of which 550 MCM/year are a replenishment to shallow aquifers suitable for potential exploitation and 3,200 MCM/year are a replenishment to shallow aquifers of which only part is suitable for potential exploitation. Total replenishment available for potential exploitation has been estimated to be about 1,900 MCM/yr. The corresponding figures for the lower Pampanga PD/CS are 1,950 MCM/yr., 200 MCM/yr., 250 MCM/yr., and 700 MCM/yr., respectively. Total inflow available for potential exploitation is estimated to be about 1,150 MCM/yr.

f. It has been recommended that about 500 MCM/yr. may be considered as safe first phase amount for groundwater utilization for the lower Pampanga.

g. Groundwater salinity in the proximity of the Pampanga Delta is a serious limiting factor in exploiting groundwater sources to meet the expanding water needs of municipalities in the area.

A very preliminary evaluation of the surface water quality has been undertaken due to the scarce available data. An intensive program for primary data collection has been established, results of which will be analyzed and employed in the second phase of the study.

Parallel to and simultaneous with this comprehensive approach, a Project Oriented Approach has been devised based on the preliminary available data in order to perform some shortcuts to the comprehensive approach so as to identify as fast as possible, some high priority projects to be implemented or submitted to feasibility analysis or detailed design. While the objective of employing this approach is to formulate a general action plan for the study area concurrent with the comprehensive study, it is imperative to preserve the overall consistency and comprehensiveness of the plan. This has been guaranteed to a certain extent by the identification and definition of the common denominator characterizing the area being a combined hydraulic system requiring overall water management to overcome the major problems of area flooding, lack of irrigation water and sea water intrusion. Thus, planning for the development of a full year cropping system may be realized as the main operative objective of development in this area to which the preliminary recommendations for high priority projects should relate.

A preliminary management and development framework for land and water resources has been derived. Preliminary recommendations on behalf of high priority projects have been inferred from this framework.

The tentative overall framework proposes three regional multi-purpose projects – flood control and irrigation reservoirs – in the Zambales slopes for the Pampanga Delta (4 tentative reservoirs), in the Lower Sierra Madre for the Candaba Swamp (4 tentative reservoirs), and in the Upper Sierra Madre for Upper Pampanga (3 tentative reservoirs).

A flood retention project of the Rio Chico – San Antonio area, an Angat floodway and irrigation system, and groundwater development projects, supplement the above-mentioned projects of the overall framework. In addition, six schemes for land rehabilitation and development have been formulated covering the entire project area and its vicinity.

Employing a criterion of selection of high priority projects consistent with this tentative development plan, which is assumed to be least sensitive to possible revisions in the future, several high priority projects have been proposed, among them:

– Groundwater exploitation of deep aquifers for irrigation in sensitive areas – Exploitation of 500 MCM/year for irrigation and other purposes. (Feasibility study)

– Integrated Flood Control and Irrigation System – Sierra Madre Reservoirs 500 MCM (San Miguel and Maasim Rivers). (Pre-feasibility and feasibility studies)

- Integrated Flood Control and Irrigation System – Zambales Reservoirs 350 MCM at Gumain and Porac. (Pre-feasibility and feasibility studies)

- Angeles-Hermosa Soil Conservation and Irrigation Project – Soil Conservation and Restructuring of Land Use Scheme. (Feasibility Study)

- Improvement of Land Utilization in Candaba Swamp Rotational System between fishponds and irrigated crops. (Pre-feasibility study)

- Comparative study for the local flood control of Candaba Municipality vs. relocation.

- Reorganization of flood control warning system in terms of its effectiveness for alerting the population of the area.

- Various improvement of dikes, roads and river channels.

- Deferment of various proposed projects for further studies.

Problems in Regional Planning

On the one hand, regional planning might provoke jurisdictional problems and, on the other hand, statistical data are actually not available for a certain choice of regional delineation. If these problems are coupled with interregional and national aspects of planning such as metropolitan expansion into rural areas, the regional allocation of public capital funds and interregional water transfers, the validity of some of the regional plans might be questioned.

Thus, certain compromises have to be employed such as formulating at the initial stage of the planning process various assumptions on behalf of the interrelationships with the adjacent units which are either an integral part of the geophysical entity or are subjected to direct or indirect effects.

Similarly, some control parameters have to be defined and quantitatively estimated in order to establish a working framework for the regional plan.

Realizing these problems actually implies an early coordination with the various levels of decision making in order to be provided with specific terms of reference and overall control parameters on the one hand, and to enhance a constructive administrative-political environment for the implementation of the plan, on the other.

The hierarchical approach as described in the preceding sections is well suited to handling these problems due to its decompositional character which requires independent explicit decisions from the various levels of decision making while being able to analyze the effect of these decisions in terms of their marginal values. In addition, the lack of certain detailed accurate data may be analyzed iteratively to establish the sensitivity of the results to the data available and the decision undertaken.

All these problems have been actually magnified with regard to the current project – the Pampanga Delta/Candaba Swamp.

The project area was delineated along municipal lines which cut through provincial borders. This was done to conform with an apparent self-contained hydraulic system. However, this resulted, as has been realized after few observations and preliminary studies, in all those problems which have been mentioned above.

To overcome these problems, the following techniques have been applied:

a. A preliminary assessment of the water balance of the whole river basin has been undertaken, realizing that there is no way to separate the Lower Pampanga Area – the Delta – from the entire basin.

   For planning purposes two options are available:

   (1) Restructuring to a certain extent the management of overall river basin water resources to come up with a more or less consistent and efficient plan of development and management for the entire system, or

   (2) Accepting, after re-evaluation of certain data, the plans outside the project area and planning for the correct residual water resources within the project area.

   This certainly will result in a less efficient plan from the overall regional (river basin) and national point of view.

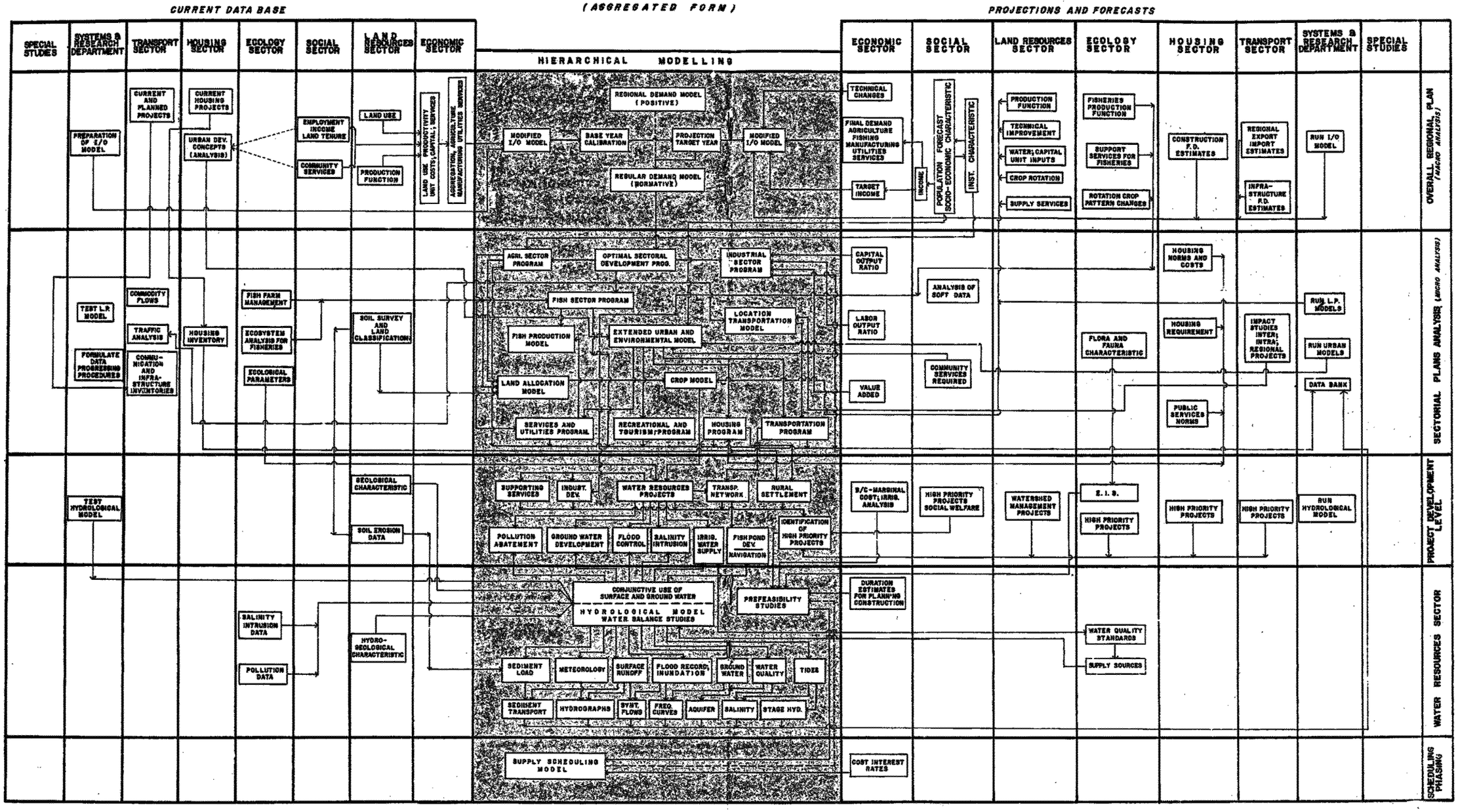
b. Wherever municipal data were available these were incorporated in the analysis. Loopholes were handled by means of

FIGURE 3.2

PAMPANGA DELTA AND CANDABA SWAMP AREA REHABILITATION AND DEVELOPMENT PROJECT

CONCEPTUAL PLANNING APPROACH AND OPERATIONAL PROGRAM OF STUDY

(AGGREGATED FORM)



approximation techniques mainly inferring from provincial, regional (Region III) and national data employing relevant weights. This resulted in rough estimates, which are the basis of the current preliminary analysis. Certain data which are thus not yet reliable enough and to which potential plans might be sensitive will have to be refined by means of a complementary socio-economic survey within the next phase.

c. A coordinating or steering committee composed of the relevant agencies has been established to overcome inter-agency conflicts.

d. An intensive effort to coordinate the various local governments even at the preliminary planning phase is underway to straighten out, at least to some extent, some of the unjustified conflicting interests and to emphasize the major expected benefits for all.

Only by following these procedures, and adhering to high professional standards, will it be possible to come up with a highly efficient and beneficial development plan which will be acceptable to the various levels of decision makers, which is the ultimate goal of the planner.

With the planning process being in its current initial stages, it would be valid to note a major rule each planner should follow:

Since verbal science has no final end
Since life is short and obstacles impend
Let central facts be picked and firmly fixed
As swans extract the milk with water mixed.

— The Panchatantra

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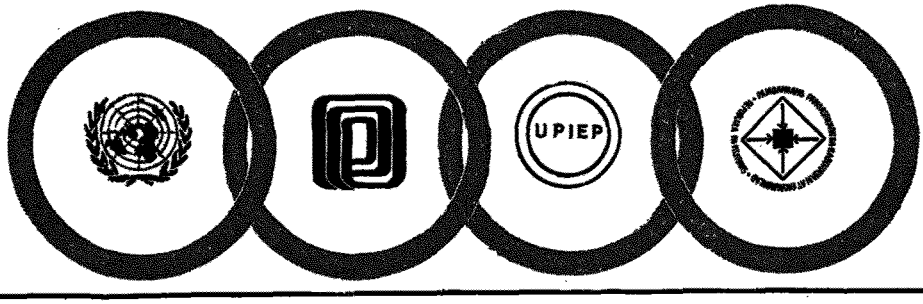
THE POLAR DEVELOPMENT CONCEPT AND THE MANILA BAY METROPOLITAN REGION STRATEGIC PLAN

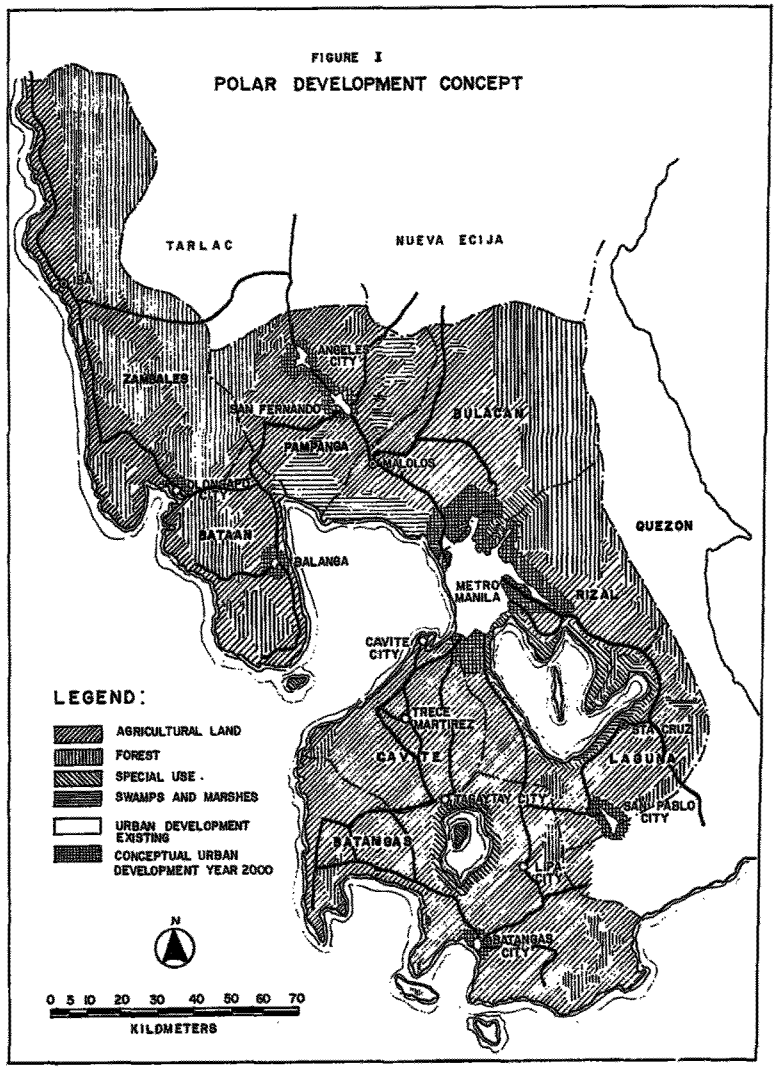
APOLO C. JUCABAN ●

The Manila Bay Metropolitan Region Strategic Plan (MBMRSP) is one of the three development planning projects under United Nations Development Programme (UNDP) assistance which were jointly undertaken by the Planning and Project Development Office of the Department of Public Works, Transportation and Communications (PPDO/DPWTC) and the Institute of Environmental Planning of the University of the Philippines (UPIEP). The other two are the Physical Planning Strategy for the Philippines from which was drawn the administrative regional delineation of the country, and the Mindanao Region Planning Strategy which became the reference point for drawing up major infrastructure and development programs for that southern Philippine Island. All three projects enjoy the support of the National Economic and Development Authority (NEDA).

A number of foreign-financed project packages have been extracted from these original development strategies. More notable recent off-shoots of these planning strategies are the Physical Perspective Plan for the Philippines, the major infrastructure projects for the Metropolitan Manila Area (MMA), and the Ten-Year Infrastructure Program of the Philippines.

The following exposition singles out the Manila Bay Metropolitan Region Strategic Plan as a case in point in an attempt to discuss the features and advantages of the growth pole or polar development concept as a pragmatic and flexible strategy for the development of a fast urbanizing region like the Metropolitan Manila Area.





The MBMRSP Polar Development Concept

The MBMRSP is basically a strategic development approach to rationally guide the growth of Metropolitan Manila within the context of regional development of the country.

The strategy which follows the polar development concept would identify and designate around five strategic poles of growth some 50 to 75 kilometers away from the Metropolitan Manila core (Figure 1). These poles are growth centers by themselves in the sense that they have great potentials for development in terms of available natural and physical resources, administrative capabilities, demographic and geographic base, and socio-political status. Since they are natural growth centers, these areas can easily assume the roles of development loci inducing spontaneous growth of, and spreading benefits within their spheres of influence (Figure 2). In short, these poles will act as the socio-economic and political centers of other minor settlement areas thereby minimizing dependency on the Metropolitan core. All major socio-economic and administrative facilities and services found in Metro Manila will be provided in these centers. Only those highly specialized services will have to be retained in the MMA.

These growth centers are strategic in the sense that they are located at a reasonable distance from MMA and they lie at the cross roads of major migration and development corridors (Figure 3). They are in effect logical

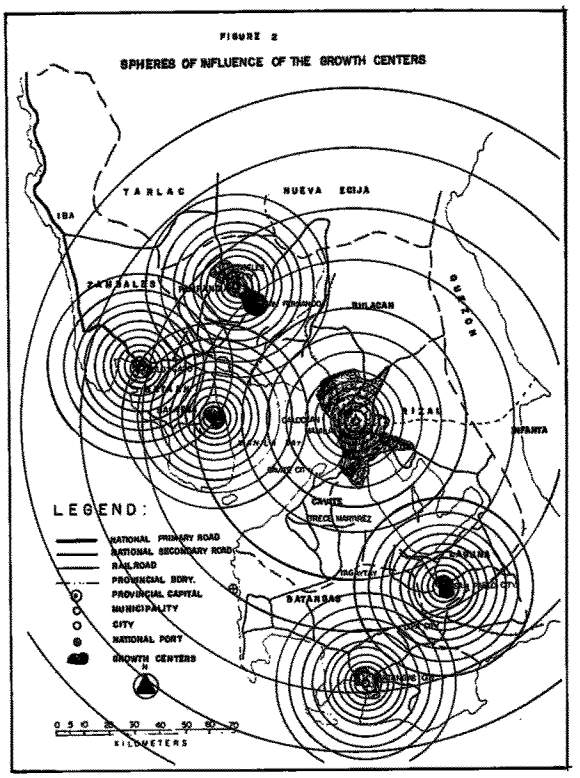
catchment areas for in-migrants from the rural areas seeking urban job opportunities and better social services. At the same time, these centers offer an alternative to investors and entrepreneurs affected by the policy of the government to disperse industrial activities away from the congested and polluted environment of Metro Manila. Prospective investors and developers need not feel being completely detached from the national financial center when they invest in these centers since their location is of reasonable distance from the MMA. Neither should they fear incurring heavy initial capital investments for these growth centers have much to offer in terms of cheap developable land, abundant raw materials and labor. And for their market, they have the centers' area of influence in addition to the Metropolitan area itself. Access to foreign and regional markets is also possible through the existing port facilities of Manila.

This strategy will also help realize the objective of the government to disperse development benefits over a wider geographical and demographic base, thereby narrowing down the gap between the higher and the lower income groups of society. Furthermore, it fulfills the NEDA regional development policies and guidelines, namely, higher standards of living, equitable distribution of wealth and income, maximum utilization of both human and natural resources, maximum feasible economic growth, and efficient, comfortable and safe environment.

Other Growth Patterns for MMA

Before the polar development strategy was adopted, other possible forms of growth for Metro Manila were considered. These are the natural growth, corridor, and cellular development patterns (Figures 4, 5 and 6).

The natural growth pattern assumes an unguided form of development dictated by the operation of the free market. The private sector, particularly the investors and the capitalists are the prime movers in initiating and influencing the direction of growth. The most logical direction, of course, is towards areas where profits are maximized at the lowest capital investments and with minimal, sometimes without, regard for public welfare and environmental quality. This results in the emergence of pockets of sporadic conversion of raw agriculturally productive lands into urban uses and or crowding into already congested

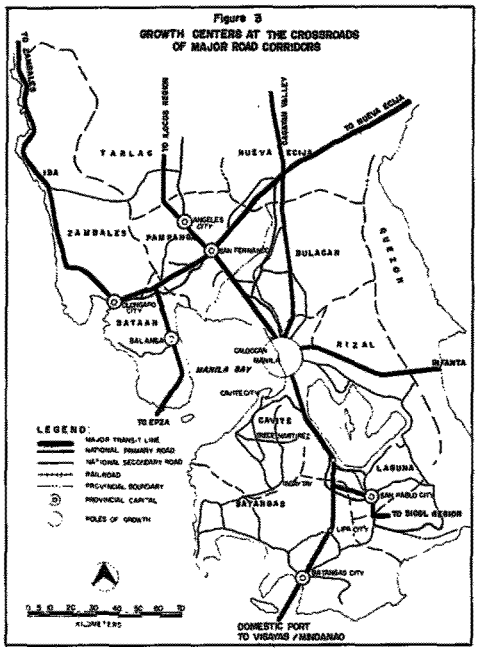


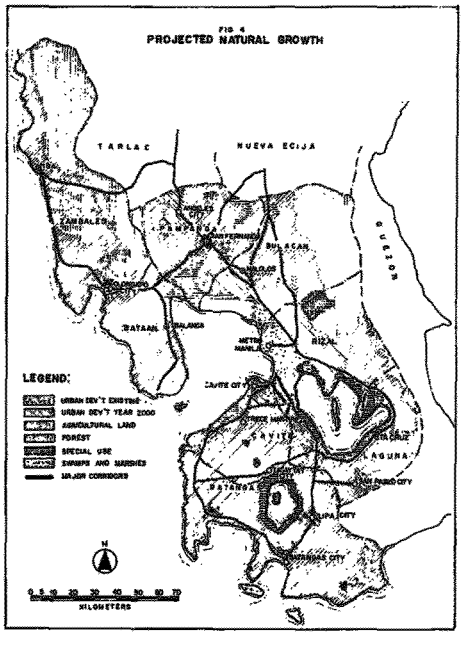
areas where the return on investment is high. In the case of the former, undesirable urban sprawl extends, as it were, its tentacles outward into valuable agricultural lands and much-needed open spaces. In the latter case, development occurs in every available space within the already congested metropolitan core resulting in the deterioration of essential services and facilities. In both cases, it is the responsibility of the government to provide basic facilities and infrastructure support to maintain social services at desirable levels. Thus the urban and metropolitan areas gobble up investments, pre-empting development that would otherwise be directed towards the lagging and depressed regions of the country.

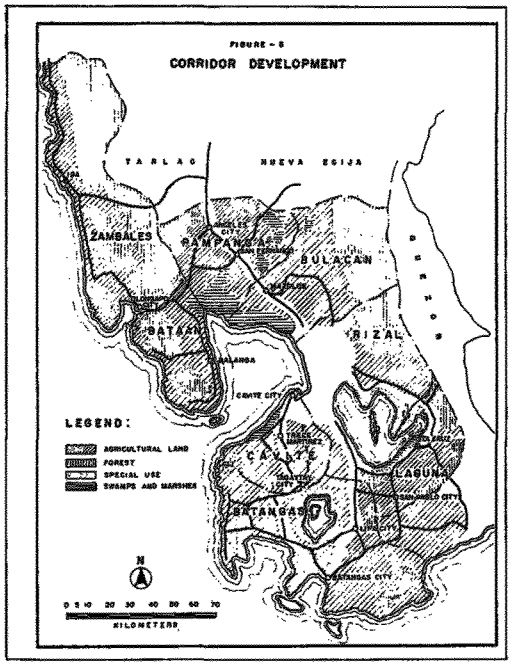
The corridor development pattern is a slight modification of the natural growth pattern with a minor degree of government participation. The free market mechanism still plays an active role in directing development thrusts. In this pattern, urban growth follows major transport and infrastructure corridors (Figure 5). The corridors may extend to a long continuous band from the core to other nodes or centers of growth while the areas between the corridors are preserved or maintained in their existing productive uses. The difficulty here is that of providing the basic life-support facilities like water, communication, power, and circulation as well as social and community facilities. The longer the corridor the heavier the investment required due to engineering and technical considerations.

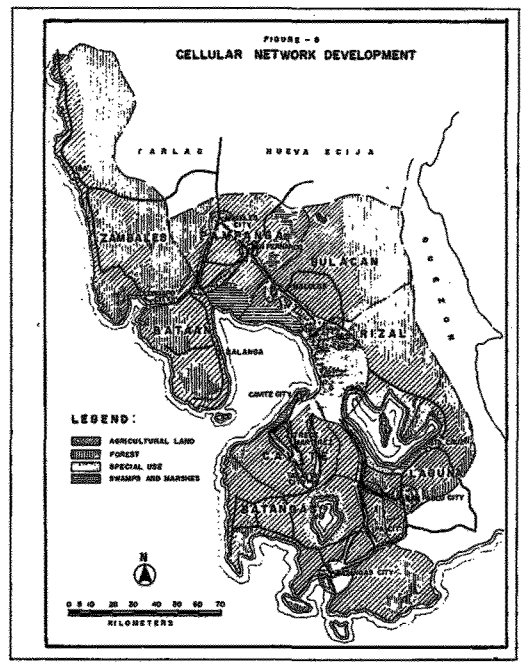
Also, administration is a great problem in the sense that the main operation is dependent on, and controlled by the general administrative machinery in the central core. The corridors are dependent on the central core for higher and specialized form of socio-economic services. Unless there are good transport linkages between corridors, physical communications will have to pass through the central core. In essence, the central metro-core acts as switching station for all sorts of activities. Although inter-urban transport linkages could be established, the question is, is it worth investing in considering the fact that the volume of transactions between these centers is not as great as those between corridor centers and the main center (MMA)? Others may argue, however, that these road networks connecting centers of the development corridors will trigger off much development so that in the long run such public investments become feasible and viable. But then this will lead to the same growth pattern where the private capitalists invest in areas of high financial returns. Irrational and haphazard development then is again the ultimate result. And even granting the argument that such intricate road networks are beneficial and technically viable, what about the other life-support requirements like water, flood control, and sewerage?

The third possible alternative form of development is the cellular pattern which is a greatly modified and controlled version of the corridor









development pattern. Instead of allowing urban development to extend indefinitely along a major corridor, development under the cellular form takes the form of cloud loops or cell-like structures (Figure 6). The problem here is that the development cell most probably includes areas with very little potentials for urban growth and with minimal existing infrastructure and facilities which would necessitate prohibitive public investment but yield very little economic benefits. This form of development would have the same difficulties as the corridor pattern with higher degree of rigidity, a higher degree of control, and more government intervention in terms of subsidy and public investments. Implementability of this scheme of development is extremely doubtful.

Advantages of the Polar Growth Concept

The recommended development strategy, the polar growth concept, is the most desirable, pragmatic and feasible in terms of public investment requirements particularly in supportive infrastructures (water, transport, power and social services), environmental impact, availability of natural and physical resources (developable land, raw materials, existing infrastructure and social welfare facilities, population/labor force, etc.), administrative capabilities (revenues, existing political and administrative functions), and social implication (social susceptibility to urban change, impact on income distribution, employment opportunities, etc.).

Under this strategy, each designated primary growth center is an autonomous urban center complete with the basic infrastructure and social service facilities comparable with those found in Metro Manila. Dependence on the primate city (MMA) is nil, except for some highly specialized services.

Public investment is also reduced to the minimum thereby allowing substantial government funds to be channelled to other depressed and lagging areas of the country. Furthermore, benefits are maximized and spread over a wider population sector and broader geographical area. This is highly possible because of the existing urban infrastructure and community facilities within the designated growth centers together with the available financial and business services. Cheap raw developable lands which are of marginal agricultural utility together with the natural resources are more than adequate to support socio-economic activities similar to those in the Metro-Manila Area.

Misconceptions about the Polar Development Strategy

Although many are agreed on the advantages of the polar concept of development over the other three forms, several issues concomitant thereto are still misunderstood. One such basic misconception is that the polar development strategy for the Manila Bay region is equated with the traditional rigid "Master Regional Comprehensive Plan" which usually takes one

to three years of formulation before a single project is identified and implemented. The Manila Bay Region planning strategy is not such a master comprehensive plan. It is a set of strategic guidelines indicating rational and pragmatic directions of growth which could immediately answer the needs of the general public. In this strategic scheme, projects are immediately identified which are obviously necessary to resolve some of the major and crucial problems in the Metro Manila area in particular and the Bay Region in general, without waiting for the total completion of the strategic plan. Thus, as early as the first six months of the formulation of the Manila Bay strategic plan, vital social-physical infrastructure projects and programs are identified – Tondo Foreshore housing program, Mangahan diversion channel for flood control, several major urban transport road programs, and ports and airports improvement, to name a few.

This is the reason why the MBMRSP is more of a strategic policy guideline rather than a master physical plan. It is flexible, dynamic and responsive to the demands of the people.

Another misconception is that the MBMRSP planning area is construed to have a definite geographical boundary similar to municipal/town territorial boundaries. The planning area delineation is purely conceptual and functional and never a territorial one. After the strategies have been accepted and officially adopted, the planning boundary is withdrawn and each municipal/city administration is allowed to operate on its own but guided now by such strategic policies. This is actually a systems approach where the MBMR is a total system composed of mutually reacting but independent sub-systems (cities/municipalities). With this approach there is less disturbance on the existing operations, hence less opposition to the recommended strategies. This is how dynamic and flexible the polar concept is as applied in MMA and the Bay Region. The polar centers with their satellite communities act independently of MMA, yet all are functioning with efficient harmony and complementarily. Each center is never meant to compete with MMA, but rather healthily counteract the destructive effects of one upon another in order to achieve orderly concentration and flow of activities. This is actually similar to electric poles and flow of electric current from one to the other.

The third misconception is that the MBMRSP is in conflict and inconsistent with the regional plans of the administrative regions of the country. This is because many are misled by the fact that the MBMR encompasses parts of two administrative regions – Regions III and IV – and therefore they look at the MBMR as a distinct region by itself and that the polar strategic development is a regional plan *per se*. This is far from the truth because the centers, and other major development areas of the MBMR are considered within the context of their possible roles in their respective administrative regions rather than as parts of a distinct region as the MBMR. The MBMR boundary is just a planning boundary and never an administrative one. Actually the growth centers will function as major components of their respective administrative regions. The guidelines laid down actually enhance regional development in as much as inter-urban and inter-regional interactions are harmonized.

There are other misconceptions which are just a matter of semantics and/or professional biases which need not be clarified. Suffice it to state that the polar concept as applied to MBMR is more of a strategic approach to resolve problems in the MMA and at the same time promote regional development utilizing existing available resources and current socio-political circumstances. The strategy is never rigid but is adjustable in response to changing times and conditions.

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The Bicol River Basin Development Program:

An Exercise in Integrated River Basin Planning

● *Emanuel I. Astillero*

INTRODUCTION

A pioneering exercise in River Basin Planning is going on in the Bicol River Basin (BRB). Now on its 3rd year, the BRB Development Program, conceived as the first Philippine Government Project in integrated rural development, has concretely planned and actually funded, with bilateral assistance from the U.S., two key investment projects valued at P183 million.

The first project, six years in duration, provides irrigation, drainage, flood control, salinity control, roads, land reform, compact farm development, irrigator's association and agricultural development in a 4,000-hectare wet rice land, directly benefiting 2,400 farm households, and indirectly the 12,000 families of Libmanan and Cabusao in Camarines Sur.

The second project (1977-1982) will construct 454 kms. of secondary and feeder roads, 1,017 l.m. of concrete bridges in 14 towns of Camarines Sur and Albay, providing social and economic benefits to 171,000 people along the roads' "influence area".

The most significant result of Bicol River Basin Planning is the heightened coordination among 14 key line agencies operating in the basin as well as the provincial and municipal officials included in the planning area. The marked degree of "working together" has funneled into the area major government capital investments slowly lifting Bicol up from the third ranking depressed regional classification (the other two are Cagayan, 2nd; and Samar-Leyte, 1st) as a "downward transitional area" (UN1967).

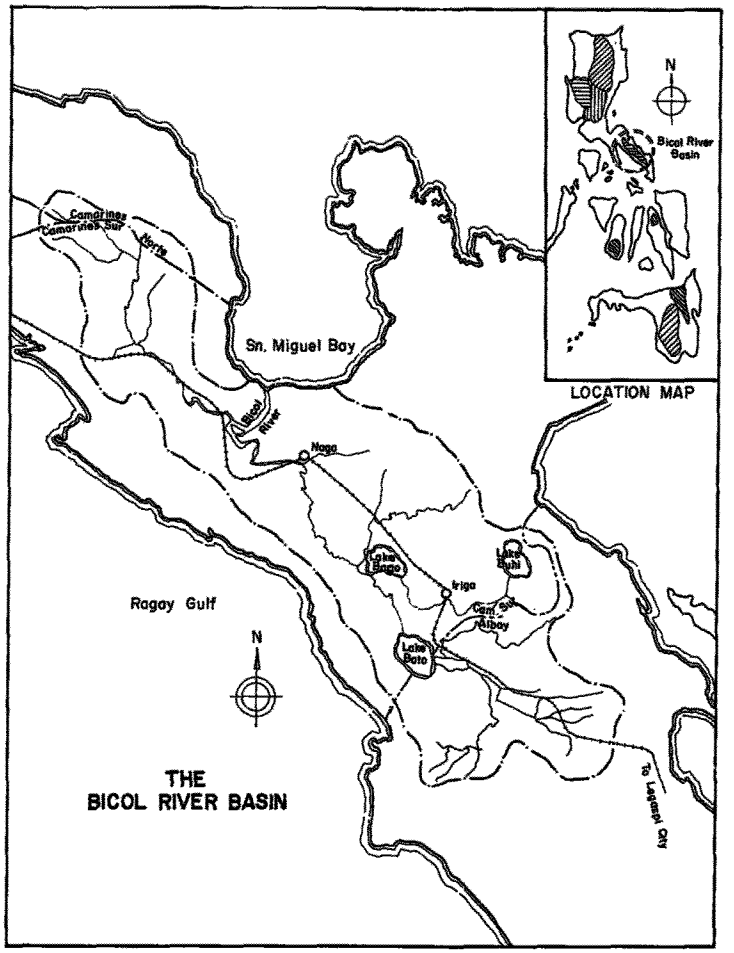
The conceptual framework of BRBDP calls for interlinked multi-sectoral efforts proceeding along a coordinated sytem. This is directed towards the concentrated delivery of government investments into well defined "critical" areas. While the ultimate objective is economic (raising per capita income), the foundation is social (manpower and institutional development thru education and training, health and nutrition), and the means are both physical (roads, irrigation, drainage and flood control) and agricultural (crop production, post-production technology, agri-business and agro-industries).[1]

A. THE PLANNING AREA

1.0 Physical

The Bicol River Basin, a 312,000 hectare fertile valley located in the Bicol Region, stretches across Camarines Sur, Camarines Norte and Albay. It is one of seven river basins identified by the National Economic and Development Authority (NEDA) as areas of high growth potential where incremental inputs in development would result in maximum benefits both in social and economic terms.

[1] "Conceptual framework of BRBC," Emmanuel I. Astillero, PPDO-DPWTC, 1976 (Mimeo Manuscript) paper presented at BRBC-ADT Workshop, Naga City.



The basin, 450 kms. by road and one hour by air from Manila, extends 135 kms. in a NW-SE direction, approximately 35 kilometers in width, and is defined in the west by a chain of four volcanoes starting from Mayon (2,421 M) in Albay to Mt. Isarog (1,320 M) in Camarines Sur. The Bicol River meanders from Lake Bato in the upper basin (Albay) for 130 kilometers emptying at a tidal estuary in San Miguel Bay. In the northwest, the highlands of the Bicol National Park (Camarines Norte) drain into the Sipocot-Libmanan River, joining Bicol River at the estuary. In the southeast, the low ranges of Ragay hills form the valley.

The Basin topography has given the area rich volcanic soil and abundant underground aquifers specially suited to rice culture. Almost two-thirds of the basin is watershed; the rest is arable and 20% is flat land on the flood plain.

2.0 Demographic

Based from the 1970 census, the basin area which is 20% of the Bicol region contains 1.015 million people or roughly a third of the regional population. It has a density of 205.7 persons/sq.km. which is 1.39 times more than that outside the basin, and 68% more than the national population density.

The basin is rural; 81.94% of the population live in rural areas. The rural composition of the basin is higher than the Region's 80% and the nation's 68.7%. The labor force is 35% of the population with an unemployment rate of 7.2% compared to the national rate of 4.2%. The underemployment is, however, a high 20.6% indicating an effective unemployment of 8.64% or double the national experience. The dependency ratio is one employed person supports 7.38 other

persons. The basin population will almost double within 25 years, reaching 1.952 M by 2000. A regional outmigration rate of 0.9 (1960-1970) indicates a trend of depopulation due to poor economic opportunities.

3.0 Economic

The basin is basically an agricultural economy with 69% of the labor force employed in the primary sector and 32% of the arable area planted to rice (the predominant crop), coconut (41%), abaca (3%), vegetables (3%) and feedgrains (9%).

The median annual family income is a low P1,874 in 1971 which is one-third of the Metro Manila level, and the poorest 40% of households constitute 51.3% of the population. This low income increased to P2,172 in 1974 or an annual improvement of 5%, a rate easily negated by inflation ranging from 15-25%.

The average farm size is 1.3 hectares producing an average yield of 32 cavans/crop/hectare against a potential of 100 cavans and the national experience of 41 cavans/hectare.

As a result, poverty is acute. In 1974 the average annual per capita income was P562.50; but for rural residents, it was P412.50 against the national average of P775, at constant prices.

Due to inadequate infrastructure there is very little public and private investment resulting in a value added of only 5.3% in 1967, as against 5.5% national. This was projected to dip down to 4.1% by 1975, if left unchecked.

B. THE POTENTIAL

The fertile volcanic soil, abundant water, and a large farming community, form the greatest potential of the Bicol River Basin in the production of food cereals, vegetables, meat, fish and commercial crops. In 1970 for instance the basin area accounted for approximately 54% of regional production in rice.

The Bicol River Basin, by 1990-2000 can produce rice for its own consumption as well as for an additional 6.1 M people outside the basin, given the right social and physical infrastructure supports.

The potential for vegetable production is 56,892 metric tons (in excess by 17,755 metric tons); for root crops, bulbs and tubers, 944,795 in excess and 94,697 metric tons in fresh fruits over and above the basin requirements. These potential excess production can feed from as many as 1.3 M additional people with vegetables to a staggering 30.0 M people with root crops.[2]

There is a clear potential for extra-regional "export". Current yield (1975) for palay, for instance is only 24% of the potential (16 MT/ha.). By 1990, the agronomic yield should at least approximate 75% of the potential.

C. THE RESOURCES AND CONSTRAINTS

To realize these potentials, an estimated capital investment requirement of P4.2 billion;[3] both public and private, is needed. The public participation is 25%; 75% for the private sector.

These investments must develop land, water and human resources to attain optimum agricultural production levels.

1.0 Land Resources

Physical infrastructure forms the base of capital investment in flood control, drainage, roads, ports, and terminals.

Annually, floodwaters from surface run-off, principally from Mayon Volcano, inundate 42,000 hectares of prime rice land in the flood plain. Basin planners aim to control this to 0%in normal floods and 60% in 10-13 year floods.

The present road kilometerage is 1,300 kms. providing a poor density of 0.33 km./sq.km. within the basin. The national experience is double this, or 0.6 km./sq.km., and the standard for minimum development is 1.0 km./sq. km. land. The basin will need an additional 3,120 kms. of secondary and feeder roads.

[2] Crop Production, a Sectoral paper on Agriculture by Ramon Santiago, BRBC-PPDO, March 1976.

[3] At 1967 prices.

The only seaport lies in Legaspi City, 105 kms. from Naga City which is the center of the basin. The nearest available port is in Pasacao, which has limited capacity, being without protective cove and abrupt depths. The only airport is in Pili which has attained its maximum runway length, unsuited to jet traffic, because of topography and proximity to Mt. Isarog.

2.0 Water Resources

While the basin abounds in surface and underground water, further development is needed for irrigation, potable water and water for industrial and commercial uses.

Of the 100,000 hectares irrigable area, only 30,000 has. are irrigated year-round and an additional 20,000 has. are irrigated when the rains come, leaving 50,000 has. still to be irrigated.

Only 26% of basin residents have piped water. The rest depend on shallow wells, springs, rivers and lakes, contributing to a high incidence of water-borne diseases. For instance, from 1970-1974, the Department of Health found that 47.5% of water samples are positive for bacteria, and 34.5% for E. Coli organism (micro-organisms from animal/human feces).[4] A BRBC project in medicinal herbs found 92% of public school children positive for intestinal parasite such as ascaris, hookworms and trichuria.[5] The Department of Health, Region V pinpoints gastro-enteritis, a common disease resulting from contaminated water supply, as sixth among 10 leading causes of mortality and second of morbidity.

Tidal fluctuations of San Miguel Bay, at the Bicol River estuary, carries saline water 45 kms. upstream of the Bicol River and 25 kms. of the Sipocot River.

Approximately 10,000 hectares of prime ricelands in low-lying flood plains adjacent to the estuary are affected by salinity, effectively lowering yields if not preventing cultivation altogether.

[4] Bacteriological analysis of water, Regional Health Laboratory, Region V, Legaspi City.

[5] BRBC Medicinal Herbs, Interim Report, January, 1976.

3.0 Human Resources

The basin's 1.0 million people are largely rural and are engaged in agriculture. For the basin residents to respond to development inputs and achieve the objective of improved income thru optimum agricultural production, it will require social development, mainly in education (formal and non-formal), institutional formation (compact farms), health and nutrition.

3.1 Education and Training

While literacy is high at 86.82% region-wide, out-migration is also high, indicating a disorientation in manpower training. It is not attuned to the immediate environment.

For instance, the drop-out rate in education is a high 92% from elementary to college, or a survival rate of eight percent at collegiate graduation. While the environment is rural and agricultural, in Camarines Sur, for example, 57% of 17,815 professionals in 1970 are teachers, followed by commerce graduates (15.1%). Agriculturists constitute only 1.4%. Relevant manpower training is clearly required.

3.2 Tenancy

Tenancy, to which the current land reform is addressed, is high. The elimination of tenancy is necessary to afford farmers a larger share in farm income. Under tenancy, about 85% of farm income goes to landowners. Of the 66,943 farms in the basin, 46.7% are tenanted. By 1975, 21.6% of 39,397 rice and corn tenants have been granted certificates of land transfer. The Department of Agrarian Reform, Region V, expects to accelerate its program to complete the transfer before 1980.

3.3 Health

The state of health of basin residents is indicated by availability of safe water, sanitation practices and health services, both preventive and curative. In Camarines Sur, where two-thirds of the basin is located, only 31.8% of urban and 4.5% of

rural households have piped water. The most common source of water supply is the shallow artesian well (72.5%). Water sealed toilets are used by only 23.5%.

For the 1.0 million basin population, there are 1,604 hospital beds, a physician for every 8,000 residents, 40 rural health units for the more than 1,080 barrios. Most of these facilities are town-based.

As a result of the poor health service delivery systems and the inadequate potable water supply and sanitary facilities, infant mortality rate is 62.85 per 1,000 live births (Bicol Region is 61.39), 92% of public school children are positive for intestinal parasites; 30% of morbidity is attributed to enteric or water-borne diseases; typhoid still becomes epidemic (as in Naga City, 1975); and the four leading sicknesses are gastro-enteritis, pneumonia, influenza and tuberculosis — all of them preventable diseases if health services and facilities were adequate.

3.4 Nutrition

Concomitant with improved agricultural production should be an improvement in the quantity and quality of food intake — from cereal-based foods to more protein and vitamin contents. The nutritional dimension of the basin's human resources development is interlinked with health considering that the four leading causes of morbidity could be averted if the people have stronger physical constitution.

The groups vulnerable to malnutrition are infants, pre-school and school children, pregnant and lactating mothers.

Nutritional inadequacy in the basin is indicated by an infant mortality rate (IMR) of 61.39 per 1,000 live births ranging from 42.75 in Albay, 62.85 in Camarines Sur and 81.41 in Masbate. The maternal mortality rate (MMR) region-wide is 2.4 (Camarines Sur — 1.9). The national experience is IMR 78 (1975) and MMR 1.4 (1972). A combination of primary and secondary malnutrition is estimated to contribute to over 50% of infant deaths. *Operation Timbang* in Bicol indicated that 95% of school children are malnourished; in the 0-5 years age group, about five percent third-degree malnutrition prevails (1975).

4.0 Forward Linkages

The achievement of optimum food production hinges on agricultural development. This will require forward linkages into agri-business, agro-industries and urban development.

4.1 Agri-business and Agro-industry

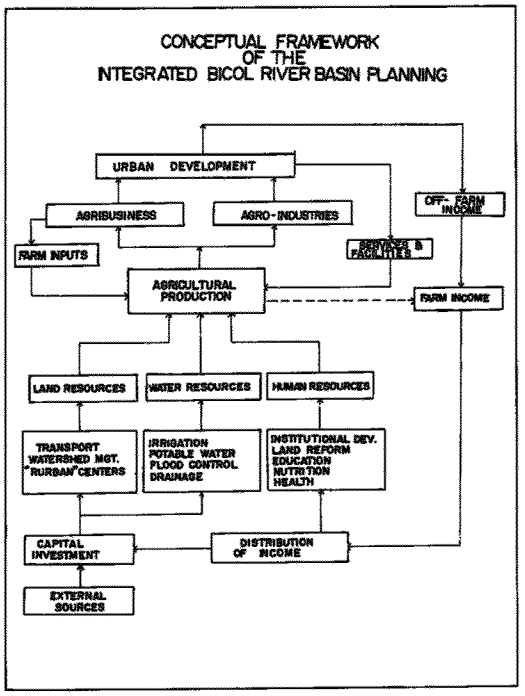
A critical sector in River Basin Planning is agri-business. First, it provides farm inputs to agriculture (credit, fertilizers, seeds, pesticides, equipment, etc.) and second, it provides a market for farm produce. It is obvious that activities generated by agri-business will influence the pace and depth of agricultural development; e.g., higher priced farm inputs will make agricultural production expensive and lower prices for farm produce will discourage agricultural production.

The Agri-business Development Program, therefore, seeks to rationalize these conflicting forces acting almost simultaneously on the farm, so that costs of farm inputs and income from the sale of farm products can be stabilized. Agro-industry on the other hand, will look into potential by-products of farm produce in order to absorb excess production, convert these into processed products, thereby creating off-farm employment.

4.2 Urban Development

The basic strategy for urban development requires the dispersal of urban services and facilities into the hinterlands. This is in recognition of the basin's rural and agricultural orientation, a characteristic expected to persist in the next 50 years. Instead of following the traditional urban planning which is city and town oriented, urban development shall be rural-oriented, i.e., it will be supportive of agricultural development occurring in rural areas, not urban centers "living off" the rural areas.

This necessitates a willful government intervention into the direction and intensity of urban growth. The BRB Urban Plan foresees the establishment of "urban" satellites, fairly distributed in the hinterlands and connected to a higher order of urban center hierarchy.



D. BICOL RIVER BASIN PLANNING OPERATIONS

Executive Order 412 signed by the President on May 17, 1973 which created the Bicol River Basin Council in Camarines Sur integrates and coordinates sectoral programs and projects of line agencies operating in the basin. As a coordinating agency, it organizes multi-agency project groups to study projects or implement programs. As a planning office, it initiates a basinwide comprehensive plan, prepares sectoral programs and conducts feasibility studies of key investment projects. Applied researches and pilot projects of BRBC unravel basin potentials and reinforce planning knowledge about the Bicol River Basin.

One of the more important mandates of the BRBC Planning Office is the introduction of "integrated area development" as a planning approach to basin development. As BRBC interprets it, IAD is dictated by realities of scarce resources; it avoids wasteful spread of government investment funds over a wide area in unrelated projects. The IAD approach considers all sectors as interconnected, interdependent and interlinked, each one mutually reinforcing the other.

Since 1974, BRBC has received P18.5 M funding from NEDA and 10 other participating agencies. This was used by its 105-man staff, 40% of whom are professionals composing the planning staff, to develop specialized sectoral plans, a basinwide framework plan, and feasibility studies. In addition to the core staff, the BRBC hired 159 men, beefed up by 204 others on detail from participating line agencies.

The major projects of the Bicol River Basin include: (1) Water Resources and Land Development (water supply, water balance, hydrometeorology, topographic mapping and land classification, comprehensive water resource study, on-farm water management, land consolidation, Libmanan-Cabusao IAD, Barangay water filtration system); (2) Agricultural and Human Resources Development (farm mechanization, aquaculture, upgrading of the Camarines Sur Agricultural College, Area Development Council, crop, livestock and fish production, studies on medicinal herbs, compact farm training); and (3) Transport (Internal Transport Study – Regionwide).

Seminars and workshops are used by BRBC to develop an attitude of coordinated work among agencies operating in the area, including the private sector, and most especially, the local governments. In 1975, over 100 government and private agency personnel and farmers were in more than 50 BRBC-sponsored workshops; in turn, BRBC staff attended over 30 conferences in Bicol sponsored by other agencies. BRBC assists the NEDA Region V in its planning activities.

CONCLUSION

Development is viewed as a "system" consisting of a series of coordinated activities to effectively spur growth in pre-selected "critical areas" of high growth potential. The purposeful integration of sectoral activities in a specific geographical area produces a considerable impact, resulting in optimum benefits and ushering in social change.

The Bicol experiment is an application of this concept in development planning. If the experiment succeeds, and to all indications it will, it will mean an improvement in the quality of life of the Bicolano. To the planners, the lessons learned from the experiment will serve as valuable inputs into the planning of other river basin areas of the country.

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PROJECT MANAGEMENT INFORMATION SYSTEM:

The DPWTC Experience

● *RENE S. SANTIAGO*

Three issues have surfaced now and then in the discussions of planning practitioners in the Philippines: the need for a planning process, for linking planning with implementation, and for creating a management information system. This paper is an attempt to grapple with these three issues on the premise that all are in fact interrelated. A particular case — the DPWTC experience — is highlighted as a concrete example of how these issues were and are being met.

The Planning Process: a Visualization

Let us discuss the first issue. How does a planning process look like? What exactly is it?

While no precise definition can be presented, it is enough to cite a few necessary, though not sufficient, properties. Adaptiveness is one. It is inherent in the process itself. The elements in the process which are always in a state of flux, function organically, adapting in their own way to a constantly changing environment. Somehow the cumulative effects of the responses lead to the accomplishment of purpose. From this structural viewpoint, the traditional master plan approach is thrown in an unfavorable light. It partakes of rigidity — synonymous to a static

picture of a future situation which was drawn at the start of a study and which is supposed to happen over say a 10-year period. It connotes a temporal dichotomy whereby planning stops where implementation begins. No matter how conceptually appealing it may see, this is not true for situations where a process exists. Thence, the boundary between planning and implementation is blurred.

Another important element of a planning process is continuity. Automatic generation of alternatives occurs as a matter of course. In the daily grind of activities, a coherent and consistent set of actions happen sequentially.

It is helpful to visualize the planning process then as a circular loop (see Figure 1) where implementation proceeds from planning and programming, and feeds back to the next cycle of planning activities by means of new information generated. One can immediately deduce from Figure 1 that planning feeds into implementation if the "process" works. This is possible provided there are organizational units which perform the cycle of activities indicated in the boxes, and which receive the appropriate stimulus to function together.

The Task

Planning as a distinct activity has become the concern of interdisciplinary efforts. This, of course, means a concentration of brain power which in turn can be interpreted as nothing more than the mobilization of organized knowledge around the problems of man. This latter phenomenon was triggered by information explosion brought about by developments in information theory and cybernetics. Naturally, this had its ripple effects in urban and regional planning. Planning organizations have become information processors or information factories — ever hungry for data and continuously producing information, and sometimes "pollutants."

From this perspective, the task is clear: to prime the information processor with its so-called raw materials — information. And project execution is a prime source of raw materials by means of feedback. Error-actuated feedbacks are the key to control in the planning process. And since the feedback mechanism will encompass all projects (whether initially the result of a comprehensive and elegant planning efforts or not), then one expects a modulation of deviations of implementation from a plan through time. At the start, it is understandable to see so many investment projects being done by government not conforming to a comprehensive plan. This is because planning is not yet pervasive, and it will become pervasive if and when it gets attuned to the realities of implementation. For then, the inputs to the project execution cycle will be the outputs of a planning cycle.

Information System

The invisible fabric that runs through the first two issues is the management information system or MIS. Information is indispensable in coordinating and harmonizing the activities of separate organizational units toward a given objective, project implementation.

In more definite terms, an MIS can be regarded as a network which links the various functional units of the organization through the regulation and regularization of information flow between and among these units, at the lowest possible cost, all the data — and only those data which he needs to make decisions — at the time he needs them, and in a form which aids his understanding and stimulates his action. And when the word "project" is tacked in, the object becomes unequivocal.

Objectives of the DPWTC PMIS

A project management information system (PMIS) for the Department of Public Works, Transportation and Communications (DPWTC) was conceived as early as 1973 to:

1. Keep planners, policy and decision-makers at the national and regional levels well-informed of the actual conditions affecting field operations;

2. Show the time and cost status of all projects against targets/budgets within a reasonable time lag;

3. Pinpoint problem areas and bottlenecks and bring these to the attention of the appropriate decision-makers for immediate action; and

4. Support the next cycle of planning and project development efforts not only by making useful items of feedback information available to those who have been involved in the earlier planning stage, but also by providing the quantitative base for the advanced consideration of the consequences and implications of a plan or project.

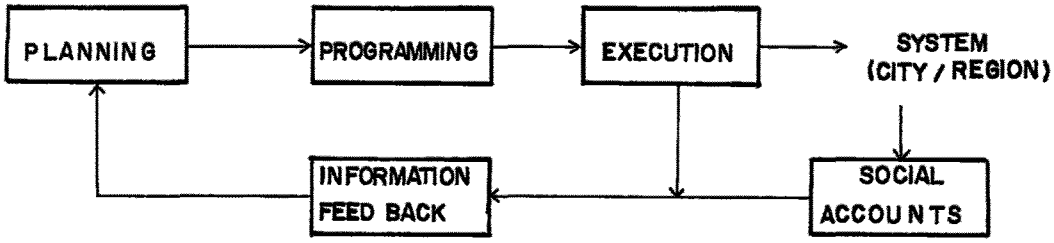

FIG. 1 - SCHEMATIC DIAGRAM OF THE PLANNING PROCESS

Systems Design

In developing the PMIS, the project team investigated the existing information generation of the different levels of the DPWTC organization, studied the needs of management and planners, and analyzed other similar endeavors. The latter step was instructive in deducing what made a system tick and another one fail. A fundamental deficiency in almost all existing systems explored was the unidirectional flow of data. A framework of decision-making was missing.

Certain unique features were incorporated in the overall design schematically shown on Figure 2. These are:

1. The use of PERT/CPM as the basic tool for work and cost programming — scheduling, setting targets, cash flow — and the basis for monitoring progress;

2. The imposition of interconnected and reinforcing hierarchical information cycles: in the regional, bureau, and central levels. Each loop, for example the regional level, can operate on its own and serve as the information system for regional decision-making;

3. The simplification of report forms to lessen the burden on the lower level — who are expected to concentrate their time on actual operations;

4. System reliability as a result of: (a) dual mode of reporting — by mail and telegraph; (b) dual source of information for the same data vis-a-vis a project; and (c) dual backup files for the central file, thus making it possible to reconstruct lost or misplaced records.

To the people in the organization, it looks very easy and simple since the "system" translates itself into six (6) report types:

1. Initial Project Plan Report — Form 01 — is prepared only once before the project gets started and contains essential information about the project including funding and time schedules.

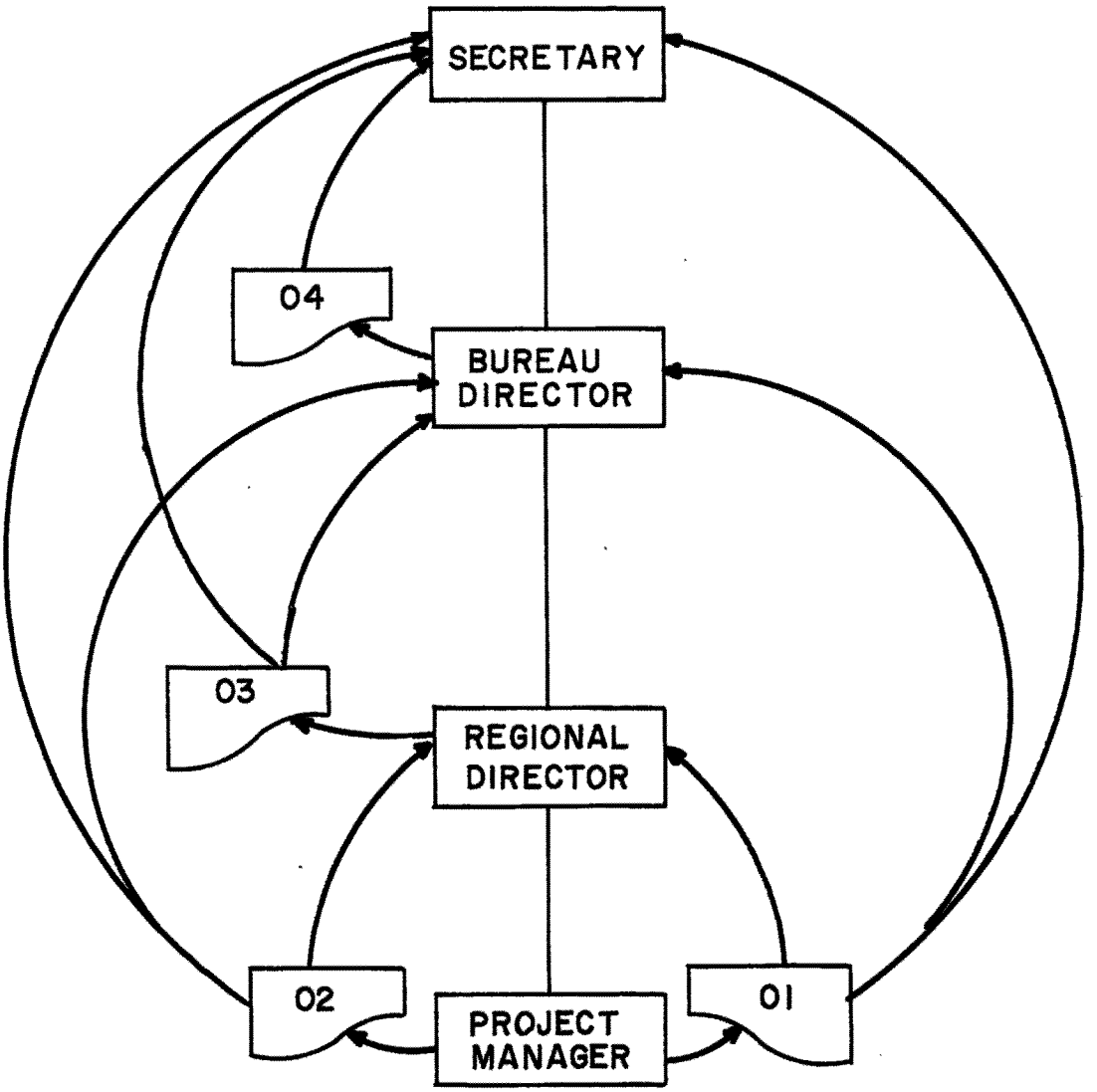

FIG. 2 - THE DPWTC PROJECT MANAGEMENT INFORMATION SYSTEM

2. Monthly Project Status Report – Form 02 – is an end-of-the-month report on what has been done during the period.

3. Monthly Regional Project Summary – Form 03 – summarizes status of all projects under implementation in the region for the information needs of the Regional Director.

4. Quarterly Consolidated Projects Summary – Form 04 – prepared at the Bureau level, is an analysis of the program implementation regionally and nation-wide.

5. Project Completion Report – Form 05 – is a signal device to end the monitoring and close the accounts of the project; it also indicates advisability of initiating post-investment or impact study.

6. Exception Report – Form 06 – is prepared and submitted to the appropriate decision-making level if and when an out-of-control situation arises or is anticipated.

Systems Installation

The government bureaucracy is well-known for its resistance to change. An all-out effort reminiscent of new-product-market-introduction campaign was launched to erase the old habits of reporting. Top management support was secured for the system as early as June 1975 with the DPWTC Secretary himself, presiding in an executive session. Regional workshops then followed for 12 regions over a period of two months (from December to January). Training for staff at the central/bureau level was also conducted. Should the results still fall short of targets, supplementary seminars will be held for problem areas on a trouble-shooting mopping up basis from March to June 1976.

A department order installing the system and defining the responsibilities of each organizational unit was issued in February 1976 – to legalize the PMIS. A big psychological boost was given also by President Marcos in early December 1975 when he announced a mandatory requirement for all government agencies to install their appropriate MIS.

Directions of Future Work

Hopes are very high that the DPWTC PMIS will succeed. In fact, it has already changed the ground rules for infrastructure projects management in the government. But the task cannot be considered complete. The Project Management Information System is a growing thing. Computer processing, establishment of a central projects data bank, are now in the drawing boards. Time was when the lag of two to three months was standard. Now that time lag is getting shorter. Even the fifteen days lag for the present PMIS is still not good enough. Already, plans are being drawn for instant telecommunication hook-up between and among regional offices.

With the time-consuming computational and processing tasks handled by computers, the PMIS is expected to sharpen and enhance analytical capabilities and thus expand its sophistication to more important management and planning problems. The PMIS is intended to fill a critical void in the planning process, and since it is expandable to include the project scoping and preparation phases, the PMIS has the potential of being as it were, the respiratory system of a living and dynamic planning process.

If one takes into account the fact that infrastructure projects are dominant instruments for affecting the spatial and settlement patterns of the Philippines, then one can appreciate the role of PMIS in the DPWTC.

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National Conference on Human Settlements Held

The National Conference on Human Settlements was held at the Philippine Village Hotel on March 7-12, 1976. The week-long conference was organized by the Task Force on Human Settlements for the primary purpose of drawing up a National Action Program to be articulated by the Philippines at the 1976 HABITAT: UN Conference on Human Settlements to be held in Vancouver, Canada, in June this year.

The conference which revolved around the theme: "Human Settlements – Fulfilling the Vision of the New Society", also sought to achieve the following objectives:

- To underline the New Society's commitment to human well-being through the uplift of the quality of life and environment of human settlements, the situs where life is spent, where it should have meaning;
- To acquaint as broad a cross section as possible of the national leadership and polity in the public and private sectors with the underlying concepts and major governmental activities in human settlements;
- To enlist a broad spectrum of understanding of and support for the national human settlements program as a concrete example of the New Society's concern for the welfare and happiness of the people; and
- To integrate and formulate, based on the resolutions, proposals, discussions in the plenary and working sessions, a document setting forth the national action plan on human settlements and identifying the elements, sectors and groups that will carry out the programmes.

Some 800 participants coming from all regions of the country and from both the public and private sectors joined in the week-long activities which started with the keynote speech of President Ferdinand E. Marcos at the Maharlika Hall in Malacañang. The conference was brought to a close with a formal dinner session with Metro Manila Governor Imelda R. Marcos as guest speaker.

Each day's deliberations centered on a particular aspect of the conference theme such as planning and management of human settlements, economic and technological life-support systems, the quality of life and the environment of human settlements, social well-being, and the youth as the future of human settlements.

An important highlight of the conference was the field trip that enabled the participants to observe on-going government projects related to human settlements. One group visited the Resettlement Project in Dasmariñas, Cavite; another observed the model urban renewal project, the Dagat-Dagatan Kapitbahayan Project in Tondo; while a third group took a guided cruise along the Pasig River to get a glimpse into the anti-pollution and flood control drives of the government.

Juinio Proposes Transport Authority For Metro Manila

Public Works Secretary Alfredo Juinio has submitted a draft Presidential Decree creating a Metropolitan Manila Transport Authority to exercise general jurisdiction and control over all transportation elements from planning and operation to regulation within the Metro Manila area.

The proposed decree is in line with Mrs. Marcos' directive for the adoption of an integrated transport system for Metropolitan Manila. As an integrative body, the proposed transport authority shall regulate the operation of all transport modes plying the area including buses, jeepneys, taxis, rail and water-borne carriers.

Financial support for the proposed authority shall come from licenses and parking fees, charges for vehicle registration and area licensing, and a proposed P1.5 million initial appropriation.

IEP Celebrates Tenth Anniversary

The Institute of Environmental Planning of the University of the Philippines celebrated the completion of its first decade of existence on December 18 and 19, 1975.

Established in 1965 by R.A. 4341, the Institute of Environmental Planning has been engaged in the past ten years in planning

research, consultancy, extension-training, and graduate education.

The two-day affair devoted to showcasing the Institute's varied activities and accomplishments since its inception was formally opened by Dr. Aurora G. Corpuz, First Lady of the University, who cut the ceremonial ribbon.

An important feature of the celebration was the open house where the output of a decade's work such as multi-volumed documents, research reports, development plans and the like, which the Institute either undertook solely or in collaboration with other government agencies were exhibited. Photographs, maps, charts, scale models and other visual aids lent more color to the exhibits. Students' papers and projects were also prominently displayed.

A symposium on metropolitan housing problems was held in the afternoon of the first day. Papers on "Policy Goals and Programs for Housing," and "Social Indicators and Standards for Housing" were read by Maj. Gen. Gaudencio Tobias, General Manager of the newly created National Housing Authority, and Dr. Tapan K. Majumdar, visiting UNDP Consultant on Housing, respectively. A film showing on housing and city life capped the activities of the first day.

The second day saw droves of UP-IEP alumni trooping back to the Institute as it was alumni homecoming day, the first such homecoming in ten years. It was an hilarious affair which started with a fellowship program in the morning and ended with a formal dinner at the Institute for Small-Scale Industries social hall nearby. Seriousness was injected into what could have been a whole day of merry-making by the afternoon session which had the alumni attend a symposium on metropolitan transportation problems. Asst. Secretary Teodoro T. Encarnacion of the Department of Public Works, Transportation and Communications, and Professor Federico B. Silao of the UP-IEP were the principal speakers.

Later in the day, Asst. Secretary Encarnacion was cited as one of the Institute's top alumni. Sharing the same honor was Asst. Director Ernesto Mendiola of the Bureau of Lands.

UP-IEP to Offer Special Planning Course

The Institute of Environmental Planning of the University of the Philippines announces the opening of the Ten-Month Special Course in Urban and Regional Planning effective June 1976.

The latest and the most intensive training program so far envisioned by the Institute, the Special Course focuses on the planning of services such as education, health, recreation, shopping and transport. It has been designed for employees and officials of various government and private agencies engaged in the planning and provision of social services who have no opportunity to join the regular Master in Urban and Regional Planning course offered by the Institute under its graduate education program.

The need for more personnel with broad background in urban and regional systems and with specific skill and expertise in the planning of services has been determined in a preliminary survey of various offices conducted by the Institute early this year.

In offering the Special Course, the Institute seeks to fill this need in the exercise of one of its mandated functions namely, to conduct in-service training in the field of planning. The Institute also seeks to rationalize the current proliferation of ad hoc planning seminars and workshops conducted every now and then by various agencies.

But however great the demand for planners, the Institute shall limit the number of participants to a maximum of twenty-five in order to effectively supervise individual performance especially in the planning exercises and research activities.

As structured by the training staff of the Institute, the Special Course is primarily practice-oriented. However, a considerable amount of theoretical content has been thrown in to keep the participants abreast with the most recent ideas, major issues, and various strategies concerning spatial distribution and functional organization of services in relation to the needs of the population being served.

A training fee of P1,000 shall be charged each participant.

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Draft Physical Perspective Plan for the Philippines Completed

The draft report of the Physical Perspective Plan for the Philippines (PPPP) was completed on March 15, 1976. A major undertaking of the Planning and Project Development Office (PPDO) of the Department of Public Works, Transportation and Communications, (DPWTC), the draft plan with a 25-year time horizon, has been submitted for review to the National Economic and Development Authority (NEDA).

The draft report has been formulated to meet the need for translating long-range development objectives into spatial and locational terms. Specifically, it was prepared in response to Letter of Instruction No. 363 directing all government offices involved in development planning to evolve and submit their respective medium and long-range perspective development plans to NEDA for coordination and integration of all government development efforts.

The proposed Perspective Plan constitutes the first phase of a comprehensive national development plan. This long-term plan integrates land use, settlement network, transportation and communications, water resources, power development as well as planning and implementation machinery. It also covers on a broad scale the economic and social factors which in turn, shall become the emphases of subsequent phases of the comprehensive national development plan.

Adopt Refuse Management Program for MMA

Metro Manila Governor Imelda R. Marcos recently approved the implementation of the refuse management study which calls for an action program to solve the city's present garbage collection and disposal system.

The two-part study is the result of an inter-agency effort coordinated by the PPDO/DPWTC in collaboration with the Department of Public Services of the various cities and municipalities comprising Metro Manila and the Department of Local Governments and Community Development.

Immediate plans for the implementation of the said study calls for the improvement of the present system of garbage collection, the procurement of additional dump trucks with corresponding maintenance and repair shops, and the establishment of sanitary landfill areas. Also included in the plan is the revival of the use of pushcarts for garbage collection in alleyways and other places inaccessible to the dump trucks.

FROM PAKISTAN

LLENA P. BUENVENIDA, Research Associate of the UPIEP (in printed shirt with hat, left photo) poses with fellow participants by the roadside in Pakistan on her way to a study tour of the ruins of Mohenjo Daro (right photo), one of the world's earliest planned settlements. Ms. Buenvenida is currently attending the regional planning course at the United Nations Centre for Regional Development in Nagoya, Japan.

EMMANUEL I. ASTILLERO finished an MBA degree at the University of the Philippines in 1967 and an MEP degree at the Institute in 1975. He has been with the Planning and Project Development Office (PPDO) as Environmental Planner since January 1975. Prior to his stint with the government service, he had been an executive of various firms engaged in printing and publishing, social development, economic programs for cultural minorities, construction, trading, and as a systems analyst in a textile manufacturing concern.

Mr. Astillero writes on the Bicol River Basin Development Program, a subject he knows intimately being the coordinator of the project since he joined the PPDO.

JONA BARGUR is currently Team Leader of the Tahal Consulting Engineers, the Israeli firm that has been conducting jointly with the Philippine Government the preliminary studies for the Pampanga Delta/Candaba Swamp Development Project, which is the subject of his article in this issue of the JOURNAL. Mr. Bargur holds the following degrees: Bachelor of Science in Agricultural Engineering Technion, Israeli Institute of Technology; Master of Science in Civil Engineering, Stanford University; and a Ph.D. in Engineering, Economic Planning and Water Resources Management, also from Stanford.

Mr. Bargur has been with the Tahal Consulting firm since 1960 and has served in various capacities as Senior Systems Analyst and Regional Planner and is responsible for the development of mathematical planning models for Israel's Agricultural Economy, Sectoral Master Plans, and Urban Planning. He has published several papers particularly on Water Resources Research in various professional journals.

WILLIAM L. HORN is a Project Manager for the consulting firm Daniel, Mann, Johnson & Mendenhall that is conducting the Mangahan Flood Control Study, a comprehensive undertaking that seeks solutions for the flooding problems in the Greater Manila area. The project involves economic evaluations, urban planning, and detailed engineering analysis. In his latest assignment Mr. Horn is backed up by more than 25 years of experience in hydrology, hydraulics, flood control, and water resources development.

Mr. Horn's academic background includes degrees in Civil Engineering (University of California, Berkeley) and Mechanical Engineering (U.S. Naval Academy). He has had

ABOUT THE AUTHORS

special training in Engineering Management, Data Processing for Managers, Remote Sensing of the Environment, and Creative Problem Solving. A registered Civil Engineer in the State of California, Mr. Horn is a Fellow of the American Society of Civil Engineers and is a member of the U.S. Committee on Irrigation and Flood Control.

CHONA B. JIMENEZ is a Research Associate of the Planning and Project Development Office, Department of Public Works,Transportation and Communications (PPDO-DPWTC). She holds the degrees of Bachelor of Arts major in History (Maryknoll College) and Master of Environmental Planning (University of the Philippines). Miss Jimenez has been involved in various housing projects of the PPDO and has participated in the formulation of a comprehensive housing program for Metro Manila.

APOLO C. JUCABAN writes on the polar growth concept as applied in the planning of the Manila Bay Metropolitan Region, a project he participated in as Urban/Regional Planner. Mr. Jucaban is on the staff of PPDO as Area Manager of Area A, Manila Metropolitan Region. He is also a lecturer in Environmental Planning at the UP-IEP, where he finished the MEP course in 1973. Earlier, Mr. Jucaban obtained the degrees of Bachelor of Arts in English in 1959, and Bachelor of Science in Geology, 1964, both from the University of the Philippines.

DAVID PINNOCK is an Urban/Regional Planner engaged in the MMETROPLAN Project. He qualified in Town and Country Planning in England and has a Master of Science degree in Social Sciences from Edinburgh University, Scotland. He is currently employed by Freeman Fox and Associates with which he has been connected for the last two years. Prior to this, he had worked with other International Planning Consultants on a number of major urban development projects in the United Kingdom and in other parts of Europe.

RENE S. SANTIAGO is the Systems and Research Manager of the Planning and Project Development Office. Mr. Santiago holds the Bachelor of Science in Civil Engineering degree (cum laude) from the University of the Philippines; a Master's degree in Systems Engineering and Management from the Asian Institute of Technology; and was a Fellow on Urban Management at the Economic Development Institute of the World Bank. He is also a special lecturer at the UP Institute of Environmental Planning.

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