

**COOPERATIVE AGREEMENT ON HUMAN SETTLEMENTS
AND NATURAL RESOURCE SYSTEMS ANALYSIS**

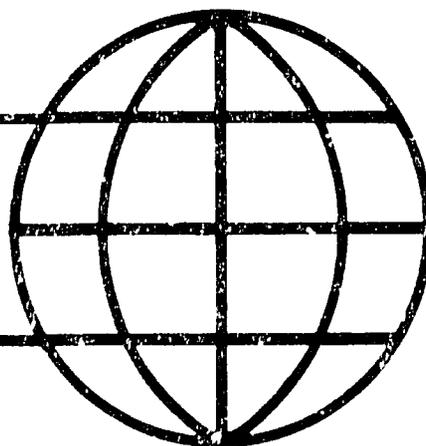
MICROURBANIZATION:

AN OPTIMIZING STRATEGY FOR RURAL AND REGIONAL DEVELOPMENT

by

Robert A. Hackenberg

Regional Cities Project
Clark University/Institute for Development Anthropology
Cooperative Agreement (USAID)



Clark University
International Development Program
950 Main Street
Worcester, MA 01610

Institute for Development Anthropology
Suite 302, P.O. Box 818
99 Collier Street
Binghamton, NY 13902

MICROURBANIZATION:

An Optimizing Strategy for Rural and Regional Development

Robert A. Hackenberg
Institute of Behavioral Science
University of Colorado

Cooperative Agreement on
Settlement and Resource Systems Analysis

Clark University/Institute for Development Anthropology

for

Regional and Rural Development Division
Science and Technology Bureau
U.S. Agency for International Development

1984

TABLE OF CONTENTS

A. <u>Urban and Industrial Expansion: Southeast Asia's Agenda for the 1980s.</u>	1
1. Choice of environment.	2
2. Minimizing the development investment.	5
3. An appropriate conceptualization.	8
B. <u>Subregional Farm Modernization: Prologue to Urbanization in Southern Mindanao.</u>	15
1. Replacement of the peasant mode by the capitalist mode of production.	25
2. Economic integration into the wider regional trade network.	27
a. Land ownership and land transfers.	28
b. Crop production and farm operation.	30
c. Employment and labor force participation.	32
d. Income growth and distribution.	36
3. Demographic integration into the regional population mainstream.	40
a. Population structure.	40
b. Migration.	41
c. Fertility dynamics.	43
d. Education and human capital.	44
4. A balance sheet on agricultural modernization.	45
C. <u>Generating Microubanization: Building upon the Green Revolution.</u>	49
1. Objectives of microubanization from the perspective of national development.	51
2. Needs of existing settlement networks.	52
3. Assumptions guiding microubanization.	55
4. A project inventory for promoting agricultural productivity.	57
a. A transportation terminal.	61
b. A livestock/poultry market.	62
c. An agricultural processing center.	65
1) Feed production and marketing.	66
2) Poultry and egg distribution.	66
3) Fertilizer distribution and vegetable production.	66
4) Meat and Poultry processing.	67
5) Upgrading quality and quantity of production	68
5. Steps toward rural industrialization.	68
a. Basic rural-oriented industries.	69
1) Machine shop for farm equipment/vehicle repair.	69
2) Sheet metal work, tinsmith and welding.	70
3) Sawmill and construction materials warehouse.	70
b. Mini-industrial park.	70
c. Downstream manufacturing developments.	71
1) Home construction.	71
2) Farm implements.	73
3) Furniture making.	73

d.	Technical and financial resources for industrialization.	73
1)	Technical assistance for industrial development.	74
2)	Financial assistance for rural industries.	74
6.	Continuing research requirements for agriculture and industry.	75
a.	An agricultural experiment station.	75
1)	Increasing and maintaining yields.	76
2)	Alternative inputs.	76
3)	Watershed monitoring.	76
4)	Irrigation efficiency.	77
5)	Cropping patterns.	77
6)	Cost-effective operating strategy.	77
b.	A rural technology center.	78
c.	A rural financial laboratory.	78
7.	A balance sheet on microuurbanization.	80
D.	<u>Closing the Region by Connecting Implicit Multipliers.</u>	84
1.	Microuurbanization and selective regional closure.	85
2.	Microuurbanization and regional development objectives.	88
3.	Microuurbanization relies upon personnel already in place, and upon budget resources already committed.	89
4.	Microuurbanization creates the foundation for innovative policy initiatives.	93
a.	Enterprise zones as tools for the spacial organization of settlement systems.	95
1)	Density gradients and income opportunities.	95
2)	The growing importance of circulation as an adaptive response.	95
3)	Instruments available for implementing an enterprise zone strategy.	96
4)	The role of inclusionary zoning.	98
b.	Rural financial districts as tools for promotion of reinvestment	102
1)	Spatial organization for revenue generation.	103
2)	Prevention of leakage from revenue-producing districts.	103
E.	<u>Beyond the Green Revolution: Steps Toward Urbanization and Industrial Growth.</u>	
1.	Creating a high density network of small enterprises.	105
2.	Expanding lower order communities to balance the settlement system.	105
3.	Project level implementation of the microuurbanization strategy.	107
F.	<u>Tables.</u>	108
G.	<u>References.</u>	129

MICROURBANIZATION:

An Optimizing Strategy for Rural and Regional Development

Executive Summary

A. Microuurbanization---A Development Strategy Aimed at Lowest Order Urban Centers.

Lagging urbanization, and particularly slow growth of intermediate cities, is associated with lagging industrialization and unabsorbed rural population surpluses throughout Southeast Asia. Experts disagree on a suitable program for the promotion of lower order urban centers. Strategies based upon growth centers are in disfavor. Other strategies requiring large scale intervention, such as selective regional closure and agropolitan development, also involve prohibitive costs.

This essay proposes microuurbanization as an alternative and outlines a field test of its effectiveness to be conducted in the Philippines. It is a program based on strengthening lowest order urban centers to stimulate farm production, promote raw materials processing, multiply the number of private sector firms and generate employment. It will accomplish this by placing inexpensive catalytic facilities (transport terminals, produce markets, basic support industries and financial/technical services) in linked and mutually reinforcing clusters within market towns located closest to the points of production.

The proposal is advocated for regions which have recently been the sites of investment in Green Revolution farm technology for the achievement of self-sufficiency in rice production. Microuurbanization is intended to build upon the infrastructure of agricultural modernization, utilize the field level organization of government services, and channel the profits resulting from increased rice yields. It will focus these existing assets upon the attainment of a second stage of development objectives linking expanded market town services with rural non-farm enterprises and employment opportunities.

Feasibility of microuurbanization will be enhanced by incorporating substantial amounts of self-financing to be generated through creation of a rural financial market (savings will be solicited as user fees and transaction taxes, and recycled as loans to entrepreneurs). The proposal argues that the multiplied productivity of the market town and rural hinterland can be absorbed because the urban demand for farm products within the region is presently met only in part, and by inefficient means. The proposal for microuurbanization concentrates upon market town facilities (transport terminal, produce market, etc.,) which will most efficiently link an expanding rural supply of diversified products with growing urban consumer requirements. Because of previous heavy investment in the Green Revolution, administrative structures and technical assistance resources required are already in place within the market town-rural village orbit. Therefore, only optimization is required.

Microuurbanization is intended to expand and stabilize the income of farm-based households, beneficiaries of the Green Revolution, without requiring them to migrate to towns and cities which are ill-equipped to receive them. Instead, the proposal will diversify the basis of household earnings by providing (1) production opportunities for rural non-farm enterprises; (2) commercial opportunities for trade in the market town's informal sector, and (3) wage work in expanding basic industries. It is expected that farm households will exploit multiple opportunities through commuting to a variety of nearby work-sites.

Within the Philippines, Southern Mindanao, a region served by Davao City as its administrative center, represents a resource frontier of the type recently transformed for intensive rice cultivation elsewhere in Southeast Asia, e.g., South Sumatra in Indonesia and Kedah in West Malaysia. Two municipalities within this region, located within the Digos-Padada Valley, provide the case material for this essay. Data on the impact of the Green Revolution were obtained by the author through cross-sectional surveys conducted in 1970 and 1980, and by subsequent field visits to May, 1984.

Green Revolution Impact: Platform for Modernization

Two decades ago, the Southern Mindanao region featured semi-autonomous rural villages of subsistence producers with segmented markets for land, labour and capital. Land was a nontransferable family heritage, unpaid family labor was retained within the household for farm operations, and capital was scarce and immobile (uninvested proceeds from sales of surplus rice). Today rural land, labor and capital markets are dissolved within a regional system of exchange. Land is freely traded, labor seeks multiple and diversified employment for cash, and there is a rural financial market for both investments and credit.

These circumstances establish the platform for microurbanization. They are the heritage of the drive toward rice self-sufficiency which was a major preoccupation of Southeast Asian countries during the 1970s, and which resulted in the Green Revolution. The unintended consequence was the penetration of the countryside by the framework of capitalist agriculture under circumstances which were relatively risk free for the producer, e.g., uncollateralized crop loans were the credit instruments made available by the Philippine government. Other innovative administrative programs included land reform, price supports, producers' cooperatives and a labyrinth of extension and farm management services provided at field level.

The economic integration of the village into the region was accomplished by the increasing yields and the multiple cropping of rice. Expanded production was accompanied by rapid gains in farm income and skyrocketing land prices. Despite land reform, farm operators discovered that they could make more money from part of their land under new cropping conditions than they previously earned from all of it in former years. Consequently, many parcels of rice land were exchanged for investment capital with which farm operators diversified their holdings. They bought upland plots to produce commercial crops exempt from land reform (coconut, sugar, coffee, cacao, and rubber), purchased small businesses or farm equipment and supplies for rental or resale.

Less sophisticated farmers (usually former tenants) who could not cope with high technology rice production or make payments on parcels received from land reform also sold out and were added to the sharply expanded farm labor force. All households increased their commitment of manpower to the labor force by more than 60% of the 1970 base! The largest group of new income producers consisted of housewives engaged in the production of vegetables, pigs and chickens, and also in trading in the marketplace---both indicating the expansion of informal sector activities. The number of new enterprises doubled over the decade, providing formal sector employment for new wage workers, and multiple occupations for one-third of those designating farm work as their primary income source.

The demographic integration of the village into the region also occurred along several dimensions. Birth rates declined by half, and marriage age rose to urban levels. Households formed by marriage left the Digos-Padada Valley for external destinations in more than 50% of the cases. Half the emigrant households chose city destinations, and 70% if the emigrant males obtained nonfarm employment. Median educational attainment advanced to completion of secondary school for the average young adult age 20-24.

The doubling of rice yields and expansion of multiple cropping, combined with diversification of the non-farm economy, resulted in the tripling of median household income between 1970 and 1980. At the same time, measures of dispersion confirmed that income distribution had become more equitable across the same interval of time. These positive indicators are, in part, the result of success in holding population constant through changes in family planning and marriage pattern together with emigration.

C. Generating Microubanization: Building Upon the Green Revolution.

Recent achievements in agriculture could spur the long sought takeoff into self-sustained growth. But the takeoff will be aborted unless supplemental programs bridge the gap which separates the Digos-Padada Valley from a balanced economy with greater emphasis upon commerce and industry. Today, gains initiated by Green Revolution investments are in jeopardy. A monocrop economy of rice production based upon supported prices and subsidized credit must be rapidly diversified by addition of self-financed ventures which are based on agriculture, but are also profitable under free market conditions.

The lowest order urban place---the market town---provides the site for harnessing larger city demand to stimulate rural productivity. Spatially coordinated facilities within the market town will release implicit multipliers to accomplish this. In the few large cities of the Philippines, this coordination is achieved by the plaza complex: centralized location of transport, marketing, administrative and financial services. More recent provincial towns, growing spontaneously in the age of truck transport and bus service, have formed linear patterns which parallel the highways.

The microubanization proposal emerges from (1) the lack of a plaza complex configuration for stimulating local industry in existing market towns; (2) the superiority of a strategy aimed at penetrating the large city market with farm products; (3) the existence of a substantial demand for animal protein in the urban market; (4) the capacity to produce pigs and chickens demonstrated by women in farm villages. These considerations target the market town as the appropriate point for an intervention strategy.

An experiment to test the effectiveness of this strategy is proposed for the market town of Bansalan, serving the rural villages of the Digos-Padada Valley. It requires the introduction of three components of the plaza complex in rudimentary form: (1) a transport terminal, (2) a livestock/poultry market, and (3) a financial and technical center. These components provide a nucleus of interacting and interdependent improvements which will promote second stage growth in the region based on commerce and small-scale industry.

1. Transport terminal. The intent is functional and does not require an elaborate structure. The purpose is to concentrate arrivals and departures of public transportation at a central point within the community where commerce can take place. The terminal's importance rests on establishment of contiguity between transportation and marketing. The primary attribute of the terminal is location and its main requirement is space. Construction on the site should be minimal. A transaction tax to be collected from all vehicles using the terminal will provide financing sufficient to repay the modest cost of construction, operation and maintenance.

2. A livestock/poultry market. A rudimentary market facility adjacent to the transport terminal will stimulate production by providing a permanent point-of-purchase for producers in the surrounding countryside who presently depend upon itinerant buyers who negotiate sales at the farmgate. Concentration of volume sales at the town market will permit the collection of truckload lots of animals for transport to Digos and Davao City, the provincial and regional urban centers. The market should emphasize these exchange functions and restrict concern for appearances and investment in physical facilities. A transaction fee should be collected from sellers for use of the facility, and from buyers as a small percentage of the transaction.

3. A financial/technical center. Market operations are restricted in volume by limited cash flow. Buyers are inhibited by lack of capital, but the 24-hour nature of transactions (pigs and chickens purchased in Bansalan would be sold on the same or the following day), encourages making short-term credit available. Loan funds could

be generated by the transaction taxes; 10-20% interest would make funds attractive. The financial service should also provide savings-and-loan functions for livestock and poultry raisers. Interest rates paid should be high enough to encourage deposit of a portion of all sales in individual accounts.

Improving quality will also expand sales volume, and can be accomplished at low or no cost. Technical assistance to pig and poultry raisers should be available through an office to be consolidated with the financial service adjacent to the market and terminal. The office will be staffed with permanent personnel from the Bureau of Animal Industry (BAI) and the Bureau of Agricultural Extension (BAEX). These employees are technically competent but presently dissipate their energies by "circuit riding" over a large and poorly served area.

A feed mill should be added to the livestock-and-poultry market, to be supervised by the BAI/BAEX technicians. Rice husk and corn are both available locally, and appropriate supplements can be added during the milling process. A veterinary (preferably a BAI employee) should be permanently available at the market site, and should have supplies and medicines available for sale.

Initial recommendations for these components are made with the intention to rapidly stimulate productivity and generate income. A substantial proportion of this can be recaptured as savings and revenues for (1) later replacement with permanent and more elaborate facilities as warranted by business volume, and (2) systematic expansion of enterprises in the complex through self-financing. A plan for this expansion, already formulated in outline, visualizes establishment of firms engaging in activities which add value to farm products. It is described as a fourth component below.

4. An agricultural processing center. Success of the three primary components can be measured from their capacity to produce capital above and beyond requirements for their own continuing operation and expansion. If they are successful, investment should continue in a range of downstream benefits which will both expand the role of the private sector and generate employment. Opportunities include the following:

- a) a feed production and marketing center.
- b) pullet and egg production.
- c) organic fertilizer collection and distribution.
- d) integrated vegetable production and marketing.
- e) meat and poultry processing.
- f) animal dispersal program to initiate cattle raising.

The degree to which the Digos-Padada Valley has become incorporated into the regional economy leads to the prediction that a number of these enterprises will become both vertically and horizontally integrated. Entrepreneurs seeking to expand the scale of their operations will look for permanent outlets in the major cities and will also purchase refrigerated storage facilities, operate trucks, etc. Inevitably, established corporations from the larger cities may penetrate the market towns and absorb some of the agricultural processing operations into established commercial networks. Since this will also serve to expand the niches which local entrepreneurs can fill with support and maintenance services, and will both expand and increase the security of employment, it should be encouraged. And the rapid expansion of farm production and agricultural processing will provide a foothold for the establishment of affiliated industries, as outlined below.

5. Basic rural-oriented industries. Despite a high level of mechanization and substantial volume of local truck traffic, existing support resources are minimal at best. They will be overstrained by the added burden imposed by the new facilities to be installed. This stress also represents a demand which can be translated into opportunities for another set of new enterprises, but at this stage

basic industries rather than additional agricultural processing operations are needed. The following enterprises will permit continuous operation of local farm and business equipment, encourage construction of farm, commercial and residential buildings, and diminish dependence on remote urban points of service.

- a) machine shop for farm equipment and vehicle repair.
- b) sheet metal, tin and welding shop.
- c) sawmill and construction materials warehouse.

As with the plaza complex components, the basic rural-oriented industries are also interdependent and mutually supportive. And once again, they are expected to expand in a fashion which will encourage downstream diversification into larger scale firms for which an industrial park will be appropriate.

6. Plans for a mini-industrial park Downstream industries will require more investment in labor, will generate more skilled jobs and will produce finished goods in multiple units (the basic industries are essentially custom shops, making single items to order). These larger scale firms will have space, transportation and utilities requirements that go beyond what has previously been provided. The type of industrial park proposed will be a serviced site (high pressure water line, industrial power supply, and highway access), located as near to the terminal-market and basic industries complexes as possible. Priority manufactures are indicated below:

- a) home construction industry.
- b) farm implement manufacture.
- c) furniture manufacture.

The microurbanization proposal follows the World Bank's admonition that economies of scope can be more important than economies of scale: "scope" refers to the catalytic impact achieved by increasing the density of enterprises within the community so that supportive interactions can develop between them. To achieve this goal, the choice and location of enterprises may be more important than their actual number. Implicit multipliers would be maximized if the layout of the industrial park preceded introduction of the basic rural-oriented industries (see #5 above). These firms could then become the nucleus upon which the production-oriented enterprises to follow could expand. Advantages of scope would be maximized by this strategy.

An evolutionary process for achieving the transition from agriculture to industry in the Digos-Padada Valley will emphasize the role of self-financing and private enterprise. However, to translate a programmatic statement into reality requires both investment and technical assistance to initiate and guide the process. It is because both of these are presently available for industry (they have already been described for agriculture) that microurbanization can be designated as an optimization strategy, to be executed by skillful arrangement and combination of existing resources.

The Ministry of Trade and Industry, through its Small Business Advisory Centers (SBACS), provides technical assistance to small scale industry in each of the twelve administrative regions outside Manila. SBAC services include business diagnosis, management training and preparation of loan applications. Entrepreneurs may obtain financing from the World Bank's small and medium enterprise support program. The Bank's third and most recent commitment of funds is \$7.0 million. Additional assistance became available in 1983 from the USAID Small and Medium Enterprise Development (SMED) program.

7. Research and Development Program. All stages in the industrial development program for the Digos-Padada Valley depend upon agriculture, first to provide raw materials and investment capital for processing enterprises, and second to provide demand for local manufactures. Yet, the Green Revolution technology responsible for recent gains is essentially destabilizing over time through excessive reliance on a single crop and overuse of chemicals. The compensation required is a continuous

research program. Because of the differential characteristics of microenvironments, research must be conducted at the local level. The following solutions are required for the success of the microuurbanization strategy:

- a) an agricultural experiment station.
- b) a rural technology center.
- c) a rural financial laboratory.

The experiment station will be responsible for maintaining yields, providing alternative inputs (especially seed varieties and chemicals), watershed monitoring and irrigation efficiency. A monitoring and research schedule could be prepared at the International Rice Research Institute (near Manila) and implemented by local BAEX and BAECON personnel at very little cost. Local farmers will participate as volunteers. The technology center is intended to adapt farm implements and irrigation methods to local conditions. The National Irrigation Administration (NIA) and Farm Systems Development Corporation (FSDC) have technicians in the region who could staff this venture at little additional cost.

Cost recovery for investments required by microuurbanization is imperative. But capital formation is equally important for the promotion of self-sustained industrial growth. Access to external financing can provide start-up support, but internal funding is needed to repay loans and permit downstream expansion. To reach these objectives, savings must be mobilized effectively within the farming community. An inventory of successful experiments in the formation of rural financial markets has recently been assembled by the World Bank. A selection from among these should be introduced as alternatives to the existing (ineffective) rural banks.

The theoretical linkage between the elements of the microuurbanization process is derived from a cybernetic perspective. Growth within a regional system creates imbalance between that system and its environment. Treatment of either the system or the environment to restore balance increases the level of human control over both and permits growth to continue. As development proceeds, and subsequent imbalances are rectified, there will be gradually increasing control of both system and environment by a loosely coordinated network of public agencies. Microuurbanization represents a purposive mechanism used for increasing the efficiency and reducing the cost of this coordination. The core of this process consists of strengthening spatial linkages between private sector businesses conducted in both farm village and market town by utilizing government support services from existing agencies. These linkages represent implicit multipliers generating self-sustained growth.

D. From Microuurbanization to Selective Regional Closure: An Inside-Out Strategy.

When viewed in total perspective, microuurbanization offers an opportunity to achieve selective regional closure. It begins with an irrigated farming district and moves it rapidly toward self-sufficiency in manufacturing its own capital and intermediate goods while preventing leakage of its profits to higher level centers. At the same time, it benefits the region by providing an enriched inventory of consumer goods to its larger cities. The steps outlined to accomplish this utilize minimal intervention and proceed from the bottom up. To counter objections leveled at integrated area development and agropolitan models (they are costly attempts to manage regional-level changes), microuurbanization moves by stages from the inside (the farming villages) outward (to the market towns and beyond).

While the proposal stresses reliance upon administrative and technical personnel already in government employ, it does not seek new goals by doubling the responsibilities of existing staff. Rather, it is assumed that since the majority of field level technicians were assigned to instruct Green Revolution participants who have become modern cultivators, they are available for redeployment to second stage responsibilities. Microuurbanization provides the agenda.

The implications of microubanization may be pursued by seeking its outer limits. Projects are to be initiated at the base of the region's economy, transforming the economic output from its farming villages. How far can we move outward and upward with this strategy, extending it toward the largest urban center? While requiring intervention at a much higher point in the administrative structure of the region, the proposal can be expanded by projecting its mechanism---generating private enterprise and employment---upon a larger territory.

Two larger-scale concepts may be suitable experimental instruments for exploring the upper limits of the microuban strategy. They are outlined below.

1. Regional enterprise zones to improve the spatial order of settlements.

With the regional capital as a base point, a zonal model might be constructed which would promote systematic differentiation of hinterland sectors for maximum economic interdependence and growth. Each successive zone, moving outward from the urban center, may be used to promote a separate category of enterprise. The underlying principle to be utilized in designing the zones is the relationship between the spatial gradient and household income: the combined income of rural households is greatest for those closest to the city from both farm and non-farm sources. The income gradient is closely associated with opportunities for commuting (part-time employment in the city) and commerce (sales of handicrafts and produce in the city).

Application of this principle suggests the use of zoning to encourage the distribution of separate but interdependent growth segments along a density gradient extending outward from the major city. Two higher density (inner) and two lower density (outer) segments might be designed as follows:

- a) inner high density segments.
 - 1) urban fringe with craftwork, artisanry and light industry and heavy commuting.
 - 2) rural households producing garden and specialty crops (flowers, fishponds) for the urban market; lighter commuting.
- b) outer low density segments.
 - 1) individual farm owner-operators producing cereal crops and meat animals for the urban market (this zone contains the Digos-Padada Valley); it provides urban migrants but not commuters.
 - 2) remote area reserved for plantations, timber concessions and extractive industries.

Since outer, low density segments are the target of the body of this discussion centering on the relationship between the market town and the owner-operated farm, our immediate concern is with the inner, high density segments.

The policy instruments proposed are intended to implement a non-disruptive emphasis on inclusionary zoning: identifying appropriate enterprises for inclusion in each successive zone surrounding the central place and encouraging their development with available incentives. Criteria for "appropriateness" include use of local materials, labor intensity, minimum capital/technology requirements, and existence of urban demand. Incentives to be provided include SBAC assistance and World Bank and USAID financing. A separate loan guaranty program utilizing private credit sources is a promising alternative.

Development of enterprise zones would encourage higher density population concentrations external to the major urban centers but sharing in the benefits of urban facilities and higher order economic and technical functions. It would also maximize the use of local raw materials for conversion to urban consumer goods. This, in turn, represents another practical method of promoting selective regional closure.

2. Rural financial districts as tools for promoting reinvestment. Capital formation across a broader base must accompany any effort to apply the premises of microubanization at the regional level. While impressive gains in personal and household income have been achieved in recent decades, local financial institutions are associated with disincentives for savings (low interest rates, disinterest in small accounts, etc.,)

Higher savings ratios may be obtained by recourse to several inexpensive measures. The chief innovation proposed is the organization of rural financial districts, establishment of savings ratios for member households, and rewards for compliance with district targets. Rewards could take the form of premium interest rates, preferential treatment for loans, etc., Since rural households are presently registered with the Ministry of Agrarian Reform, and data are on file concerning their land holdings, use of credit and eligibility for loans, the policy should be feasible to implement.

E. Beyond the Green Revolution: Steps Toward Urban-Industrial Growth.

Despite the success of the Green Revolution, the substratum economic structure of the countries of Southeast Asia remains much the same as in the 1960s. Large and growing populations are predominantly rural and economies are essentially agricultural. Industries are under-sized, ill-distributed, and characterized by sluggish growth. The transition toward urban-industrial maturity must be rapidly negotiated.

An attempt to implant a log-normal distribution of urban settlements within this rural context is foredoomed. Massive foreign financing is unavailable, and suitable plans based on successful prototypes cannot be produced. Microubanization is advanced as an alternative which, if successfully implemented, will achieve the goals of a complex settlement hierarchy without the costs or the administrative complexity: (1) it will stimulate agricultural productivity; (2) expand the number and size of private enterprises, and (3) generate non-farm employment.

The proper foundation for industrial growth in the regions beyond the primate city is a multiplicity of small-scale industries extending horizontally across areas with a prosperous agricultural base. Once established, these firms will become vertically and horizontally integrated, at the same time expanding rural-urban linkages and creating demand for expansion of urban services. However, in the 1980s this process does not require major rural-to-urban population transfers. Microubanization can be accomplished by bringing the locus of industry to the farm owner-operators' vicinity. This is the reverse of the traditional urban-industrial development process in the West.

It is possible to invert traditional arrangements in Southeast Asia because transmissible supplies of power, and transportation and communications networks permit the ingredients of industry to be distributed to a diffuse network of farmhouse and market town producers. Recent evidence from the Southern Philippines indicates that, during the 1970s, industrial employment grew faster in rural than in urban areas. An intervention strategy which will continue the expansion of industrial employment on farms and in rural service centers and market towns is perceived as complementary to forces already at work. Microubanization is proposed for this purpose.

MICROURBANIZATION

An Optimizing Strategy for Rural and Regional Development

Robert A. Hackenberg
University of Colorado

A. Urban and Industrial Expansion: Southeast Asia's Agenda for the 1980s

Few experts still adhere to the classical position that urban-industrial growth alone will suffice to pitchfork a backward economy into a competitive role in the late 20th century. But still fewer would affirm that economic modernization can be accomplished without an appropriate system of urban settlements to complement rural resource-based strategies. Since primate cities were the beneficiaries of the rejected urbanization policies of the past, the present focus is on lower order urban centers, designated as intermediate or secondary cities (Rondinelli 1983).

In development programs of the next several decades, it is expected that innovative planning for secondary cities will (1) redistribute industry, bringing processing into a more effective relationship with resources; (2) provide the technical, financial and institutional support required to modernize agriculture; (3) generate employment in areas with an excess of rural labor; and, as a consequence of these steps, (4) divert rural-to-urban migrants away from primate cities, while (5) simultaneously reducing interregional imbalances in levels of economic advancement. At least, these were the expectations expressed by experts participating in four recent conferences sponsored by the East West Center and the United Nations Centre for Regional Development since 1980.

These expectations have yet to be fulfilled. Few attempts have been made by planners and administrators to employ secondary urbanization as an instrument for promoting regional economic growth. Experiments initiated thus far link the concept with attempts to improve or "complete" the hierarchy of urban settlements as described by Rondinelli (1984: 14):

"...a well-articulated and integrated network of geographically dispersed but physically linked rural service centres, market towns, regional cities and and larger metropolitan areas---so that the benefits of development can flow from both urban centres to rural areas and from agricultural hinterlands to larger cities."

Hackenberg and Hackenberg (1984) described a less than successful attempt to plan, to develop and to utilize growth centres to promote the formation of urban-rural

linkages in Western Panama between 1978 and 1983.

The Panama experience confirms Higgins' (1983: 9) recent opinion on secondary urbanization conceived as a comprehensive, multisectoral and multilevel development effort:

"Little hard analysis has yet been conducted on how diverting growth... to rural centers, growth centers, small towns and middle-sized cities is supposed to promote development...."

The January 1983 UNCRD seminar in New Delhi examined the topic of small and middle-sized cities in development. The growth pole/growth centre concept was much in evidence...And in the case studies presented...there were examples of sizable industrial satellite towns on the borders of the capital city...and remote rural hamlets....The continued failure of those of us working at the theoretical level to provide clear and operational concepts...can lead to confusion in planning and policy-making as well."

He maintains that immediate prospects for advancing the conceptualization of secondary urbanization are not good for the empirical base is lacking. Before we can generalize, we must have detailed descriptions of systems of interacting settlements (1) of different sizes and infrastructure endowments; (2) in a range of resource configurations; (3) under a variety of demographic conditions; (4) at different levels of development, and (5) in varying spatial contexts.

He concludes with the admonition that

"In the next decade or so, the accumulation of case histories is likely to add a good deal more to our capacity to deal with urban, regional and national problems of particular countries at a particular moment in time than further search for typical behavior by cross-sectional analysis of large numbers of countries together" (Higgins 1983: 10).

To convince both experts and administrators of the wisdom of pursuing secondary urbanization strategies, it is necessary to demonstrate that they have a high probability of attaining a favorable outcome. To maximize our prospects it will be necessary to (1) choose an appropriate environment; (2) hold costs to a minimum, and (3) present an appropriate conceptualization. If these terms can be satisfied, it may be possible to initiate urbanization experiments which, if successful, can be replicated across that class of environments which are analogous to the case selected.

1. Choice of environment.

It follows from Higgins' assessment of the state of the art that we are in no position to advocate universal prescriptions for intermediate urbanization. The World Bank (1975) recognized a decade ago that different geographical zones have specific urbanization potentials. In the chart reproduced below (table 1) from

Gilbert (1978), the zone designated Type II, including much of Southeast Asia, consists of countries in which relatively modest assistance could catalyze the urbanization process as a stimulus to sustained rapid growth.

Table 1. A Typology of Economic Development and Urban Growth Potential.

Type I. Those countries in which the process of urbanization is well underway. The population is already more than half urban, incomes relatively high and there is little pressure of population on arable land and natural resources. The end of the urbanization process will occur before the turn of the century when most of the population will be in urban areas and rural areas will begin to experience absolute declines. Category includes most of Latin America.

Type II. In these countries the urbanization experience is more recent. Over half the population is still in rural areas. Population pressures exist on the land and incomes are at relatively low levels. If population pressures can be eased and resource constraints overcome, this group of countries by the turn of the century should obtain levels of urbanization similar to those found in the Type I countries today. Category includes the semiindustrialized countries of Asia and North Africa such as Egypt, Korea, Malaysia and the Philippines.

Type III. This group of countries is predominantly rural but urbanizing rapidly. Even so, by the year 2000 they will still be predominantly rural with high rates of growth of the rural population. The outcome of the race between population growth and resources (and the resulting growth of per capita income) is uncertain. Category includes most of Africa south of the Sahara.

Type IV. These countries are dominated by severe pressures on the land in largely rural, subsistence-level-income societies. If the projected population growth rates are sustainable they will still be characterized in the year 2000 by large and growing rural populations living in absolute poverty. Category includes most of the large countries of Asia.

Within Southeast Asia, the country which could most benefit from such assistance is the Philippines. The case was strongly stated by the Far Eastern Economic Review (1984: 16):

"Southeast Asia achieved remarkable growth rates throughout the boom years of the 1960s and early 1970s and, though its economies are still largely export-oriented, still managed to chalk up growth rates of 4-6% during the years of the recession, except for the Philippines. Similarly, while standards of living and per capita incomes have improved enormously over the past two decades, the majority of the Philippine population has failed to win a greater share of the country's relatively modest improvement in its gross national product....The result is that while Southeast Asia enjoys manageable national debts, the Philippines owes US\$24 billion."

Like the rest of Southeast Asia, the Philippines experienced a growth spurt in agriculture during the 1970s, fueled by the seed-fertilizer revolution. The World Bank (1982: 41), in Table 2 reproduced below, confirms that this area had the fastest regional growth rate for agriculture in the developing world between 1970 and 1980.

Table 2. Growth rates of agricultural and food output by major world regions (excluding China), 1960-80

Region and country group	Agricultural output				Food output			
	Total		Per capita		Total		Per capita	
	1960-70	1970-80	1960-70	1970-80	1960-70	1970-80	1960-70	1970-80
Developing countries	2.8	2.7	0.3	0.3	2.9	2.8	0.4	0.4
Low-income	2.5	2.1	0.2	-0.4	2.6	2.2	0.2	-0.3
Middle-income	2.9	3.1	0.4	0.7	3.2	3.3	0.7	0.9
Africa	2.7	1.3	0.2	-1.4	2.6	1.6	0.1	-1.1
Middle East	2.5	2.7	0.0	0.0	2.6	2.9	0.1	0.2
Latin America	2.9	3.0	0.1	0.6	3.6	3.3	0.1	0.6
Southeast Asia	2.9	3.8	0.3	1.4	2.8	3.8	0.3	1.4
South Asia	2.5	2.2	0.1	0.0	2.6	2.2	0.1	0.0
Southern Europe	3.1	3.5	1.8	1.9	3.2	3.5	1.8	1.9
Industrial market economies	2.1	2.0	1.1	1.2	2.3	2.0	1.3	1.1
Nonmarket industrial economies	3.2	1.7	2.2	0.9	3.2	1.7	2.2	0.9
Total world	2.6	2.2	0.7	0.4	2.7	2.3	0.8	0.5

The agricultural success story in the Philippines, which saw rice production improve from 1.1 to 2.0 tons per hectare, was not shared with other dimensions of the economy or society. Of the net total employment generated between 1956 and 1976, only 14% was absorbed by industry, with 46% going to agriculture and 40% to services occupations (World Bank 1980: 176). Although population growth prior to 1970 averaged 3.5% per year, the level of urbanization in the Philippines (which never exceeded 34%) actually declined after 1970 (World Bank 1980: 140).

It seems clear from the foregoing that sustained economic growth in the Philippines rests upon stimulation of non-farm employment and strengthening of the urbanization process sufficient to achieve it. But, as Hackenberg (1982) has argued elsewhere, such a policy must be applied selectively since no country has financial resources adequate to implement secondary urbanization on a national scale. Once again, a choice among regions should be made so as to maximum the probability of highest returns on the urbanization investment.

A recent UNCRD study (Lo, Salih and Douglass 1978: 49-52) recognized four classes of region which provide a basis for selection. These were revised at the East West Center Conference on Intermediate Cities in Asia (July, 1980) as follows:

- A. Metropolitan Region. The primate city area, national capital and major industrial center may also contain the bulk of the country's urban population. It is the locus for finance, commerce, transportation and communications, and destination for rural-to-urban migrants.

- B. Metropolitan Shadow Area. The surrounding agricultural zone is penetrated by suburbs and industry, providing for both employment and commerce. As provider of foodstuffs to the metropolis, its farming is also prosperous. It also contains substantial urbanization, e.g., satellite industrial cities.
- C. Downward Transitional Area. Beyond lies an economically deteriorated zone which produced the plantation, timber and mineral wealth of colonial times. In this area landlordism and tenancy produced peasantry, poverty and surplus population. It provides the case materials for underdevelopment (Frank 1966), and the bulk of rural-to-urban migrants. It is moderately urbanized, e.g., once-prominent seaports of the colonial trade. Suffers from erosion, soil deterioration and resource depletion.
- D. Resource Frontier. This most distant zone from the primate city has been recently settled by migrants diverted from the metropolitan region. With the bulk of its resources intact, it requires both agricultural infrastructure (roads, irrigation, power) and urban places for rapid development (see Salih, Pakkesem et al 1978). It has minimal urbanization, e.g., one or more regional administrative centers linked with market towns.

The maximum return from development investment in the Philippines---whether in agriculture, industry or intermediate cities---can usually be derived from the resource frontier which, in this case, is Southern Mindanao. But this situation is not unique. Among many of the countries falling into Type II in Table 1, the future of these zones is synonymous with the economic destiny of the country, e.g. Malaysia, Thailand, and Indonesia. They are also prime targets for intermediate urbanization.

2. Minimizing the development investment.

Because they represent by-passed areas in previous planning, resource frontiers are often thought of as requiring "total solutions", i.e., comprehensive plans and heavy investments. And here is where a third level of problem, more substantial than the conceptual and strategic issues addressed above, is encountered. Financing for such total efforts of the sort available a few short years ago is unlikely to be seen again during the present decade.

The primary obstacle to the funding of regional plans involving secondary cities is the financial condition of the recipient country. Many prime targets in both Latin America and Southeast Asia have encountered balance of payments problems, debt

service ratios and credit ceilings which will drastically restrict future borrowing for any purpose. A recent Philippine example is the Regional Cities Development Program, for which a \$67 million World Bank loan was signed in August, 1983. Because of the present fiscal crisis and impending IMF intervention, payment on the loan has been stopped by the government. Panama took the same action during the summer of 1983, blocking receipt of further payments on development loans already in the pipeline.

Commitment to decentralization and improvement of interregional balance through development of resource frontiers has been a ubiquitous element in national development plans throughout Southeast Asia during the 1970's. The expansion and strengthening of systems of urban settlements have been accepted as means toward these ends (Salih, Pakkesem et al 1978). The instruments to be employed for urban development include construction of growth poles, dispersal of industries, regional specialization to promote trade and selective regional closure to prevent leakage to the metropolitan region (Lo and Salih 1978).

Large scale interventions entailed by each of these policy options, or by combinations of them, are logical responses to present problems but they may not be practical ones. Proposals of this sort tend to emanate from ministries or departments of planning in each of the developing countries; while planners are well-placed to advance concepts, they are unable to control the allocation of resources and the implementation of programs in which they have an interest.

Financial resources are administered by central budgeting offices who allocate them to "line" ministries responsible for sectoral programs: housing, agriculture, energy, highways, irrigation, trade and industry, finance, etc., The projects which are implemented are more apt to originate from the priority lists of individual sectoral ministries than from the multi-sectoral, spatially oriented proposals of planners. Program outcomes occur at the local level at future points in time, subject to tendencies within the region and also in the world economy.

Firmalino and Agpalza (1974) observed that spatial modification and shifts in regional position within a developing country are more likely to be the unintentional consequences of the convergence of priority projects advanced by individual ministries than to be the results of regional planning. For example, in Mindanao during the 1970's, a comprehensive infrastructure program was completed which opened vast rural areas for resource development. While a systematic and unified

configuration of highways, electrification and irrigation was the outcome, each component was contributed by a separate ministry with independent financing, and according to its internal determination of priorities.

In view of the financial and administrative obstacles to effective regional planning, it seems unlikely that its advocates will succeed in establishing a position at the center from which they can dictate coordinated policies to the separate sectoral ministries. However, if they are unable to work effectively from the "top down", they may be able to exert some influence from the "bottom up" (Stohr and Taylor 1981).

To accomplish this, the planner must shift his position from the center to the periphery. Instead of asserting what is desirable he must determine what is probable. He must learn which projects are in the pipeline and scheduled for implementation within a strategic region and what their potential impact will be on the existing economic structure. To fulfill the latter requirement, field level studies must be related to individual ministry agendas for the region.

A planning perspective can be generated from anticipating the consequences of present economic trends within the region as they may be deflected or modified by implementation of enacted policies and funded programs. The planner's role then becomes one of suggesting sequencing, phasing, coordination, or shifts in emphasis among these to extract the implicit multipliers which can be obtained from proper arrangement.

Promoting lower order urbanization by optimizing the impact of the portfolio of ministry projects already budgeted for a region can be achieved without special pleading for a competitive budget allocation of the magnitude proposed for the World Bank's Regional Cities Development Program. Urban planning as optimization is a minimalist strategy. Yet, if based on solid case studies and located within a region which (1) possesses sufficient resources, and also (2) represents an adequate level of prior public investment in infrastructure, it can be both potent and cost-effective.

Frontier zones which have responded successfully to the seed and fertilizer revolution have demonstrated the adequacy of their resource base and infrastructure in the most effective way: by achieving a significant economic growth spurt. This accomplishment is already in jeopardy because it was built with components which

tend to create disequilibrium at the same time that they are generating income. Among these are the environmental impact of intensive rice monocropping with chemical inputs, the economic effects of subsidized credit and price supports, and the social and political consequences of factor biases which favor landowners at the expense of tenants and laborers (Falcon 1970; Myint 1970; Scott 1976; Ruttan 1977).

The underurbanized and one-dimensional nature of the economies in these areas increases their fragility and vulnerability to both internal and external forces. These economies can be stabilized and their growth sustained by the use of a minimalist strategy called microurbanization to be introduced below. The argument will then turn to the consideration of the Southern Mindanao case study and the applicability of the concept.

3. An appropriate conceptualization.

The objective of a minimal urbanization strategy for Green Revolution farm areas is expansion of the monocrop economy and generation of non-farm employment intended to achieve (1) continued economic growth and (2) diversification of the basis of household income to reduce its vulnerability to market fluctuations and policy changes. This may be accomplished by opening any or all of the following additional enterprises: new cash crops to distribute household income across a broader base; raw materials processing to add value and expand markets; procurement and sale of inputs required by farm operators; provision of support services required for production and distribution.

Microurbanization is defined from the point of view of the farm household as an income growth and risk-spreading strategy. Its success will be measured by the number of members of a household labor force who progress from dependency on a single cereal to a variety of rural non-farm income sources. To rephrase the concept as a development strategy, we may try to create the conditions which accomplished the absorption of underproductive rural labor in Japan and Taiwan. Oshima (1971: 170) describes them as an

"...overlapping three-ring circus in which the first ring is the agricultural sector...the second ring is the non-farm labor-intensive sector, and the third is the capital-intensive sector. In the second labor-intensive sector, proprietors and their family help and employees work for each other and buy each other's products, whether in manufacturing, transport, services, construction or trade. This sector overlaps considerably with the agricultural sector, buying food, raw materials and other inputs and employing off-season farm workers while selling manufactured food, clothing, housing, implements, etc. In fact, the relationship of these two labor-intensive

sectors is much closer than their relationship with the capital-intensive sectors with their modern methods of production and Western products. The third ring is relatively small in area, perhaps no more than one-tenth to one-fifth of the sum of the two labor-intensive sectors...With the beginnings of an agricultural revolution in many parts of Asia, the repercussions on the small unit sector are likely to be exciting, especially if efforts to increase the efficiency and productivity of these units are energetically promoted....In both Japan and Taiwan, sustained increases in agricultural productivity have raised the demand for the output of small industries in the nearby towns and villages, and this, in turn, has enabled small industries to hire more workers from farm families during the slack seasons."

Oshima (1971: 172-173) argues further that the combination of agricultural modernization and expansion of small, rural-based industries creates (1) substantial improvements in the income distribution at the lower end of the distribution and (2) substantial improvements in the personal savings rate.¹ Both these latter benefits establish the platform for a third stage transition to urban-industrial growth within larger cities by expanding demand and generating capital.²

Given the present excess of rural population and the sluggish, even regressive, pace of urbanization, the second stage which bridges the gap between agricultural modernization and urban industrial take-off becomes all important. This is the stage of microubanization requiring intensified interaction between the first two rings of Oshima's "three-ring circus". Intensification occurs when members of the same household can channel their savings and their surplus labor from agriculture into small industry, while, if possible, earning wages from rural-based large scale enterprises at the same time.³

Since agricultural modernization through Green Revolution technology is already present, it is the small industry component which must be strengthened. The present small scale of Philippine manufacturing is evidenced by the most recent (1975) data which confirm that 67.1% of productivity in 20 basic industries takes place in units with four workers or less (World Bank 1980: 214). Clearly, these

-
1. Adams (1978) gives examples of successful rural savings programs from Taiwan, Japan, Sri Lanka, Korea and Malaysia. Rural financial markets require an institutional base---either rural banks or farmers' cooperatives---with administration provided by government agencies. He concludes, "Any savings mobilization effort will work better where rapid agricultural growth and increasing rural incomes are occurring."
 2. The transition from small, rural-based production to Western-style urban-industrial growth, as it occurred in Korea, Japan and Taiwan is described in Oshima (1983).
 3. Such enterprises may include plantation agriculture, timber concessions, sugar or oil palm refineries, paper pulp production, rubber processing, or mineral extraction in the Southern Mindanao region.

are informal sector enterprises well-suited for placement within the smallest-size urban places. As Oshima (1983: 585, 592) observes, the gas/electric technology of small scale equipment permits both farm and manufacturing tasks to be performed by small groups of workers in dispersed locations. Paul Liu (personal communication) reports that in Taiwan many of these "manufacturing enterprises" run by family labor are located on farms at short distances from small urban places.

A major theme at recent conferences on intermediate cities has been the need to reduce labor market fragmentation (between rural and urban sectors) and to increase labor force mobility (from rural to urban sectors). Creation of a credit market for investment of Green Revolution profits in small scale enterprises, and improvement of a labor market for entry of farm labor into industries which result, will both be accelerated if farm operations, informal sector businesses, and large scale manufacturing are located with the intent to reduce the friction of space.

This cannot be accomplished by simple placement of small urban centers in the midst of irrigated areas producing rice with Green Revolution technology. It requires a farm population with a post-peasant mentality---a labor force which is not bound to the land by patron-client relationships (Scott 1976), by ritual or belief concerning land as a patrimony (Lewis 1971), or to landlords by debt (Takahashi 1969). Laborers must respond to the profit motive and farm owners must show an interest in entrepreneurship before small enterprises will flourish.

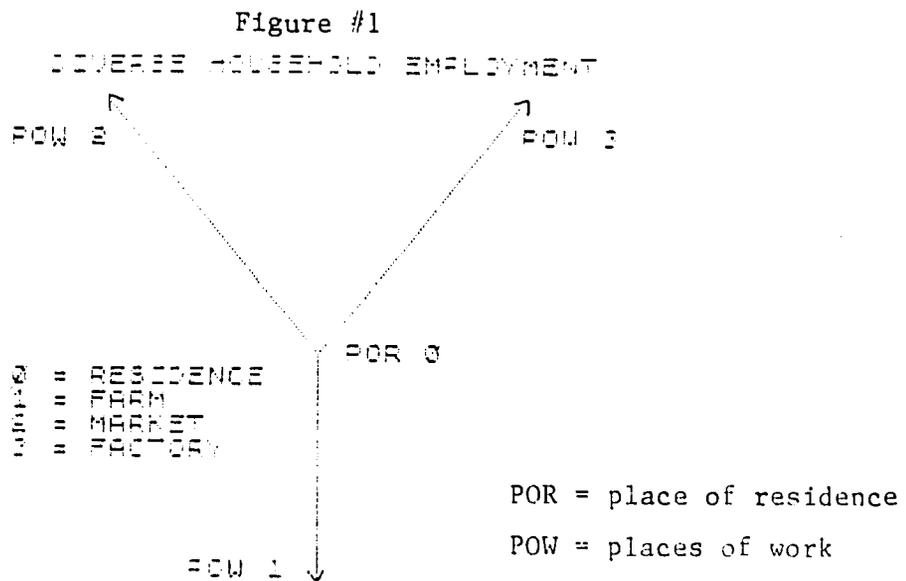
Institutions are essential to generate a hospitable environment for these basic reorientations of peasant attitudes toward employment, investment, and the life style for which they provide. The Green Revolution in agriculture makes its own demands for public investments and institutions (Hackenberg 1980). These include the essentials of infrastructure: roads, irrigation and electrification. But administrative intervention is required to provide for land reform, credit in the form of crop loans, and agricultural extension services.¹

A second stage of intervention is needed to establish the foundation for small enterprise industrialization. As Oshima (1983) demonstrates, secondary level education and family planning services at field level must be made available.

1. Administrative intervention in the Philippines and elsewhere in Southeast Asia has taken the form of a substantial hierarchically organized and centrally directed bureaucracy for each sectoral activity: agriculture, irrigation, education, health, family planning, land reform, local government, etc. While controlled from Manila where policy-making and budgeting take place, regional offices and field level personnel are maintained throughout the country (Gable and Springer 1979).

These second-level institutions are essential to promote receptive attitudes toward economic growth and change; they are also mechanisms for fostering labor mobility, entrepreneurship, and upgrading the quality while limiting the quantity of the labor force.

Multiple employment by individual household members, and a variety of jobs filled in farming, informal sector enterprises, and possible large scale industry by the household labor force will achieve the goals of microubanization. The first part of this discussion leads to the conclusion that, to improve the economic position of the household, a certain relationship between place of residence and places of work must be maintained (see Fig. 1 below). Multiple sources of employment



must be within reach of all members of the household without requiring them to leave it. This is critical because the seasonal nature of both factory and farm work, and markets also, implies that a series of income sources be assembled during the course of the year by the members. The income of the household will be stabilized if multiple workers, each experiencing alternate periods of single occupations, multiple occupations, and unemployment, reside under a single roof.

Since the seed-and-fertilizer revolution has already taken hold in Southern Mindanao and similar resource frontier areas of Southeast Asia, it follows that both infrastructure and core institutions (land reform, credit, extension work)

were in place more than a decade ago. The second level institutions (education, family planning) are more recent but also operating here as elsewhere in the resource frontier zones. To sustain economic growth and improve the economic positions of households in the years beyond the Green Revolution, the elements of a program for small scale industry based on local raw materials, and support services for high technology agriculture must be provided at minimum cost.¹

For reasons which will become clear as the case study unfolds, we do not believe that either growth pole investments, balanced hierarchies of settlements or comprehensive multisectoral strategies are required at this time. The most strongly advocated policy advanced by planners during the 1970s was selective regional closure of "natural economic areas" containing a productive agricultural core (Lo and Salih 1978, Friedmann 1981; Stohr and Taylor 1981; Mathur 1982). Evidence will be introduced to affirm that closure (specifically, the interplay of local capital, labor and land markets with minimum leakage) is already well advanced in one such natural area: the Digos-Padada Valley.

It is true, in a sense, that microubanization makes a virtue of necessity. Hackenberg (1980, 1982) is not the first to argue that it is unlikely that a Berry-type log-normal distribution of urban places will ever appear in many countries of the region (Laquian 1973; Jones 1975; Goldstein 1978). Hackenberg (1982: 167-168) summarized as follows:

"The rapid but parallel growth of both rural and urban population has prevented a significant level of urbanization from being achieved; at the same time, a small number of cities have attained substantial size and complexity of economic structure...a corollary of this is the distortion of the conventional notion of an emergent urban hierarchy. The cities of Southern Mindanao present a perfect example of the problem Richardson (1982) designates as 'size class jumping': as a few cities become large, small and medium cities 'disappear'.... The solution proposed is diffuse urbanization: the distribution of urban services to rural areas from a small number of large cities, relying on modern transportation and communications technology to bypass the need for intervening lower order urban places."

Even the World Bank's Regional Cities Development Program targets its \$67 million on the improvement of facilities for only four major secondary cities of the Philippines; Davao, Bacolod, Iloilo, and Cagayan de Oro; Cebu is the beneficiary of an earlier loan. The consequence will be further size-class jumping at the upper end of the urban distribution, and even greater distortion in the hierarchy as a whole.

1. Child and Kaneda (1975) provide a case study of small-scale irrigation equipment manufacture located in small towns of the Punjab in Pakistan. Farm implement manufacture and repair is another example.

A proposal to extend the growth spurt produced in agriculture by the Green Revolution by superimposing a program of minimum urbanization upon the region containing it is not an attempt to return to bootstrap methods of the community development decade of 1950. To meet the challenge of poverty and population growth we need to do much more than unleash latent social forces. Micro-urbanization is not a substitute for conventional capital intensive approaches to the generating of higher productivity.

On the contrary, it should only be attempted where heavy investment in infrastructure required for the advancement of agriculture has already taken place and where "the sunk costs are in the ground". Furthermore, it requires the full complement of centrally organized institutions, implemented at field level, represented in the Philippines by the Ministry of Agrarian Reform, the Ministry of Agriculture and Natural Resources, the National Irrigation Administration, the Ministry of Human Settlements, the Ministry of Commerce and Industry, the National Power Corporation, the Ministry of Local Government, and the Population Commission.¹ This list includes only those agencies who have field representatives on the ground in the Digos-Padada Valley. There are others which maintain a physical presence at the poblacion level in each municipality of all provinces.

It is precisely because of the rich texture of administrative resources available at farm level that the Green Revolution has succeeded and that the next phase of small industry growth can be initiated cheaply and with high probability of success. It is also because these complex bureaucracies are already in the field that it can be argued with conviction that a mature hierarchy of settlements is not necessary in order to put them there. All the ministries listed above have single coordinating centers in Davao City, with field staffs working directly from the five provincial capitals of the Southern Mindanao region to serve its 3.35 million people (1980).

For these reasons, microunurbanization can be defined as it was first presented: as an optimization strategy rather than a comprehensive investment program. It will utilize existing infrastructure investments by seeking implicit multipliers which will link them to second-generation development opportunities which can be promoted by administrative personnel for whom budgets have already been committed.

-
1. These ministries, in the order named, are responsible for land reform, extension services and crop loans, canal irrigation, pump irrigation, small business enterprises, electric cooperatives, the agricultural producers cooperatives (Samahang Nayon) and the family planning program. The Ministry of Finance and Ministry of Health are also responsible for rural banks and rural health clinics located in each poblacion. There is also, of course, the public school system operated by the Ministry of Education and Culture.

Before offering specific projects to be considered by planners and administrators as examples of the strategy it is absolutely essential to gain some insights into the foundation for further growth provided by the present consequences of the Green Revolution in the Digos-Padada Valley.

It was mentioned in the discussion of minimizing investments (sec. #2 above) that, in lieu of a comprehensive multi-sectoral plan, the administrator must determine what is probable on the basis of (1) present economic trends within the region and (2) alterations to result from sectoral programs already at the implementation stage. The scenario for the immediate future constructed from these components becomes the framework for extracting the implicit multipliers and feedback linkages which generate microubanization.¹

It follows from this that (1) the advances made by seed-and-fertilizer technology in modifying the socioeconomic structure of the Digos-Padada Valley population will have opened a range of opportunities for further growth, and (2) the counterpart of this is that constraints have also appeared concurrently which will reduce or eliminate other opportunities which previously existed.² Finally, a moment's reflection on these points should convince the planner that it is difficult to package a "solution" from one country or region and superimpose it on a number of others presuming that success will necessarily follow. Microubanization as a strategy will need to be redesigned for each area into which it is introduced---hence the emphasis on zonal and regional taxonomy in Tables 1-2 above.

-
1. The planner and administrator seek to remodel the future so that undesirable aspects of the present will disappear. "The ability to do this rests on our capacity to predict the future (1) as it will appear if no special action is taken, and (2) as it may appear if we act to divert it into a more desirable channel" (Hackenberg 1958: 2-3). But the community's future will be substantially different even if no action is taken.
 2. "Unlike plant or animal populations, postindustrial man is no mere occupant of an ecological niche. He either builds his own or remodels the one vacated by the former tenant. A constructed or remodeled environment has a very different composition from one found in nature. Certain 'given' elements have been consumed or removed, while others have been added. Because of the altered potentials for life support, the possibilities for growth have been limited, with some paths of development, or channels, becoming more probable than others. In this fashion, cultural change becomes the study of ecosystemic channels" (Hackenberg 1974: 28).

See also my argument that "...massive social change can take place within a shorter time perspective than that required for the achievement of technological change. For example, community residents may migrate before a development program intended to stabilize their local economy has been completed" (Hackenberg 1976: 304).

B. Sub-Regional Farm Modernization: Prologue to Urbanization in Southern Mindanao

Rice self-sufficiency for each of the major countries of Southeast Asia has been a major economic objective since independence was achieved at mid-century. In the Philippines during the American colonial period, the expansion of irrigation facilities, coupled with the homestead policy which opened frontier areas for pioneer settlement, reduced the substantial imports at the end of the Spanish regime from an amount equal to one-third of the rice produced (1910-1914) to near zero in 1934. War time disruption of agriculture and population growth created a deficiency after independence which grew to 560 thousand metric tons by 1965. The amount of rice imported in that year was equal to 23% of that produced within the country (Golay and Goodstein: 1967: 48-49).

While this deficit could have been removed by continuing trade with Thailand or Vietnam, both countries with predictable annual surpluses, Baker (1981: 345) observes that ideological issues were involved:

"...new policies of economic development often discouraged resumption of old interdependencies. National economies were now being brought under closer regimentation by national governments, and the prevailing ideologies of economic development demanded that countries turn inward rather than outward for supplies of basic resources such as food, labor and other primary materials. These ideologies...looked upon a nation's countryside as a source of supplies for the city."

Rice self-sufficiency (at controlled prices) assured the government of its capacity to feed a politically volatile urban population and thus promote political stability. Furthermore, the uncertainties surrounding the future of several mainland Southeast Asian rice-surplus producers in the 1960's discouraged long-term dependence on trade. The present status of Cambodia and Vietnam indicates that apprehension was well-founded.

The food crisis generated throughout Southeast Asia by explosive population growth since 1950 has been resolved, at least for the present, by the Green Revolution. An increase in rice yields rather than an expansion in basic farming area has been the cause (Ruttan 1978: 374). The Philippines had provided for its expanding population (3.5% annual growth during the 1960s) by bringing new land into cultivation throughout the century. Between 1948 and 1960, more than two million migrants homesteaded tracts in Mindanao for that purpose (Wernstedt and Simkins 1965).

But the outlet made possible by unsubjected farm land has not been available for several decades:

"In the Philippines, the 1960's was the decade of the closing of the land frontier. During the 1950's, 80% of the increase in agricultural output, which grew at the rate of 4.1%, was accounted for by area expansion. In contrast during the 1960's half of the 3.6% annual increase...was accounted for by increase in yield per hectare. Investment in irrigation played a key role in the yield increase" (Ruttan 1978: 374).

By the mid-70's 64% of all irrigated rice fields were planted with high yield varieties (Hayami and Kikuchi 1981: 44).

To accomplish this, nothing short of reorganization of the farm economy was demanded. The new farm system required irrigation, and irrigable area expanded from 739 to 1,607 thousand hectares between 1960 and 1978 (Kikuchi and Hayami 1978: 331-332). But the semi-dwarf varieties of rice seed known as high yield varieties (HYV's) also needed (1) fertilizer; (2) agricultural chemicals; (3) additional labor beyond that of household members; (4) farm machinery; (5) and credit to finance all of the above (Barker and Cordova 1978; Duff 1978; Wickham, Barner and Rosegrant 1978). To deal with the resource allocation, budgeting and scheduling problems implicit in this shift to "high technology farming", a management approach to the farm as a system of production was also required.

For several decades it has been customary to view the shift from traditional peasant cultivation to scientific crop production as containing implicit factor biases favoring the large landholder at the expense of the small cultivator (Myint 1971; Falcon 1970; Scott 1976). In the most recent comprehensive treatment of the subject, Hayami and Kikuchi (1981) forecast two possible outcomes, each of which envisions a substantial and adverse change in income distribution resulting from the Green Revolution.

The first outcome which they describe as polarization depicts a bimodal distribution of income resulting from separation of the traditional farm community into an upper stratum of large commercial farmers and a lower stratum of landless proletarians. The second outcome, which they term stratification, forecasts a continuous subdivision of landholdings and laborers' rights to work diminishing portions of the land as a result of increasing class differentiation. This latter option

will generate a unimodal distribution of household incomes; but these will be tightly clustered around a mean which will steadily diminish as successive generations add new households to the rural labor force.

Hayami and Kikuchi's first option, polarization, visualizes the village shattering as a social and cultural unit under the impact of market forces which take advantage of the scarcity of land (forcing its price upward) and the abundance of labor (forcing its price downward). The second option, stratification, entertains the possibility that village redistributive mechanisms for income sharing remain intact; however, with the passage of time the shares distributed by the stratification system become progressively smaller as in Indonesia (Geertz 1963).

From the viewpoint of the resource frontier in Southern Mindanao, Hackenberg (1984) has proposed a third option with a positive rather than a negative outcome resulting from agricultural modernization which he calls diversification. This option permits the new seed-and-fertilizer technology to be blended on the resource frontier of Mindanao with a settlement pattern shaped by homesteading by small scale farm operators (Pelzer 1945). The land use pattern is thus differentiated from that of the older core areas (Central and Southern Luzon) described by Hayami and Kikuchi (1981) in which estates have been traditional and landlord-tenant relations are ubiquitous.

The convergence of homesteading with the public investment in infrastructure (roads, irrigation and electrification) and institutions (land reform, credit, agricultural extension) described above has created a favorable opportunity structure for migrant households. The consequent is a large stratum of medium-sized, technologically sophisticated owner-operated farmsteads, linked with others to form effective producing and marketing units through cooperatives. Land reform and access to credit prevents the emergence of a class of large landlords who monopolize these factors. Instead, a narrow distribution of similar operating units emerges with credit sufficient to employ additional farm labor required for multiple cropping. This process absorbs labor surpluses at the same time as a final institutional component, family planning services, is reducing reproduction of new labor recruits.

Roberts (1978) argues that a population of medium-sized farm operators represents a substantial demand for agricultural inputs, services and consumer goods.

Local entrepreneurship will respond to this demand, generating rural non-farm employment and expanding service centers. Thus, the modernizing farm economy becomes the trigger mechanism for accelerating lower order urbanization. In turn, the farm economy should be relieved of its mission to find jobs in agriculture for subsequent generations of workers. The evolving and diversifying economy which results should provide a unimodal household income distribution with a constantly rising mean.

To probe the utility of the diversification option, it will be subjected to an empirical test in an ideal environment: the Digos-Padada Valley, an irrigated rice zone founded by migrants to Mindanao in the decades prior to 1965. The valley belongs to a region which was available for homesteading under the Public Land Law of 1903, authorizing households to obtain 16 hectares and plantations to operate up to 1,024 hectares. Little advantage was taken of the opportunity until the Colonization Act of 1935 which created a road network linking all municipalities with each other, with Davao City, and with the sea. Despite this, the population of old Davao province which, until divided in 1967, represented one-fourth of Mindanao, was only 293,000 (Hackenberg 1983: 75-76).

The rush of settlers to this region occurred in the years following independence. Simkins and Wernstedt (1971: 7-9) estimate that there were 118,000 migrants (beyond the rate of natural increase) to the Digos-Padada Valley alone. The speed with which farms were placed in production resulted from the simultaneous expansion of Mindanao's timber industry. By 1963, Davao had the largest number of timber concessions to be found in any Philippine province (Hackenberg and Hackenberg 1971: 7). Since land must be cleared before it can be settled, the advance of rice and corn kept pace with the retreat of the timber line.

By 1960, the valley's population had grown to 186,000 persons, occupying an area served by one of the largest communal irrigation systems in the Philippines: The Badagoy Irrigation Association which currently provides for 4,575 hectares (Hackenberg 1984). These irrigated bottomlands were an ideal environment for HYV's, which were introduced in 1967; the first hand tractors were purchased during the same year (Hackenberg 1971: 22-23). The onset of the Green Revolution was paralleled by a more substantial change in the regional economy: the introduction of agri-business in the form of substantial plantings of banana and sugar after 1965.

Because of its reliance on high technology, Green Revolution agriculture by homesteaders is dependent on the same level of public investment which is a precondition for the entry of multinationals and the establishment of corporate farming. It should not be surprising then to observe that the infrastructure base in Southern Mindanao and agri-business have developed in parallel. Both HYV's and commercial crop production were accompanied by massive government investments in a suitable environment for them: Highways, feeder roads, power distribution and irrigation facilities. All these were financed by development loans from World Bank, Asian Development Bank, and USAID in the late 1960's and early 1970's.

The resource frontier environment of the Digos-Padada Valley in 1970 contained the essentials for a competitive scramble to control the factors of production in which corporations would be pitted against homesteaders. Under these circumstances, either polarization or stratification might appear to be an outcome as probable as diversification. An opportunity to verify the course of development was provided by two field studies of contrasting communities located in the valley, separated by an interval of ten years. The baseline study, conducted in 1970, coincided with dates given by Simkins and Wernstedt (1971) and Ruttan (1978: 374) for the closing of Mindanao as a land frontier, and for future growth of cereal production to depend on yield increases rather than the opening of new farmsteads.

The baseline research project consisted of completed interviews from 2,050 households divided between the municipalities of Magsaysay (the experimental site) and Matanao (the control community). Magsaysay was a village founded by Ilocano migrants, skilled in irrigated rice cultivation and in communal irrigation. It occupied a lowland river-bottom site and was responsible for the inception of the Badagaoy Irrigation Association. As the first village in Davao del Sur to accept miracle rice and hand tractors, Magsaysay deserved its reputation for progressive farming.

Matanao was a hilly upland municipality settled by Cebuano migrants from an area noted for the hacienda system in which planters grow sugar and peasants subsist on meager plantings of corn. The majority of Matanao's homesteaders were given to cultivating three crops of corn per year without benefit of fertilizer or irrigation, a practise guaranteed to rapidly deplete the soil and impoverish the occupants. It was widely known as a conservative community.

Map #1 opposite divides the Philippines into its administrative regions. The core areas studied by Hayami and Kikuchi (1981) are in Regions IV-A (Laguna, #24) and III (Nueva Ecija, #15). The resource frontier, the subject of this discussion, is Region XI (Davao del Sur, #66). Other resource frontier zones of the Philippines are Region II, Cagayan Valley, and the Province of Palawan (#30) in Region IV-A.

Map #2 offers a close-up view of Region XI and the five provinces of which it consists. Davao del Sur, the province in which the Digos-Padada Valley is located, also contains Davao City, the regional capital. Map #3, a detailed view of the Province of Davao del Sur, identifies the two study sites, municipalities of Magsaysay and Matanao. These two municipalities are within the most densely populated (black) zone of the province, the outlines of which define the Digos-Padada Valley.

The baseline study was intended to determine whether in Magsaysay, a modernizing rice-producing community, yield increases and financial prosperity would be instrumental in reducing levels of fertility, as in similar situations in Japan, South Korea and Taiwan. Neither income gains nor fertility declines were expected in Matanao, the control community. Results were mixed: the inter-community comparison within the Digos-Padada Valley disclosed the expected economic differences but only demographic similarities. Fertility in both communities was equal to nationwide norms for the rural Philippines.

A partial explanation was to be found in the incipient nature of the Green Revolution in Magsaysay in 1970. While income opportunities in producing irrigated rice were superior to those available to growers of rain-fed corn, the expected differences in technology, labor consumption and credit requirements had yet to emerge. Rice production in Magsaysay in 1970 was still essentially a family enterprise dependent upon household labor, supplemented at harvest time with assistance from neighboring households. Traditional rice varieties were still cultivated by the majority and yields were at historically determined levels: 40-50 cavans of fifty kilograms each per hectare.

By the time a restudy of the two communities was undertaken in 1980, a number of circumstances had changed. Both public and private investment burgeoned throughout the valley as described above. HYV's were accepted and cultivated throughout Magsaysay; meanwhile, substantial penetration of Matanao by operators of the new

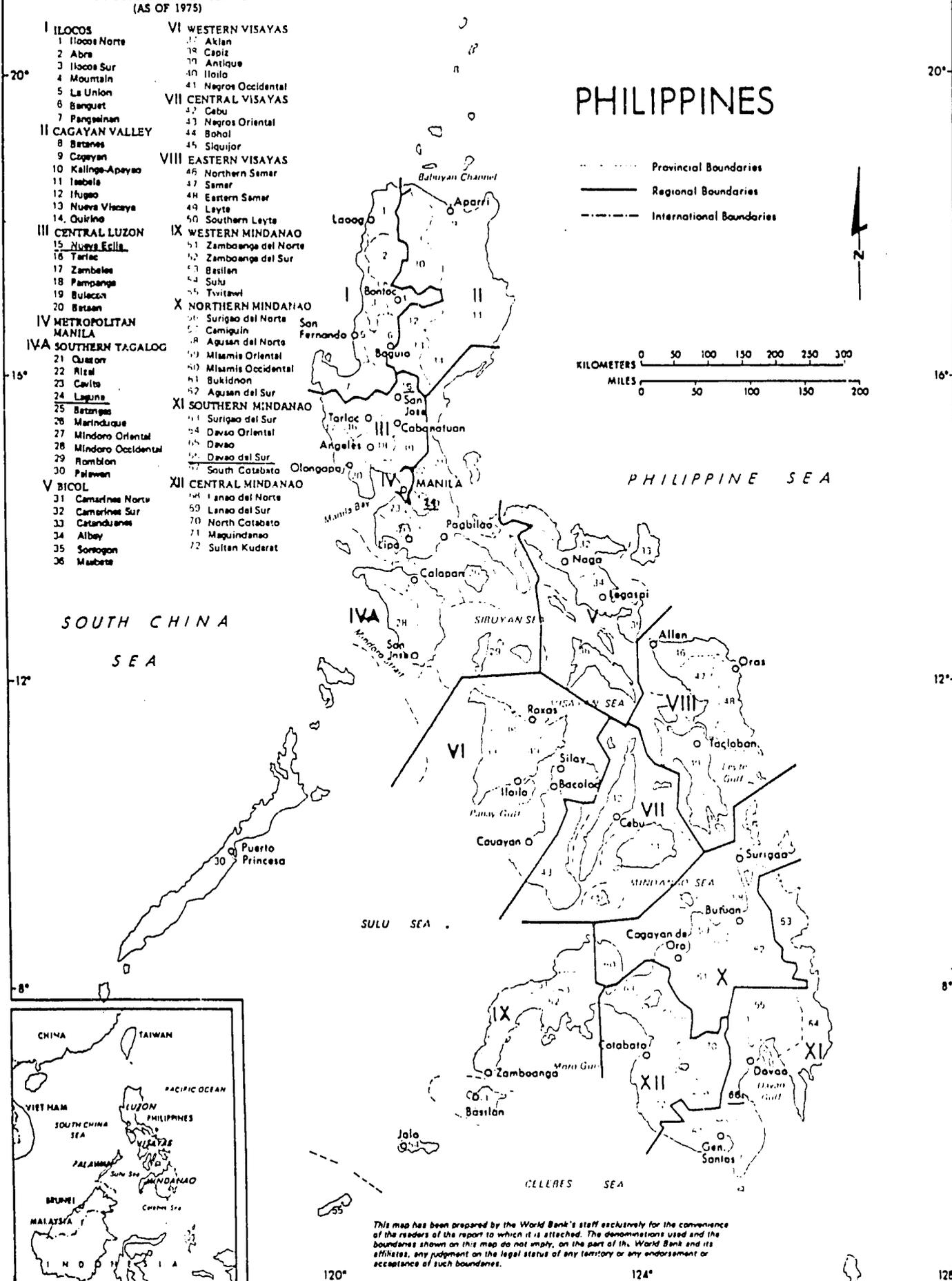
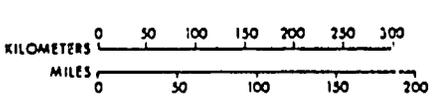
21

116° CLASSIFICATION OF PROVINCES BY GEOGRAPHICAL REGIONS (AS OF 1975)

- | | |
|-------------------------------|-----------------------------|
| I ILOCOS | VI WESTERN VISAYAS |
| 1 Ilocos Norte | 31 Aklan |
| 2 Abra | 32 Capiz |
| 3 Ilocos Sur | 33 Antique |
| 4 Mountain | 34 Iloilo |
| 5 La Union | 35 Negros Occidental |
| 6 Benguet | VII CENTRAL VISAYAS |
| 7 Pangasinan | 36 Cebu |
| II CAGAYAN VALLEY | 37 Negros Oriental |
| 8 Batanes | 38 Bohol |
| 9 Cagayan | 39 Siquijor |
| 10 Kalinga-Apayao | VIII EASTERN VISAYAS |
| 11 Isabela | 40 Northern Samar |
| 12 Ifugao | 41 Samar |
| 13 Nueva Vizcaya | 42 Eastern Samar |
| 14 Quirino | 43 Leyte |
| III CENTRAL LUZON | 44 Southern Leyte |
| 15 Nueva Ecija | IX WESTERN MINDANAO |
| 16 Tarlac | 45 Zamboanga del Norte |
| 17 Zambales | 46 Zamboanga del Sur |
| 18 Pampanga | 47 Basilan |
| 19 Bulacan | 48 Sulu |
| 20 Batangas | 49 Tawi-tawi |
| IV METROPOLITAN MANILA | X NORTHERN MINDANAO |
| IVA SOUTHERN TAGALOG | 50 Surigao del Norte |
| 21 Quezon | 51 Camiguin |
| 22 Rizal | 52 Agusan del Norte |
| 23 Cavite | 53 Misamis Oriental |
| 24 Laguna | 54 Misamis Occidental |
| 25 Batangas | 55 Bukidnon |
| 26 Marikina | 56 Agusan del Sur |
| 27 Mindoro Oriental | XI SOUTHERN MINDANAO |
| 28 Mindoro Occidental | 57 Surigao del Sur |
| 29 Iloilo | 58 Davao Oriental |
| 30 Palawan | 59 Davao |
| V BICOL | 60 Davao del Sur |
| 31 Camarines Norte | 61 South Cotabato |
| 32 Camarines Sur | XII CENTRAL MINDANAO |
| 33 Catanduanes | 62 Lanao del Norte |
| 34 Albay | 63 Lanao del Sur |
| 35 Sorsogon | 64 North Cotabato |
| 36 Masbate | 65 Maguindanao |
| | 66 Sultan Kudarat |

PHILIPPINES

Provincial Boundaries
Regional Boundaries
International Boundaries



This map has been prepared by the World Bank's staff exclusively for the convenience of the readers of the report to which it is attached. The denominations used and the boundaries shown on this map do not imply, on the part of the World Bank and its affiliates, any judgment on the legal status of any territory or any endorsement or acceptance of such boundaries.

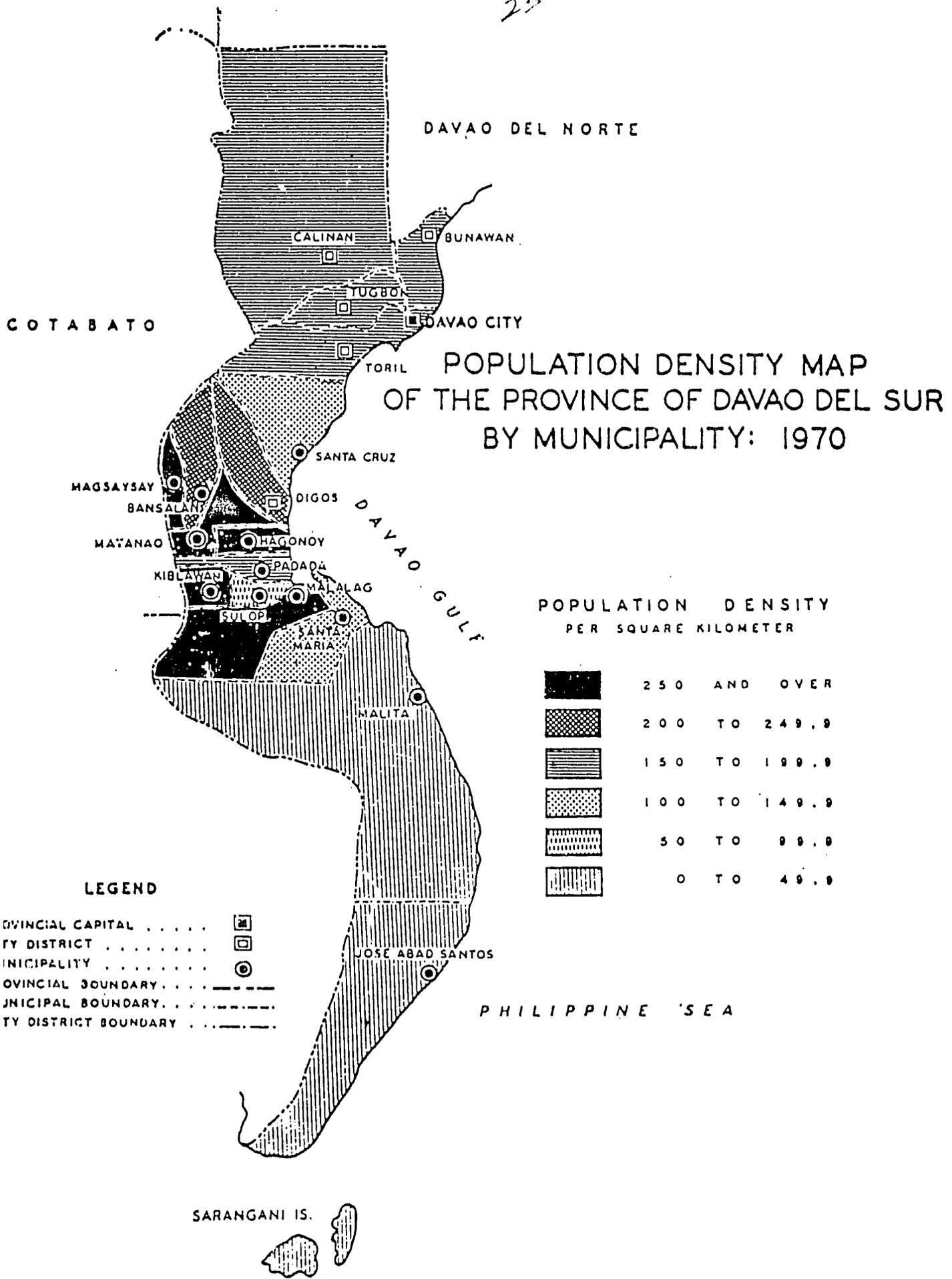
Map of Region XI



Legend:

- REGIONAL BOUNDARY.....
- PROVINCIAL BOUNDARY.....
- PROVINCIAL CAPITAL.....
- CITY.....





sugar refinery near Hagonoy (see Map #3) had also taken place. Many Matanao farms were leased by Davao Sugar Central Corporation which, at the same time, hired the former operators as fulltime labor.

An increase in labor consumption, and a shift from household to hired workers, was also to be expected in Magsaysay on the basis of experience reported by the International Rice Research Institute for the province of Laguna as a consequence of acceptance of HYV's:

"From 1965 to 1975, total pre-harvest labor increased on average from 49.7 to 71.6 person-days per hectare. Family labor declined during the same period from 33.1 to 21.6 person-days per hectare....This hired labor appears to have replaced the family as the primary source of labor in the survey areas" (Roumasset and Smith 1981: 410).

The new crop system was accompanied by a new institutional environment which was also a product of the 1970's. Three major government programs were introduced during the decade. Land reform was imposed on rice and corn cultivators, requiring the transfer of holdings in excess of seven hectares (Harkin 1975; Kerkvliet 1974). Subsidized crop loans were provided to rice producers under the "Masagana 99" program which, like land reform, was initiated in 1973 (Castillo 1973: 183-260). Finally, a nationwide family planning program with free contraceptive services dispensed at the village level became available after 1975 (POPCOM 1978).

Each municipality, Magsaysay and Matanao, consists of an administrative center (municipio or poblacion) which is the smallest urban place in the Philippine settlement hierarchy. Each poblacion is surrounded by rural communities (barrios, renamed barangays after 1972). In 1970, Magsaysay contained 18 barrios with a population of 30,920; Matanao contained 32 barrios with a population of 26,889. For both surveys, coverage included the entire poblacion in each municipality and a selection of rural barrios intended to include a socioeconomic cross-section of agriculture. For analytical purposes, each municipality was divided into three components: a high farm income area, a low farm income area, and the poblacion. The baseline study covered 2,050 households with a population of 11,639.

The 1980 restudy of the two communities in the Digos-Padada Valley was undertaken to determine which of the three outcomes discussed to this point---polarization, stratification or diversification---apply to the Digos-Padada Valley settlements in the wake of the massive interventions which took place following the completion of

the baseline survey. The results below have been selected to illustrate three interdependent and overarching sets of conclusions concerning the impact of the Green Revolution years since 1970 on the communities of the Valley:

1. Attainment of the high rice yields demanded for self-sufficiency required total replacement of the peasant mode of production by the capitalist mode of production.
2. This resulted in the exchange of a locally based and largely autonomous economic system for integration into the wider regional economy.
3. It also generated the exchange of a locally based demographic system for integration into, and exchange with, the broader regional population system.

In the three sections to follow, each of these points will be developed with data selected from the mass of evidence compiled during the two surveys (Hackenberg 1975, 1984). To avoid interrupting the flow of discussion and descent into detail, documentation has been confined to Appendix Tables; only summaries will be presented within the body of the text.

1. Replacement of the peasant by the capitalist mode of production.

Most discussions framed in these terms have chosen to make ideological points or raise theoretical issues (McGee 1980). In so doing, and perhaps for lack of adequate case studies, they lose track of a critical empirical premise: the form of capitalism being introduced as part of Green Revolution technology bears little relationship to the exploitative, imperialist variety.

To facilitate reaching its goal of rice self-sufficiency, the government agencies responsible for reaching that goal lavished a cornucopia of benefits on the smallholder. Price supports were introduced. The supply of fertilizer was regulated and distributed at a controlled price. Government storehouses were constructed at which the support prices were paid. Technicians prepared production schedules indicating the times for application of inputs and the dates for performance of all operations; these same technicians determined the farmer's credit requirements and provided him with a crop loan (Castillo 1983; World Bank 1976: 160-162)

The commercialization of rice production involved total capitalist penetration of an area which had previously featured peasant production goals and methods. But it was a painless and detoxified form of capitalism from which all risks had been removed; more precisely, the risks which should have been incurred by the farmer were transferred to the government itself. For example, in a crop failure situation a peasant who had incurred substantial indebtedness for a "Masagana 99" loan merely

defaulted; since the loan was not collateralized, he lost nothing. The government as the source of this unrepaid loan became more deeply obligated to its creditors who were the ultimate source of financing (World Bank, Asian Development Bank, etc.)¹

Rice yields in the Digos-Padada Valley rapidly rose from 40-50 cavans per hectare to an average of 80 to 100 cavans. Since prices were adjusted to reflect the continuous depreciation in the currency (World Bank 1980: 82), profits were guaranteed. Nationwide rice self-sufficiency was achieved in 1975 (IRRI 1978: 338), and the Digos-Padada Valley made its contribution. While profits were substantial, other consequences were more significant. Middle-aged farm operators, raised in a tradition of risk-aversion to minimize losses, were switching to a profit-seeking economic liberalism.

Rice production which had previously determined both economic and social relations within the community, including ritual events and the seasonal calendar, was now demoted to the status of one of a number of possible income sources to be derived from farm land. Needless to say, the farmers were quite aware of the balloon ascension in land prices which was taking place beneath their feet and converting peasants to capitalists interested in "asset management" and "investment strategies".²

An interdependent series of changes which entered the life of the valley communities may be summarized by the recognition that a new fluidity had penetrated aspects of life which were once considered immutable. In the continuing search for higher income, mobility became an essential characteristic of all factors of production

1. The "Masagana 99" program has generated fresh controversy at a speed at least equal to its impact on rice production. Castillo(1983: 183-254) offers the most complete description and assessment. The World Bank (1983) Agricultural Credit Sector Review, which took an alarmist position on the consequences of the program's collapse, will be discussed below.
2. One of the founders of Magsaysay, an Ilocano from Zambales, farmed five hectares of rice successfully through the 1960s, saw his wife elected to the municipal council, and educated his four children, two of whom departed for employment in Davao City as laboratory technicians. During these years he continually expressed his contempt for his brother who had moved from his rice farm to the poblacion where he built a Western style house, purchased a piano, "...and lived like a businessman." He had nothing but ridicule for those "businessmen" who traded in the poblacion. By 1975, after three years of rice-produced affluence, he also moved to the poblacion, built a Western style house (with electrification), turned his farm over to his son and a tenant, and opened a restaurant. He may be seen at a front table on most days meeting with others who have joined him in a sugar speculation in an upland barrio outside the valley. He is now a businessman.

and, in Ben-Porath's (1980) terms, an acceptable "transaction cost". Opportunities for income improvement became a sufficient justification for change of residence, sale of land, dismissal of tenants or laborers, and the entry into another occupation or enterprise. Myint (1970) predicted that farm modernization would result in "dis-equalization" among a population which remained localized and tied to the land. In the Digos-Padada Valley, it appears to be "dislocalization" which has taken place among member households of communities viewing farm modernization as a platform providing access to a range of higher positions in the broader regional economy.¹

2. Economic integration into the wider regional trade network.

DeKoninck (1979: 266), interpreting two field studies of the impact of high technology rice production in Malaysia (Kedah) and Indonesia (Aceh), concludes that "...the green revolution remains the ideal way to attempt rapid integration of the entire peasant community into both the national and international frameworks, socially and economically. Such integration implies a submission to the market economy of the essentially pre-capitalist units of production that peasant households represent."

There are two ways to interpret the integration which results. DeKoninck chooses to make the dependencia argument that connecting rural resources with urban capitalism will generate backwash effects which will be fatal to the countryside. This will occur because urban elites control both investment capital and technology required to exploit these resources effectively. The monopoly of skills associated with this technology is found in the city, which will give further advantages to the urban labor force at the expense of unskilled rural labor which is already in oversupply.

But there is an alternative argued by Higgins (1979) from the perspective of technological dualism. Since a monopoly of technology by urban elites explains the rural-urban dichotomy in previous development, then the equalization of technology between the two sectors provides the solution. This requires a "big push" which will simultaneously (1) finance increased agricultural productivity by smallholders; (2) provide them with the technology needed to improve output; and (3) educate farm

1. It may be the heritage of Redfield's Little Community and Peasant Society and Culture (1965) but the notion persists that the object of development is a finite population existing on a limited resource base. While both village populations and resources may be bounded units (at least for analytical purposes), the boundaries are membranes which have always been permeable in both directions. Hackenberg (1972) argued that villagers frequently seek to employ a centrifugal adaptive strategy of exploiting external resources (land, jobs, services). It is the development agency which frequently reverses this, requiring a centripetal strategy of total dependence on a limited resource base.

operators to the skill levels needed to manage these inputs effectively. The Green Revolution in Davao del Sur appears to have incorporated and transferred all of these components and more to the Digos-Padada Valley. It was indeed a big push.¹

Against this background of theoretical issues in development planning which may be illuminated by the analysis of the data sets from Magsaysay and Matanao a set of variables will be examined which includes (1) land ownership and land transfers; (2) crop production and farm operation; (3) employment and labor force participation; (4) income growth and distribution. The ten-year trends in these variables will support the conclusion that the economy of the communities has become integrated into that of the region.

A. Land ownership.

The complex of changes which took place with breathtaking speed after 1970 (see Table 3) left its mark on every dimension of land ownership and utilization. In the baseline year, the number of farms and the number of resident households were approximately in balance in both municipalities---there were equal numbers of both. During the subsequent ten years, households declined slightly by 15%, but farms operated by residents dropped steeply by 40%. The farm area controlled by resident households in each community was further diminished by a shrinkage in

-
1. Much of the pessimistic prognosis for the consequences of the seed-and-fertilizer revolution (Lipton 1976; McGee 1978, 1979, 1980) proceeds from the assumption that rural and urban labor, capital, technology and resources are fragmented, i.e., discontinuous or disconnected. Thus, the urban investor can buy land in the village but not the reverse. The urban worker can take advantage of suitable employment in the countryside but not the reverse. It follows that the surplus rural worker, unable to find a place in agriculture and denied entry into the urban labor market, takes refuge in the informal sector.

Thus, the informal sector becomes, by definition, an inferior component of the economy. It is one more fragmented market utilizing rural-to-urban migrants and traditional forms of production and exchange within the city. By this reasoning, the existence of the informal sector is evidence of labor market fragmentation (Hackenberg 1980). It is consistent with the views of Todaro (1976) and Fields (1975).

Evidence of movement of labor, capital and control of resources and enterprises in both directions---from city to village and village to city---would destroy the fragmentation argument. In fact, Hackenberg (1974) has argued for a decade that blue collar formal sector employment in Davao City is inferior to work in the informal sector and that the direction of upward social mobility is from formal to informal sector (buy and sell business, vending, peddling and market stall operation).

the average size of remaining owner-operated farms by more than 40%. In terms of area, the number of hectares controlled by resident land owners in the two municipalities dropped from 4,931 in 1970 to 2,706 in 1980, or 45% of the base figure. In parallel with this trend, the area operated by tenants and leaseholders diminished from 1,764 hectares in 1970 to 948 hectares in 1980, or 54% of the base figure.

In Magsaysay, the rice-producing municipality, 24% of the farm owner-operators of 1970 left the community during the following decade. The diminished size of the residual land base indicates that they retained ownership while changing residence. In Matanao, the corn-producing municipality, almost all (99%) of the farm owner-operators of 1970 remained in the community through the following decade. The diminished size of the land base shows that they transferred ownership while retaining residence. The beneficiaries of that transfer were absentee sugar-producers, including the company (DASUCECO) operating the refinery.

In Magsaysay, a number of former residents became absentee owners. In Matanao, a number of non-residents became absentee owners. Former residents have obtained the opportunity to invest profits from rice production in Magsaysay more broadly across the region. Non-residents have channeled profits from regional enterprises into the purchase of a share of the resource base in Matanao. From the perspective of commerce in land, the basic resource, both communities are bounded by membranes permeable in both directions.

The situation regarding tenant-operated farms is less complex. Over the decade the number of tenant/leaseholders dropped from 924 to 498, a loss of 46%. A small proportion of the 426 former tenants (12%) became farm laborers. The remainder either left agriculture, or left the community, or both. There was a substantial gain in the number of farm laborer households (138) but three-fifths of these (62%) were in-migrants to the Valley. While some portion of the transformation in land tenure since 1970 can be attributed to the land reform program, it failed in its two self-proclaimed goals: to create more resident owner-operators of small farms and to secure titles for former tenants and leaseholders.

At a glance, the outcome of market forces on land tenure in the Digos-Padada Valley might appear to represent a giant land auction followed by displacement of former occupants. The view producing that perception is distorted. In terms of man/land ratios in 1970, .53 hectares in Magsaysay and .58 hectares in Matanao were being farmed for each resident. By 1980, these figures had dropped to .31 and .43.

The reduction in land available for support of resident households was much more precipitous than the slight drop in household population. The result was a sharply rising density which proved to be a consequence of prosperity rather than impoverishment (as will be documented in sections "C" and "D" below).

B. Crop production and farm operation.

A closer, and even more sharply contrasting, look at the impact of farm modernization on those who depend on agriculture for their subsistence is presented in Table 4, which enumerates all farm workers rather than household heads alone. Once again, the "owner" group proves its capacity to maintain itself. The greater reliance of Matanao on tenants in 1970 becomes evident, as does their more complete removal by 1980. Likewise, it is Matanao which manifests the greater capacity for accommodating farm labor in place of former tenant/leasehold residents in 1980. It is worth repeating that farm labor became fully one-half of a sharply expanded agricultural work force in Matanao, but remained much less than that in Magsaysay where the number of persons performing farm work was stable over the decade. A final point: in both municipalities, the largest proportion of farm laborers and smallest proportion of tenants and leaseholders will be found in the poblaciones. These changes are associated with new cropping patterns described next.

Farm operators raising commercial crops (coconut, sugar, banana, coffee, rubber and cacao) were exempt from land reform, which was only applied to rice and corn cultivators. Rice growers were favored over corn producers in their ability to obtain low interest, uncollateralized government loans. The consequences of these "institutional redefinitions" of the farm operator's environment are apparent in Table 5 which compares cropping patterns of 1970 with those a decade earlier.

There was a radical change in Matanao's cropping pattern. Two-thirds of its farm operators grew corn exclusively in 1970; by 1980 this portion had dropped to one-third. The difference was made up by a shift to either sugar (8%) or coconut (8%), or to a mixed cropping pattern dividing hectarage between a cereal crop (rice or corn) and a commercial crop (coconut or sugar). Mixed cropping of this type was favored by another 15% of former corn cultivators. The remaining one-third of Matanao's farms remained in rice cultivation or shifted to new cash crops (the "Other" category). Sharp divergences in patterns of change between districts cannot be ignored. Sugar was the choice of the low farm income district because it was adjacent

to the Davao Sugar Central Corporation property. The high farm income district exchanged corn for rice because a private irrigation system was constructed after 1970; farms beyond its reach were converted to coconut. Corn cultivation continued to be a factor only in the low income farm area, where it remained to symbolize the poverty of half the farm operators.

By contrast, the cropping pattern in Magsaysay remained the same overall: more than 80% of the farms grew rice in both 1970 and 1980. In fact, corn hectareage was reduced in the low farm income district so that rice could be planted. Only in the poblacion was rice planting curtailed in order to expand coconut production. In 1970, proprietors of farms in both poblaciones had the largest average size holdings in rice and corn (7.8 hectares in Magsaysay and 10.7 in Matanao). Since they stood to lose the most from land reform, they tended to make the largest commitment to cash crops which were exempt: sugar, coconut and specialty crops such as cacao, rubber and fruit trees.

Also, crop diversification broadened the base of agriculture beyond its traditional subsistence role. Cultivation of commercial raw materials such as coconut, rubber and sugar links the Digos-Padada Valley directly with world markets and monetizes all phases of farm operations. Since the scale of production was kept small by land reform, these new "commodity traders" are yesterday's rice and corn peasants. The type of diversification utilized by the small landholders in both municipalities is also of interest.

In 1970, only 9% of the farms in each municipality allocated some part of their areas to non-cereal (commercial) crop production. By 1980, this proportion increased to 16% in Magsaysay and 30% in Matanao. In both municipalities in 1980, the majority of farmers moving away from total commitment to rice or corn chose a mixed cropping pattern: 13% of Magsaysay farms and 18% of Matanao farms were growing either (1) several different commercial crops, or (2) a cereal and a commercial crop at the same time. The advantages of risk-spreading strategies as a hedge against fluctuations in world commodities markets had already been learned.

The rapid decline of the tenant/leaseholder class removed the category of cultivator most likely to suffer from alienability of farm land and commercialization of crop production. Under land reform, the tenant can retain his portion of the farm by payment of a predetermined sum for a fixed period to the landlord, after which he becomes the owner. However, both lessors and tenants must pay the

entire cost of farm operations which was formerly shared with the landlord. In other words, the former tenant is now at risk for crop loss and for indebtedness to the suppliers of inputs. Furthermore, he is thrust into this unfamiliar role during the same decade in which pressure is being exerted upon him to shift to HYV's and become a high technology farmer.

The tenant was traditionally rooted to a particular piece of land, to the cultivation of which he contributed his own labor and that of his household. The labor schedule for the application of inputs in the multiple-cropping of HYV's is neither flexible enough for, nor easily synchronized with, the use of household members. Furthermore, the increasing labor requirement is beyond the capacity of the household to provide. Since he controls no capital assets and is poorly educated, the former tenant is ill-suited for urban migration; he cannot open a business or practise a skill. His best chance is to resettle in the poblacion and offer his services as a laborer to individual farm-operators who will repay him with a crop-share, or to a contractor who will pay him wages. The proof that many former tenant households have done this is contained in the discussion of Tables 3 and 4 above. The poblaciones have been their most likely choice for relocation.

The advancement of former tenants to more competitive positions within the new environment of farm systems seems to require investment in human capital, or social overhead capital (SOC) in Hansen's (1982) terms. However, diversification of crop production, higher yields resulting from HYV's, commerce in inputs and processing of commercial crops have generated substantial opportunities in non-farm employment. Former tenants, and other categories of farm workers as well, can share in this range of opportunities by accepting second jobs outside agriculture.

In the 1980 survey, persons holding positions in agriculture were queried concerning the possibility that they were holders of multiple occupations. The answers from 27% of farm workers in Massaysay, and 34% of farm workers in Matanao was affirmative. The proportion in each municipality was constant for both poblacion and farm districts alike. The implication is that the level of commercialization and employment opportunity has diffused throughout the Digos-Padada Valley.

C. Employment and labor force participation.

The expansion of the labor force in the decade since 1970 has matched agricultural productivity for growth rate. Levels of employment per household are

compared in Table 6. Where 1.4 persons per household were employed in Magsaysay in 1970, the 1980 figure is 2.2; for Matanao the comparable figures are 1.3 and 2.2. These differences represent an increase of 50% of the 1970 base in Magsaysay and 67% in Matanao.

The previously neglected manpower resource was womanpower, primarily the unemployed spouse. The note at the bottom of Table 6 reports that in 1970 less than one-fourth of the households reported a woman employed. By 1980, more than nine-tenths of the households were being partially supported by a woman. The increased income being shared among households throughout the Valley in 1980 represented a much higher rate of labor force participation.

A distribution of major occupational categories has been provided for each survey date (Table 7). Over the ten-year interval working men retained their commitment to on-farm agriculture which provided jobs for 70-80% of their numbers. White collar employment (sales and clerical/professional) seems to have gained slightly against blue collar employment (crafts) in Magsaysay, but not in Matanao.

But the basic changes in the occupational distributions are to be found among women. In 1970, working women were few in number and heavily concentrated in traditional jobs: sales, clerical work and teaching. In 1980, they were reported in substantial numbers in two new categories: farm labor and agricultural nonfarm. In both Magsaysay and Matanao in 1980, women were working in labor gangs as members of contractors' crews for weeding, spraying, harvesting and threshing. The partial mechanization of these tasks facilitated womens' participation in all but the heaviest work.

"Agricultural non-farm" refers to businesses which are conducted by women on farms which do not pertain to raising crops. Operation of poultry-piggery enterprises and production of market vegetables are favorites. The third category in which women increased their numbers is "Sales", which contains those activities usually subsumed within the "informal sector" (Hackenberg 1980: 396-401, 412-415). This category contains traditional sari-sari store keeping,¹ together with all other vending and peddling activities.

Beverly Hackenberg (1979) tested the hypothesis that improvement of infrastructure (roads, electrification and irrigation) together with farm modernization will have a direct impact on (1) proportion of women in modern occupations and (2) level of compensation received. Her study contrasted a set of villages

1. See footnote on pg. 34.

in a high development area of Davao del Sur with a matching low development area in Davao del Norte. Partial results are summarized in her Table "D", presented below:

SPOUSES' INCOMES BY JOB CLASS AND AREA: Working Women
(Means in Pesos)

<u>Job Class</u>	Experimental Area DAVAO DEL SUR		Control Area DAVAO DEL NORTE	
	<u>Women by Job Class</u>	<u>Women's Income</u>	<u>Women by Job Class</u>	<u>Women's Income</u>
Traditional: (Related to Agriculture)	41.4%	₱ 70.31	79.9%	₱ 58.66
Bazaar: (Native Commerce)	36.8	287.60	16.1	117.25
Modern (Formal Sector)	20.8	602.33	4.0	305.82

These data demonstrate conclusively that infrastructure improvement (1) increases the proportion of women with access to informal sector (Bazaar) and formal sector employment and (2) improves their earnings in either of these two latter occupational categories. During the decade in Davao del Sur, commerce in both populaciones expanded from weekly (periodic) to daily (continuous) market activities. Both the volume of sales and variety of stall goods expanded proportionately, as Beverly Hackenberg's study would predict. The resulting explosion of informal sector sales employment for women (Table 7) was the immediate response to this, and to related infrastructure improvements.

Three major employment changes swept the Digos-Padada Valley during the decade. First, there was an absolute increase in the size of the labor force despite a decline in the number of households, explained by the sharply increased number of workers per household. Second, there was a basic change in the composition of this expanded work force, from 15% female in 1970 to 42% female in 1980. Third, there was an important differentiation between the two municipalities with reference to the allocation of workers.

In Magsaysay, despite the shift to labor-consumptive HYV's, the number of total farm workers in 1980 was about the same (1125) as in 1970 (1085). However,

1. Sari-sari or convenience stores are present in a ratio of 1:10 to 1:25 houses throughout the Philippines. They deal in cigarettes, soft drinks, matches, cooking oil, patent medicines and packaged foods.

the percentage of workers on farms dropped from 72% to 54% because of employment growth. In Matanao, where the intrusion of commercial crops was the major change, the number of farm workers sharply increased between 1970 (722) and 1980 (969). However, the percentage of the labor force in farm work remained about the same in 1980 (55.1) as it had been in 1970 (58.3).

Where Magsaysay diverted its additional workers into diversified activities other than farming, Matanao channeled the major portion of its new employees into farm work. But despite its more conservative allocation of employed persons, it should be remembered that Matanao, occupying a less favored environment and starting from a position much deeper in poverty, substantially improved its income position over the decade on the basis of the new employment it could generate.

A final and extremely important dimension of economic integration into the economy of the region is the volume and trend in business activity. The number and variety of business enterprises initiated between 1970 and 1980 has proven to be a critical variable for differentiating the growth patterns of the two communities:

NUMBER AND CATEGORY OF ENTERPRISES, 1970-1980

	Magsaysay		Matanao	
	1970	1980	1970	1980
Rice/corn mills	5	9	0	4
Sari-sari stores	30	67	40	49
General Merchandise	4	23	19	10
Carenderias	5	12	5	10
Farm equipment rental	0	22	0	5
Repair shops	3	5	5	3
Tailor shops	#	8	+	3
Other shops	3	2	3	3
TOTALS	50	148	72	87

There were 48 persons employed as tailor/dressmakers in 1970. Most of them worked at home. By 1980 the number was reduced to 13.

+ There were 49 persons employed as tailor/dressmakers in 1970; again, mostly working at home. By 1980 the number was reduced to 25.

The spurt in small business activity in Magsaysay was not confined to the Poblacion in 1980 as it had been a decade earlier. Almost all farm equipment rental, half the sari-sari stores and a proportion of general merchandise stores were now in the farm communities themselves. A majority of rice and corn mills were in the high farm district as well.

The tripling and dispersal of enterprises in Magsaysay was unmatched in Matanao. Moderate expansion of 20% took place during the decade. Moreover, almost all business activity except for farm machine rental remained in the Poblacion. In Matanao in 1980, one out of five businesses in operation had been started by an in-migrant household which had resided elsewhere in 1970. In Magsaysay, with a business growth of 300%, only 15% of the enterprises were operated by new arrival households. This proportion documents previous assertions that the brisk market in farm land provided many original pioneer households with the capital to invest in new business activities.

An interesting example of the qualitative change in the nature of trade is the case of tailor/dressmakers. In 1970 they were the most numerous category of artisans to be found in either community because almost all clothing except for socks and undergarments was handmade. By 1980 the number was sharply reduced by the store trade in ready-to-wear clothing manufactured in Manila. The example calls attention, once again, to the bi-directional nature of exchanges between the community and its regional environment. Local savings are invested in inventories of goods originating elsewhere in (and outside of) the region.

D. Income growth and distribution.

The question, "Who benefits from modernization?" has been asked with increasing frequency in recent years, and most often with reference to agricultural regions because of the presumption planted by Griffin (1974), Pearse (1975) and others that large landowners will always profit at the expense of other participants. To answer the question without prejudice, we must give equal attention to how much additional income has been generated by farm modernization, and to how it has been distributed. In the wake of the many recent discussions of the equity issue in development (Hackenberg 1977) growth without redistribution is unjustifiable (Chenery 1974).

Household income data related to the question of growth appear in Table 6 opposite. The comparison of figures for municipalities and districts cannot be accomplished without adjustment since (1) the 1970 data are presented as annual figures and the 1980 data are for a single month, and (2) a very substantial amount of inflation has intervened between the baseline year and the date of the restudy. The direct comparison of figures in Table 8 may be accomplished by adjusting the latter (1980) data set as follows: multiply each mean by 12 to generate an annual figure and again by .25 to reflect inflation. The comparison of means and medians for both years, after this adjustment, is as follows:

1970-1980 Household Income: Adjusted Means and Medians¹

	1970		1980	
	<u>Median</u>	<u>Mean</u>	<u>Median</u>	<u>Mean</u>
Magsaysay				
Low Farm Income	748	1353	2820	4338
High Farm Income	1143	1904	3858	5610
Poblacion	1137	1891	2823	4677
Total	948	1711	3141	4863
Matanao				
Low Farm Income	320	528	1596	3069
High Farm Income	696	1159	2172	3663
Poblacion	952	2059	2139	3678
Total	712	1506	2025	3543

1. Data from Table 8.

Direct comparisons of income from the two survey years suffer from the usual uncertainties. Household figures have been carefully constructed from interview data on crop sales, wages, business operations and rentals. Distortion originates in both agriculture and business operations where net earnings would be a better indicator of income. Consequences of the Green Revolution have introduced other issues: (1) much more of the farm economy is monetized in 1980 than was true in 1970; (2) multiple income sources and multiple wage earners in households are much more prevalent, tending to inflate cash income receipts as home production diminishes and disappears.

Nonetheless, the adjusted medians support the conclusion that household income has improved by a factor of 3.3 in Magsaysay and 2.8 in Matanao. However, all four farming districts in both municipalities posted median income gains in 1980 which were more than three times greater than 1970 figures. Income distance between districts within each municipality has tended to converge over the decade whether measured by means or medians.

Each mean for both 1970 and 1980 is accompanied by two measures of dispersion: the standard deviation and the coefficient of variation (which gives the standard deviation as a percent of the mean). Coefficients of variation (symbolized by "V") may be directly compared without adjustment (Blalock 1972: 88). Low

values of V indicate homogeneity; high values of V indicate greater heterogeneity or inequity in the income distributions (see figures in Table 3).

Incomes in Magsaysay in 1970 were more homogeneous than in Matanao and by 1980 these differences were accentuated: Magsaysay became more homogeneous and Matanao less so. The greatest increase in "disequalization" (Myint 1971) is to be found in the farm districts of Matanao between 1970-1980. Conversely, the greatest degree of equity appears in the farm districts of Magsaysay. Viewed from the perspective established in the preceding sections, we may say that the advancement of rice cultivation and mixed farming in Magsaysay promoted higher growth and better distribution. The advancement of reliance on commercial crops (especially coconut and sugar) together with retention of substantial corn hectareage in Matanao promoted substantial growth but poorer distribution.

Without wading deeper into the sea of data, the outlines of change since the baseline study appear to be clear: absolute income growth took place in all districts of both municipalities since 1970. But income distribution becomes more homogeneous in Magsaysay and more heterogeneous in Matanao. Magsaysay achieved growth with equity; Matanao attained growth with "disequalization". Supporting evidence is contained in Table 9 which provides the 1980 distributions. A glance at the "Totals" column for each municipality discloses a sharp contrast: for Magsaysay, the modal values in the distribution are found in the middle third of the cases (above ₱750 per month), but for Matanao they appear in the lowest third of the cases (below ₱600 per month).

Some erosion of the superior position of the poblaciones in 1970 has taken place during the decade. In the baseline year, Magsaysay's urban center had an income mean equal to that of its high farm district but, by 1980, it had fallen far behind. In 1970 the Matanao poblacion held a commanding income position over its rural farm districts; by 1980, it had fallen to a position of equality with the more affluent of its two rural companion districts. The explanation (see Table 4) is to be found in the unprecedented increase in resident farm laborer households which took place in both poblaciones since the baseline survey. This change, represented by an addition of the poor and a decline in prominence of wealthy landlords, is also reflected in a slight increase in coefficients of variation, indicating an increase in heterogeneity within each urban center.

Despite differences in patterns of distribution, households in both municipalities have benefited financially from agricultural modernization. This process has advanced in both communities despite the incursion of corporate agriculture and acceptance of high technology rice production. Gains have been made despite the conversion of many tenant households to laborer status and the reduction in size of farm operating units.

Evidence on living standard improvement is contained in Table 10 concerning use of electricity and possession of appliances. In 1970, electrification was confined to a few households in each poblacion who provided for their needs with gasoline-powered generators. By 1980, more than two-fifths of each poblacion and almost one-fifth of the households in each high income farm district had electricity. Occupants of low income farm districts remained at a disadvantage. Roughly the same proportions hold also for appliance ownership. These figures are comparable to those provided by Roumasset and Smith (1981: 414) for a Laguna community located only 45 minutes by bus from Manila.

The foregoing review of economic trend data from the 1970-1980 interval confirmed that the local communities of the Digos-Padada Valley no longer represent fragmented capital, land and labor markets. Savings generated within the community are stimulating local enterprise and promoting differentiation within the Valley's economy; investment from "outside" has a complementary and convergent effect. The redefinition of farm land as a factor in production, rather than a sacred heritage, has made possible rapid response to changing market conditions for commodities other than rice, and systems of production other than household farm management, e.g. absentee ownership combined with hired administrators and rented equipment.

The appearance of multiple occupations combining farming and business or artisanal activity is a new dimension of labor market activity; so also is the explosive growth of the informal sector and the labor force participation of women. An interdependent factor in the integration of the Valley into the regional economy is the physical mobility of the farm population. As will be described in the next section, it is the willingness of persons of the age to form new households to seek opportunities elsewhere which has decongested the local resource base and prevented economic gains from being swamped by a sedentary and expanding population.

The evidence reviewed in this section should be sufficient to disprove the notion that any type of dualism, technological or otherwise, persists in Davao del

Sur. Furthermore, the substantial demonstration of the improvement in household income throughout the Valley resolves the issue of polarization or stratification as possible outcomes of development. Neither of these paths toward impoverishment has resulted from the Green Revolution in Southern Mindanao. On the other hand, the evidence introduced for diversification as an alternative with a positive outcome has been a uniform consequence of "delocalization".

3. Demographic integration into the regional population system,

In demographic terms, the Digos-Padada Valley also engages in beneficial exchange with its regional environment. The sections to follow describe (1) population structure and its changing composition; (2) migration and the retention of demographic balance with the environment; (3) fertility dynamics and the declining rate of reproduction; (4) education and the improvement of human capital over the decade. As with the previous discussion of economic integration, these trends all contribute to the disproof of notions of fragmentation and dualism and support the concepts of diversification and participation in the wider system.

A. Population structure and its changing composition.

Between 1970 and 1980, the population of the province of Davao del Sur grew at the (explosive) annual rate of 4.4% --- fast enough to double in size every 16 years. However, as Table 11 confirms, the two municipalities in the Digos-Padada Valley produced a counter-trend: over the decade both municipalities lost population at an average annual rate of 1.75%. The net loss was greater in Matanao (20%) than in Magsaysay (15%). A complex of demographic and economic factors is involved in this reversal of the provincial trend.

The Valley was one of the last areas in the province to be settled. Since a migrant population is a younger cohort of recently married persons, its early years of residence tend to be peak fertility years. Such populations will show a rapidly advancing median age and a tendency for growth to decline as married women enter their fourth decade of life. Because a large number of children are born to migrating women during the first few years after their arrival, something like a "baby boom" effect takes place: a large number of young people tend to reach maturity and seek jobs at the same time. It would be appropriate for some proportion of them to migrate elsewhere, most likely to an urban destination.

The rapid aging of the Valley's population, from a median age of less than 15 to more than 17 years, is confirmed by data in Table 11. The sharp drop in the

proportion of children under 10 was responsible for this. However, the changing age distribution will not explain the decline in absolute numbers. Comparison of census survival ratios from the two communities with national data for 1970-1980 provides the explanation.

When age groups between 0 and 39 in 1970 are compared with groups between the ages of 10 and 49 in 1980, we find that survival ratios for the Valley are substantially lower than national norms for the decade. We may safely infer that there has been substantial out-migration from both municipalities. The loss is greatest among those who would have reached ages between 20 and 29 in 1980, had they remained in the Valley. For both municipalities survival ratios fall to the level of .49 to .56 (matching national rates are above .90). Since persons in this age range would be seeking first jobs and forming new households, the implication is that they have gone to the cities (primarily Davao City) for this purpose.

The argument from survival ratios is supported by data in Tables 12-13. Table 12 confirms that the decline in number of households is approximately the same as the net population loss, i.e., entire households rather than individual members from them are the migration unit. This is confirmed by the invariant nature of household size over the decade which remains at $6 \pm .3$ for both municipalities. However, the reduction by district in numbers of households is not uniform. The high farm income districts eliminated approximately one-fourth of the households present in 1970 from both municipalities (Table 13). Low farm income districts experienced less mobility.

B. Migration and retention of demographic balance.

The demonstration that emigration has taken place from these two rapid growth communities is of immense interest. It provides substantial proof that the young adults from these resource frontier settlements have no intention of falling into "the low level poverty trap" which snared their ancestors. By refusing to let population densities build up while the resource base is subdivided into smaller and smaller shares, they are declining the possibility of becoming either a client population or a rural proletariat.

But this demonstration also raises the more important question concerning their destination, for which the answers are provided in Table 14. While 40 to 50% of the adult descendants of Magsaysay and Matanao households have remained in the same municipality, more than one-third have relocated to towns and cities (35% from Magsaysay and 33% from Matanao). There is an interesting difference

in urbanization patterns: emigrants from Magsaysay have chosen higher order urban centers with greater frequency those from Matanao. For example, the choice labeled "Other Urban, Other Province" means either Cebu or Manila, the only cities with a rank higher than that of Davao City. Magsaysay emigrants chose this destination class with greater frequency, while selecting "Towns within Region XI" much less often than Matanao descendants.

More descendant children, upon reaching adult status, departed from Matanao than from Magsaysay. Once having decided to leave, they chose urban destinations over rural locations by a margin of 1.3 to 1. While fewer descendants left Magsaysay, they preferred urban over rural destinations by a margin of 2.4 to 1. It is evident that Magsaysay's children, having experienced a "high development" rural environment, were unlikely to opt for a less progressive rural community somewhere else.

The overwhelming majority of emigrant descendants from both communities are married (94%). Precisely two-thirds of both groups of emigrant descendants fall between the ages of 20 and 34, as was predicted on the basis of Table 11. But the generative role of these favored communities in making a permanent contribution to regional development cannot reach closure without knowledge of the position of this very important group in the economy of the settlements to which they have relocated.

The occupations of absent children from both communities are summarized by their destination class in Table 15. The employment rate for all male emigrants is 93%, but there are substantial occupational differences between the two communities. More than half (52%) of the Magsaysay emigrants are farm owners or leaseholders, but this is true of only two-fifths (42%) of male descendants leaving Matanao. For both, there is a surprisingly low level of farm laborer employment. While the proportion of young men from Magsaysay remaining in agriculture is large, they are in a position to utilize their technical knowledge to become successful in smallscale agribusiness.

The most effective comparison of the data in Table 15 is with the proportions of male employment described for sedentary residents of the two study sites in Table 7 for 1980. Agricultural employment among emigrant descendants is reduced by one fourth (21%) in Magsaysay, and by slightly more in Matanao (30%). Commensurate gains in the non-agricultural labor force took place among both groups of emigrants. The major non-agricultural category providing entry occupations was the blue collar, formal sector area designated "Other Wage Work" in the table.

In urban surveys conducted in Davao City since 1972 (Hackenberg 1982, 1983) it has been confirmed that the blue collar jobs in construction and industry at the unskilled level tend to be the points of entry for rural-to-urban migrants; not the informal sector as predicted by the Harris-Todaro model. These formal sector occupations represent the lowest level of income for any form of employment, paying substantially less than informal sector activities which represent a higher position on the mobility ladder.

Clearly the push factor in emigration was associated with the relative prospects for successful farming in both communities. In Magsaysay, 51% of young men leaving their homes remained in that municipality, as did 72% of all emigrants choosing a farm occupation. In Matanao, 42% of young married males leaving their homes remained within the municipality, and only 55% of those choosing to pursue farm employment chose Matanao as the place to seek work.

The most outstanding characteristic of the employment among female emigrant descendants is the relative lack of it. In the resident population of Magsaysay and Matanao, 78% of wives are employed; the matching figure for emigrant women (almost all married) is 33%. The difference is partly accounted for by age distributions: younger women are less frequently employed, and the emigrant population is much younger than the sedentary spouse groups.

C. Fertility dynamics and the reproductive decline.

The crude birth rates measured in the Digos-Padada Valley in 1970 were equal to, but no greater than, those established for the rural Philippines in that year. By 1977, the national family planning program (initiated in all regions in 1969) had accomplished a reduction of 24% in the rural CBR, bringing it from 44.8 down to 34.2 (Hackenberg and Magalit 1980: vii). As Table 16 confirms, however, the reductions accomplished in Magsaysay and Matanao were twice the national average, i.e., more than 50% in both communities. Birth rate reductions are confirmed by the declines in total fertility rates for all women and for married women (Table 16).

The declines in marital fertility give evidence that the family planning program initiated by the Philippine Population Commission has been effective. In our baseline study (1970), contraception was too recently introduced to have made a measurable impact. By 1973, according to Concepcion and Smith (1977: 35) the proportion of married women using any method in rural areas was only 12.5%. However,

as Table 17 confirms, by 1980 the Digos-Padada Valley rate had risen to 56% for married women in both municipalities. Use of the more effective methods (IUD, pills, sterilization) had taken hold among 32% of married women. Both utilization figures are substantially higher than those for four representative parts of the Philippines measured in 1978 (Hackenberg and Magalit 1980: 101). Finally, it is worth noting that the high farm income district of Magsaysay, which has often excelled on other modernization indices, has the highest rate of acceptance for effective methods (45.9%).

A contributing factor to the declining birth rate and total fertility rate for all women (Table 16) has been the changing pattern of marriage in the Digos-Padada Valley since 1970 (Table 18). Nuptiality rates have taken a breathtaking plunge downward since 1970. The changes for age groups 15-19 and 20-24 were especially great. The most plausible explanation is that younger women are staying in school longer and, after completing their educations, are cajoled to postpone marriage in order to supplement the income of the parental household with their earnings.

D. Education and improvement of human capital.

The level of investment in human resources in both communities took a substantial leap forward between 1970 and 1980 among age groups where improvement was most strategic for attainment of development goals. Among both young men and women, ages 15 through 24, mean grade attained in school advanced by approximately three years (Table 19). In addition to promoting delay of marriage, the advancement of education within the Valley means that the increasing numbers who will be leaving it will be better prepared to seek positions at higher levels of the settlement hierarchy.

The results are especially significant for young women, ages 20-24, in both municipalities. In 1970, this age group had only the equivalent of an elementary school certificate (six years of school completed). By 1980, women in this group averaged ten years of education which is equivalent to high school graduation in the Philippines. Male gains in this age group averaged 2.5 to 2.9 years, which though smaller, are quite substantial for the brief interval elapsing between the dates of measurement.

All theories of development advocate improvement of human capital as an indispensable component of advancement beyond the level of peasant agriculture (Hansen 1982; Oshima 1983). In the present case, educational gains accompany three trends in the preceding discussion: (1) the transition to scientific farming,

for which literacy and mathematics are required; (2) the expansion of business operations and growth of new enterprises; (3) the search for employment outside the Valley.

4. A Balance Sheet on Agricultural Modernization.

The majority of households in the study municipalities managed over the decade to increase their income and improve income distribution on a sharply diminished land base. This was accomplished by means of the following:

1. Improved yields of the primary crop, rice, the cultivation of which was greatly expanded.
2. Diversification into the production of commercial crops other than rice.
3. Acquisition of second jobs by a substantial number of those employed in farming.
4. Rapid expansion of labor force participation to include most wives and many children.
5. Inception of a thriving informal sector trade in livestock, poultry and garden produce.
6. Establishment of a large number of new commercial enterprises of the formal sector variety. i.e., requiring inventory, fixed prices, a regular clientele and goods of known quality and predetermined quantity.
7. Reduction of the tenant/leaseholder class of farm operator and diminution of this obsolescent niche in the socioeconomic structure of agriculture.

Land, labor and capital have all acquired a freedom of movement within a fluid and flexible market structure which is no longer characterized by fragmentation. The economic position of the lower class, or poverty stratum, in this population is protected by (1) expansion of economic opportunities as productivity grows faster than population, and (2) their own freedom to exploit these opportunities by mobility and multiple occupation and combined income source strategies.

One of the revelations of the Digos-Padada Valley studies is the insight that the small scale farm operator and landless working-class household both seek to protect their incomes by diversification. However, as noted in the discussion of Figure #1, the recourse to this option assumes that households have access to a variety of places of work (farm, market, and factory) from their places of residence. Stark (1981) speculates that Green Revolution farmers, because of their need for cash flow, will send children to urban centers to obtain wage work so that they may obtain a portion through remittances. While this would eliminate the need for centralization of a variety of income sources within commuting distance from the household,

it does not appear to be a factor in the Digos-Padada Valley. Emigrant descendants of Valley farm households are married, which relieves them of the obligation to remit a portion of their earnings to parents.¹

The overall impression of the consequences of conversion to high technology farming is apt to create a misplaced sense of euphoria. True, earlier fears expressed by most Mindanao-watchers that the grown children of the homestead generation would simply subdivide their farms and lapse into poverty were unfounded. However, it was noted at the beginning of this section that the seed-and-fertilizer revolution contains the seeds of its own destabilization.

First, as Binswanger and Ruttan (1977) demonstrated, there is a continuous tendency under high technology farming for "imbalance to arise among the factors of production"; which means simply that either land, labor or working capital to purchase inputs becomes too expensive to produce a crop at a profit. The rising cost of inputs such as fertilizer or fuel can have the same "disbalancing" effect. In their theory of induced innovation, it is the imbalance which translates into a need for further research and the generation of new technology to "solve" the problem. However, they recognize that the tendency toward imbalance is endogenous to the system; therefore, the need for continuing research is perpetual.

Second, the farmers of the Digos-Padada Valley have not been exposed to this "iron law of farm systems operation" because they have really been playing Monopoly and calling it capitalism. Their credit has been more of a grant than a loan under "Masagana 99". Since no collateral was required, neither bankruptcies nor repossessions have been permitted. The worst case situation for a "non-performing account" is loss of future credit from the rural banks (though not from other sources). There is abundant evidence that this system of unsecured credit is in serious trouble:

"Despite the strong performance of agriculture during the 1970s...the present condition of the rural credit markets is far from healthy. A large number of the loans made by both government and private banks have fallen into arrears, disqualifying many borrowers from further loans and disqualifying the banks from further discount privileges at the Central Bank...The privately owned rural banks have arrears of over pesos ₱1 billion owed to the CB, disqualifying about one-half of 1,041 banks from further access to rediscounting facilities. Much of

-
1. Among the surprises presented by the results of this study was the failure of residents of Magsaysay and Matanao to take advantage of the labor opportunities presented by the establishment of the sugar central (refinery) at Guihing in the municipality of Hagonoy (see Map #3). There were 14 persons in both municipalities employed by banana and sugar plantations while residing in either Magsaysay or Matanao within the study area. We did not report the number of adult descendants who left the study sites to seek work in the plantations however.

the problem has arisen in government-sponsored supervised credit programs designed to achieve production targets for specific crops. Currently, about two-thirds of all agricultural credit is being provided by informal or non-institutional sources. Institutional credit rose to 68% of all credit in the mid-seventies when the government sponsored supervised credit programs were in full swing (1975) to fall back to only 32% in the late seventies" (World Bank 1983: i-ii).

This was complicated by government recourse to subsidized fertilizer and chemicals, coupled with price supports to farmers and ceilings for the benefit of urban consumers. Since 1980, "deregulation" has been in full swing and decontrol has been accomplished under terms of a joint IMF/World Bank review. There is no doubt that Philippine farmers will have severe problems readjusting to the high cost structure of HYV production in a free market for credit and inputs.

Third, in a free market environment, the diversified choice of supplementary cash crops---coconut, sugar, rubber, banana or coffee---becomes subject to the fluctuations of the world commodities markets. During the latter part of the 1970s, both sugar and copra were severely depressed. In September, 1982, sugar prices fell to 10-year lows (Far Eastern Economic Review 1983: 76); copra income between 1979 and 1983 was reduced by 47% (USAID 1984).

Fourth, although sources of household income became diversified within the region during the decade, the types of goods produced by small scale enterprises did not. Industrial productivity within Southern Mindanao was concentrated in a few capital intensive, export-oriented agribusiness categories: banana plantations, sugar production, timber concessions and timber processing (plywood is a major component of regional GDP), tree-farming and pulp paper manufacture.

There was an obvious absence of agricultural processing of products for local consumption: meat, fish and poultry were outstanding examples. With the exception of a small informal sector trade in dried fish, these were eaten fresh or not at all. No fresh fish is available for sale at distances greater than 30 kilometers inland from the Davao Gulf. Although there is a good market for smoked and cured meat, it is not produced locally. The same is true for dairy products, housewares, clothing and construction materials.

In previous years, the justification for neglecting small scale manufacturing was (1) there was no local demand, and (2) goods of a quality sufficient to compete with items from Manila or from abroad could not be produced. Neither argument is

valid today. There is an abundance of cash in the countryside for investment, and there is also a range of suitable machinery on the technology shelf. Both Ranis (1973) and Oshima (1981) have proven that labor-intensive industrialization with limited investment in small, portable machines is feasible in the Southeast Asian countryside.

To save the gains and constrain the destabilizing consequences of the Green Revolution, a subsequent layer of economic growth must be superimposed on the foundation which now exists in the Digos-Padada Valley. The next stratum must incorporate small scale industrialization with employment generation in a revised system of settlements offering suitable facilities in addition to existing infrastructure. This new stratum blends the components we have defined as microubanization.

Microubanization requires the receptive environment which farm modernization provides. The fitness of this environment is demonstrated by the many features of selective regional closure which it manifests. These features, which blend into a self-sustaining growth pattern, include (1) capital (savings and profits) originating in farm operations and land sales which has been invested in increasing and expanding local firms; (2) upgrading the quality of the labor force with further education; (3) movement of labor out of agriculture and into a diversifying network of wage work and commerce; (4) rapid expansion of personal income; (5) rapid growth of a range of private professional and technical services which support new enterprises and fill demand based on expanded income; (6) local government agencies proliferate to implement national policy, provide and maintain infrastructure, offer minimal indigent care, and perform regulatory functions.

The settlements of Davao del Sur have retained sufficient wealth to reinvest in promoting the evolution of a scatter of homesteads into a diversified, export-oriented economy. Closure will always be incomplete. Both public and private investment from outside the region have been indispensable. There is substantial leakage of profits, especially from the multinationals representing major manufacturing. And there is excessive dependence on imports (incoming manufactures). But a critical balance between leakage and income has been maintained. The established linkage between capital, labor and resources existing in Southern Mindanao has contributed impressively to its growth.

C. Generating Microubanization: Building upon the Green Revolution

Economists with broad field experience from both ends of the political spectrum are laudatory about the status of the seed-and-fertilizer revolution as of the end of the last decade. Among the more conservative spokesman, Ruttan (1977: 20) observes:

"...the contribution of the new seed-fertilizer technology to food grain production has weakened the potential for revolutionary change in political and economic institutions in rural areas in many countries of Asia...The green revolution has not turned red. In spite of widening income differentials, the gains in productivity growth, in those areas where the new seed-fertilizer technology has been effective, have been sufficiently diffused to reinforce interests of most classes in an evolutionary, rather than a revolutionary pattern of rural development."

And from a somewhat more liberal perspective, Michael Lipton (1978: 330, 335) adds a similar comment:

"Common sense...suggests that, without the extra food and work provided by HYV's, the poor would have been even worse off, and in many cases dead.... HYV's, of all agricultural technologies recently developed, have most potential for helping the poorest rural people. Owners of international big capital, unlike owners of domestic capital in LDCs, are increasingly convinced that this must be done (a) to insure 'stability'; (b) to maintain demand; (c) to ease consciences."

As a result of the investments of the 1960's in infrastructure and institutional development, a productive smallholder agriculture is a going concern. In part because of the political protection it has been accorded, and in part because of its own vitality, it has competed successfully with multinationals and indigenous elites to retain control of its resource base. Its record of accomplishment in places such as the Digos-Padada Valley stands as proof that urban functions have been effectively provided to support rural development and with minimal investment in an urban hierarchy of settlements.¹

-
1. The "completeness" of urban hierarchies is relative unless one applies an arbitrary measure such as the rank-size rule or log-normal curve. Magsaysay poblacion had a census population of 4,357 in 1980. It was the smallest "urban place" in the hierarchy serving its farm community. Next, at a distance of 8 kilometers by dirt road (all weather with good bridges) is Bansalan (12,306) on the national concrete highway. At a further distance (40 kilometers from Magsaysay, 32 kilometers on concrete highway) is the provincial capital of Digos (26,919). Finally, at a distance of 100 kilometers from Magsaysay, 92 kilometers of concrete and asphalt surfaced all-weather road, is Davao City (408,775). Bansalan, once the market town for three municipalities, has diminished in importance as local poblaciones have developed daily markets in each of them. It has few facilities not found at the local level. Digos, however, has administrative, commercial and service facilities unavailable at lower level centers (three hospitals, two colleges, several private banks, professional offices, garages, construction materials, a grain elevator, a bus terminal, a city market with permanent structures). Davao City, the second largest in the Philippines, is a leading port and industrial center.

Without seeking to minimize these accomplishments, the outcome is unbalanced growth. In Hirschman's terms, this concept designated "unbalance" as selective investment in industrialization with complementary urban growth; what we have seen during the past decade is the reverse: selective investment in agriculture with complementary rural development. Among the unfavorable consequences are too many people and too much investment committed to food production for the domestic market; furthermore, a large portion of the bill for this production is being paid by subsidies directly resulting from foreign loans (including the wage bill).

As Oshima (1983) and Ranis (1974) have argued, further increases in labor productivity in agriculture must be accompanied by transfer of a substantial portion of the labor force to other sectors. As workers enter the manufacturing and services sectors, the demand for food by non-food producers increases, as does their capacity to pay for it. The immediate result is the opportunity to raise food prices to market rates, thus removing agriculture from the list of "protected" sectors which require input and credit subsidies in order to survive.

Microurbanization is a process which may serve as midwife to the birth of this next stage of small scale industrialization in rural areas. In Figure #1 (pg. 11, vide supra), and accompanying text, it was argued that from the point of view of the rural household both growth and diversification of income (and also income security) require the deployment of household members to three types of workplace: farm, market and factory. The description of agricultural development in the Valley during the 1970's refers frequently to the first two places of work, which have been effectively combined through women's activity in the informal sector. But industrial employment has not kept pace with the expanding labor market in the other two areas.¹

In this final section of the essay, the components of development needed to augment Figure #1 with the third place of work, small scale industry, will be considered within the framework of the following outline:

1. Objectives of microurbanization from the perspective of national development.
2. Needs of existing settlement networks to fulfill these objectives.
3. Assumptions guiding projects aimed at filling those needs.
4. A project inventory for promotion of microurbanization.

1. As noted above, the anticipated employment on a part-time basis by the sugar and banana plantations of Magsaysay and Matanao household members failed to materialize. Clearly distance to these workplaces (50 to 60 kilometers from place of residence) was beyond the acceptable radius for commuting. Emigrant descendants may have availed themselves of these employment opportunities but the data in Table 15 indicate that they were not quantitatively significant (see "Other Wage, Same Province, Rural").

1. Objectives of microubanization from the perspective of national development.

The conceptual definition of microubanization (vide supra, pp. 8-12) provided a perception from the viewpoint of the household. However, agricultural development has taken place as the result of a policy of promoting rice self-sufficiency which originates at the opposite end of the spectrum---the national level. It follows that unless microubanization can be shown as a route toward the realization of national development goals it has little chance to be implemented.

From the policy-maker's perspective, an interdependent package of objectives may be unfolded in the following terms:

- a. The first priority is the expansion of private sector enterprises primarily by agricultural processing operations to be located in the lowest order urban places with the expectation that they will stimulate farm production to higher levels of output and diversification.
- b. By this means (1) retain savings and profits within the region generating a vigorous rural financial market, and (2) create rural non-farm employment in small-scale enterprises at low levels of investment per job.
- c. Achievement of a-b will also (1) retain rural population in lower order settlements and rural areas; (2) expand the market for urban manufactures while (3) strengthening the network of enterprises and services needed to deliver them to rural consumers.
- d. And in broader perspective (1) increase the degree of regional closure (2) contribute to the growth of lower order urban settlements, and (3) reduce interregional inequities in growth and distribution.

The route toward these objectives via the private sector is virtually unexplored in developing countries. The objectives themselves are trite; in fact, items c-d above were stated first in this essay as goals for secondary urbanization (vide supra, pg. 1). The innovative elements are the steps emphasizing agricultural raw materials processing and employment generation in rural non-farm settings in a-b above,¹

The other unfamiliar dimension of the microubanization path toward development goals is its rejection of the development loan and public sector agency mechanism. Emphasis is to be placed on local capital formation, private entrepreneurship and investment in superstructure rather than infrastructure. The recourse to minimal

-
1. The rural non-farm emphasis has gathered momentum in the writings of a number of development scientists during the 1970's. See the discussion of the contributions of Arthur Gibb, Richard Rhoda, Dennis Anderson and Mark Lieserson in Hackenberg (1980: 405-406).

investment in cost recovery is more than a rational response to economic life in this "retrenchment decade". Given the need to replicate the microubanization process many times in a wide range of rural communities throughout the region, a low cost strategy would be imperative even in more affluent times.

2. Needs of existing settlement networks.

Lower order urban centers have been overlooked in the distributor of infrastructure benefits provided either by government agencies or development lenders with several noteworthy exceptions. Most are linked to higher order centers by good road systems and have electricity. Beyond that, their share of public expenditure can usually be represented by a municipal hall, a court house and police station (often in the same building), and one or more education centers for primary and secondary schooling.

In the Spanish Philippines, founders of communities utilized the plaza complex concept: a central square was dedicated to public service and on each side could be found the municipal hall, town market, principal church and court house.¹ In resource frontier areas, whose settlement was largely post-colonial, this nucleus of a central business district is lacking together with the spatial structure it provided to the community. In Southern Mindanao, Davao City which was founded in the late 19th Century conforms to the plaza complex and also has a grid pattern street design forming its core. This generalization does not apply to Digos, the provincial capital of Davao del Sur, or to lower order urban places.

It is difficult to comprehend the degree of urban efficiency which is pre-ordained by conformity to the plaza complex, and the chaos which develops without it. The plaza represents both the geographical center of the community and also the focus of trade, worship and administrative contact. Since anyone "coming to town" comes to the plaza, it becomes the terminus for both intracity and intercommunity transportation. The provisioners of city markets and their customers arrive on public transportation so the plaza becomes the transport terminal (usually de facto rather than de jure).

Around this geographical focus, tradesmen gather to set up shop and avail themselves of the concentrated volume of traffic. Market processes create a central business district which is the home of both formal and informal sector commerce. The spillover enterprises locate on the main traffic artery leading into and out

1. This section draws upon the classic presentation by Donn V. Hart, The Philippine Plaza Complex: Focal Point in Culture Change. Southeast Asia Studies. Yale University. 1955.

of town in diminishing density as distance increases. At the edge of the CBD the shops of artisans and craftsmen (furniture makers, glaziers, welders and machine shops) are located. Beyond these, small scale industries appear (building materials yards, auto body builders, sheet metal works, cement block makers).

The plaza complex, in short, establishes the prototype for an agglomeration economy in Davao City, but not the type encountered in metropolitan environments. Binswanger and Lieserson, in their evaluation of the urban contribution to growth in Thailand during the 1970's, deny that secondary cities are favored by actual economies of scale:

"It is doubtful that technological scale economies are an important factor....From the point of view of any given producer, the economies are most likely to be economies of scope, i.e. economies which arise out of the multiplicity of goods and services offered in an urban area. The supermarket analogy is relevant, where, for the consumer, the economies arise from the multiplicity of goods offered, not from the scale of his purchases. On the input supply side, economies of scope arise in the wider variety of production inputs, production services, credit services and skills available in the urban area....On the output side, economies of scope arise from the variety of customers in easy reach, and the multiplicity of transport, marketing and communications services which can be used to reach consumers and markets elsewhere" (World Bank 1983: 11).

however, Davao City, a regional metropolis is a higher order community from those customarily considered when analyzing urban functions in rural development. Chetwynd (1980), following Rondinelli and Ruddle (1978), identifies regional centers, market towns and service centers in descending order as the elements of a system of settlements for expediting rural development. In the Digos-Padada Valley, these are represented by Digos, the provincial capital, Bansalan, on the national highway and the Magsaysay poblacion (vide supra, f.n., pg. 49)

None of these has a plaza complex. Digos, the provincial capital (1980 pop. 27,000) is illustrative. The municipal council in 1980 designated a vacant site on the south edge of town for the new city market. It is served by motorized tricycle from the center of town. At the same time the Ministry of Local Government authorized the construction of a new provincial government complex four kilometers west of town. It is also reached by tricycle. Schools, churches and the municipal offices remain near the center of the city, defined by the intersection of the major north-south and east-west highways. Digos has no transport terminal but the intercity bus traffic loads and unloads near the old city market place near the

geographical center of the town.

Commercial enterprises and small scale industries in Digos were formerly concentrated near the major intersection of highway traffic. They are now rapidly decentralizing to the south and west. Like Davao City, Digos has an immensely congested city center. Unlike Davao City, this congestion represents the crush of traffic at a transit point which must be negotiated to get to either of the two major places of work and business transaction: the new city market and the provincial government site. In Davao, the central business district is the destination point near which all these transactions take place. It is congestion with a purpose. The congestion in Digo impedes performance of urban functions.

Much as it screams for a major overhaul, it is unlikely that Digos and the thousands of urban places like it throughout the developing world will ever be redesigned by an urban planner in the interest of realizing the implicit multiplier effects that could be derived from proper placement of urban facilities. Adherence to the plaza complex has inadvertently built economies of scope into the urban design of Davao whose small central business district, densely packed with almost every type of formal and informal sector service, does indeed resemble a mammoth supermarket. Its much greater efficiency as an urban center is undoubtedly related to the frustrating fact that Davao, like other Philippine metropolitan centers, grew much faster than Digos and similar provincial capitals during the decade just completed (Hackenberg 1982: 155).¹

This brief excursion into urban geography of Southern Mindanao is justified by the important lesson to be drawn from it. According to conventional urban and regional planning, investment in the development of small industries should take place at the highest order of urban place serving a region. Digos is the logical "growth center" for the Digos-Padada Valley (see Map #3, pg. 23). The planning tools, possible new facilities and budget available do not lead to an encouraging prognosis for Digos. For example, the city clearly needs a transport terminal but its placement at any available site would serve only to further decentralize services which should be contiguous if functional linkages are to be achieved. It would not be cost effective, and costs would be prohibitive.

-
1. Much of the urban efficiency acquired by Davao City through adherence to the plaza complex is about to be fragmented by the strategy being pursued by the World Bank's Regional Cities Development Program. The RCDP aims to decongest the central city by relocating bus traffic to remote terminals at opposite sides of the CBD, decentralize traffic from Bankerohan Market to satellite markets and divert much through traffic to an urban by-pass route.

The same constraints do not apply to the market town or service center identified above. Neither Bansalan nor Magsaysay poblacion have equivalent sunk costs in misplaced facilities. Both have designated areas for market sites and transport terminals but neither has invested in construction which will freeze them in cement. A potential spatial configuration linking facilities offering the prospect for implicit multipliers, or economies of scope, is still possible in both of them. What is true for Bansalan and Magsaysay is also true for most market towns and poblaciones in the region. An arrangement equivalent to the plaza complex may be contemplated for these lower order centers.

Once again, a virtue can be made of necessity. The market town and service center become targets of opportunity for microubanization viewed "from above", i.e., from a regional planning perspective. The regional center is ruled out for pragmatic reasons. However, it should be recalled that the purpose of the strategy under review is to provide the household with access to multiple sources of income by combining jobs in farm, informal sector and industrial employment. This goal would be compromised if we were to concentrate development strategies in Digos, almost fifty kilometers from rural locations in Magsaysay and Matanao.

3. Assumptions guiding microubanization.

The consequences of rapid agricultural growth for the expansion of rural non-farm employment in Thailand are similar to those in Southern Mindanao. A recent World Bank (1983) study team observed a low level of urbanization combined with heavy investment in infrastructure and effective delivery of urban services to rural farm households over good transportation networks.

In Thailand, as in the Philippines, secondary cities play a limited role: a single primate center monopolizes manufacturing of goods for internal and external markets. Intermediate cities act as distribution centers for primate city manufactures and locations for industries based upon local resources. Thus, for example, Davao City distributes Manila's manufactures to its hinterland and produces plywood from its own timber reserves for export elsewhere.

Finding a viable role for industries within lower-order centers requires that suitable assumptions, based on familiarity with local conditions, be employed. First, as the World Bank study team concluded, there is little hope for non-resource based enterprises to survive. The argument that labor costs provide an incentive to entrepreneurs to move operations to small towns is specious. It disregards the premise

presented in the preceding section that all Southern Mindanao has become a single unfragmented labor market. Conversely, the economies of scope on which producers based in larger cities depend are not available while transport costs to urban markets are increased.

Furthermore, the penetration of rural markets by distributors for primate city manufacturers has been facilitated by the road system. Even in remote villages with periodic (once per week) markets in Southern Mindanao, trucks from Davao City arrive shortly after dawn with inventories of ready-to-wear clothing, shoes, tools and housewares. In larger villages or service centers, these markets evolve to permanent (daily) status with local stallkeepers maintaining a permanent inventory of these goods for sale. There would be no comparative advantage to producing the goods closer to their ultimate destinations: the rural consumer household.

However, transportation systems flow in both directions. If urban distributors have captured the rural market for manufactured goods, it follows that rural producers, utilizing local agricultural resources, have the reverse opportunity to penetrate the urban (Davao City) market for farm products. Here is where substantial gains can be made for rural non-farm employment through agricultural processing. In the World Bank study of Thailand, a dual strategy is advocated which seeks to exploit both proximate rural and remote urban markets insofar as possible:

1. Highly perishable consumer goods can be produced for the local market in competition with urban manufactures. Examples are bakery goods, fish, meat and vegetables.
2. Bulky or heavy consumer goods intended for the rural market has a cost advantage if produced near the ultimate point of sale. Examples are building materials (lumber, concrete block), farm machinery, and furniture.
3. Heavy manufacturing for distant markets can be located successfully in rural environments if based on local resources and if the processing which takes place succeeds in substantially reducing either bulk or weight prior to shipment. Examples are rice and corn milling, sugar refining, sawmill operation, mineral processing.

The dual market strategy is applicable to Southern Mindanao, but proximity to a major city with a potential market of a half-million people suggests that the processing of farm products offers the best opportunity to sustain growth within the Digos-Padada Valley by stimulating agricultural production and generating employment. Large as it is, the Davao City market is only one-sixth of the population of Region XI, Southern Mindanao. It follows that a successful dual market strategy will not

be defeated by a lack of customers.

A final assumption concerns finance. The traditional method throughout South-east Asia for initiating a rural industrialization program would involve (1) securing a foreign loan; (2) recruiting and organizing a new bureaucracy with decision-making centralized in Manila and field level staff deployed throughout rural areas to be served; (3) soliciting participation of local entrepreneurs with offers of subsidized credit and technical assistance.

There are several objections to this procedure. The core of the initiative is a small industry loan program with capital provided at below-market rates. This procedure has received an elaborate and negative review in a recent World Bank report (Von Pischke, Adams and Donald 1983). The core conclusion is that subsidized credit may accomplish initial objectives in rural industrialization as it did with the seed-and-fertilizer revolution. But it does so at the price of (1) a substantial addition to total foreign debt and debt service requirements, and (2) a fatal blow to the prospect of forming rural financial markets by generating savings and attracting outside private capital.¹

4. A project inventory for promoting agricultural productivity.

It is generally accepted throughout the development fraternity that import substitution failed because (among several reasons) it was aimed at a narrow market for luxury and high technology goods which was quickly saturated. The replacement strategy of export promotion is encountering heavy weather because of the approaching saturation of the world market for T-shirts and transistors. What is true at international and national levels is also true at the local level. A promotion policy for small scale industry must be aimed at an existing market which is robust enough to withstand minor fluctuations in the economy, i.e. inflation and currency depreciation, cyclical movement of world commodity prices and the like.

Such a market exists within the Davao City trade area for animal protein foods: eggs, fish, meat and poultry. If the decade of the 1970s has been a period of great growth in agriculture based on cereal production, it has also been an interval of uncontrolled inflation: the 1980 consumer price index was 250% of its 1972 value

1. In their critique of agricultural lending practises under "Masagana 99" the World Bank (1983) report on agricultural credit notes that the rural banks became mere retail outlets for credit provided by the Central Bank of the Philippines. They made no attempt to diversify their services by attracting savings or attempting to generate reverse cash flow. Thus, the unintended consequence of subsidized credit was the removal of the opportunity to create a self-sustaining rural financial market.

(World Bank 1980: 1972). Wage increases have neutralized no more than half of the skyward climb in prices (World Bank 1980: 173). While basic cereals (rice and corn) have been price controlled in major urban markets (government stores have been established to insure distribution in poorer neighborhoods), nothing has been done on a continuing basis with reference to other elements in a balanced diet: animal protein and vegetables.

The rising price and diminishing quality of meat and fish in Davao City can be traced to several factors. Ranch cattle and stock farm pigs raised for the luxury trade and upper class consumption in Davao during the 1960s, are now shipped to Manila and overseas. Large prawns and first class fish (tuna and red snapper) which were abundant at reasonable prices when taken from coastal waters with small boats (bankas) by native fishermen are no longer available. The heavy concentration of fertilizers and pesticides draining from rice farms and sugar and banana plantations into coastal waters has killed prawns (now raised inland in capital intensive fish ponds) and driven large fish further out to sea. This situation has attracted Japanese-financed trawler fleets to invade Davao Gulf and tuna and red snapper are now taken for foreign commercial markets. Prawns are iced and air-freighted to the thirteen Manila five-star hotels.

The changing nature of supply, coupled with rising costs and diminished purchasing power, has had a substantial impact on patterns of food procurement, distribution and sale in the Davao City trade area. Davao Research and Planning Foundation assigned Gerald Barth (1982) to make a comprehensive field study of this subject. His study included field interviews with a stratified sample of market stallkeepers and grocers dealing in meat, poultry, fish, fruits and vegetables and cereals. It also incorporated a stratified sample of Davao City households, analyzed by social class, to obtain food purchasing and consumption patterns.

Barth's research yields three important generalizations which pertain to the construction of a project inventory for the Digos-Padada Valley. The first pertains to changing food consumption patterns in Davao City. Animal protein consumption has sharply diminished during the preceding decade, especially among lower class households. In 1981, all three classes of households were found to have eaten fresh fish daily but pork no more than twice per week. Chicken and beef have class-specific consumption patterns: twice per week in upper class households but no more than twice per month among the lower class.

Secondly, procurement of meat, pork, eggs and poultry for the Davao City market is handled on a small scale basis by a large number of middlemen who travel the countryside by public conveyance or by truck, purchasing directly from farm operators---or more often---from their wives who are the actual managers of these barn-yard piggeries and poultry enterprises. The middlemen are frequently relatives of stallkeepers in the meat section of the Davao City public market (Bankerohan). Credit agreements and advances for expenses are frequently arranged between the "businessmen" and their suppliers for vegetables in addition to meat products (Barth 1982: 107-121). Pigs and chickens most often travel to market on the tops of jeeps or minibuses on trips originating in villages of the Valley. Since fresh supplies must be procured seven days per week, the volume of this traffic is very heavy. It explains the rapid growth of "agricultural non-farm" jobs among the women of Magsaysay and Matanao between 1970-1980 (see Table 7).

Thirdly, Barth (1982: 211-215) tested the hypothesis that selective regional closure was operative in the food procurement system of Davao City. Specifically, he investigated and confirmed the proposition that all major food items consumed in Davao City (with the exception of packaged and processed items) came from within the region. He was able to locate the sources of cereals, meat, fish, poultry and eggs and fruits and vegetables within the region. It follows from this that an effort to improve the production and increase the supply of any of these items in the Digos-Padada Valley would find a ready array of consumers in Davao City, whose households were spending 45% of their gross income on food purchases. The plantations and rural industries of various sorts represent another substantial set of market outlets for local production.¹

To initiate microubanization within the municipalities of Magsaysay and Matanao, the preceding sections have demonstrated (1) the lack of a configuration of urban facilities suitable for stimulating local industry such as the plaza complex; (2) the superiority of a strategy aimed at penetrating the urban (Davao City) market with farm products rather than trying to capture a rural market with locally manufactured goods; (3) the existence of substantial demand for animal protein in the urban market; (4) the existing interest in producing pigs and chickens among a substantial number of Magsaysay and Matanao women.

-
1. Barth reported that plantations and timber concessions with residence compounds for workers operate retail outlets for food and household essentials. Food is obtained on contract with middlemen in the Davao City market for scheduled delivery.

The disorderly array of urban functions present in the rural service centers of Magsaysay and Matanio, and in the market town of Bansalan, has grown by accretion rather than by design. The spatial placement of a facility or service reflects the date of its inception and the availability of space along the main thoroughfare at that point in time, for these are linear communities. Such functions as have materialized are, of necessity, incomplete and mismatched. They are also dispersed. Growth is slow because implicit multipliers have not been generated.

The premises established in the preceding pages lead to the conclusion that a plaza complex at or near the community center generates efficiency by maximizing the probability that implicit multipliers will evolve and establish linkages. The mutual positive feedback links between transportation, commerce, administrative services and ritual observance seem hard to surpass. Since these did not spontaneously evolve in either rural service centers or the market town serving the Valley, they must be experimentally reproduced.

Because our interest is in economic development, we will select only those components of the complex which are relevant for increasing agricultural productivity, promoting processing of raw materials, stimulating private sector growth and generating employment. These components include minimal elements of transport, commerce and administration, to be introduced by procedures which will maximize their potential for self-management and self-direction while minimizing cost requirements.

The microurban complex must be permitted to grow at its own speed up to the level of complexity which can be supported by its resource base. At present, there is no way to predict this, hence, the experimental nature of the process. Furthermore, the contours of growth in different types of enterprise must be determined by factors implicit within the changing interplay of relationships between communities within the region. There is no effective way to predict this either, but the nature of the intervention must be aware of it and sensitive to it.

The microurban redesign for the market town, Bansalan, can commence with the introduction of three elements in rudimentary form: a transport terminal, a live-stock/poultry market, and a financial/technical center. The discussion of ten-year trends in agricultural expansion and diversification within the region supports the inference that placement of a nucleus of interacting improvements within a central market town will trigger a take-off into second-stage self-sustained growth, based this time on commerce and small-scale industry.

a. A transportation terminal.

The purpose of concentrating arrivals and departures of public transportation at a central point within the community is not traffic management. It is to generate the heaviest possible volume of traffic at a point where commerce can also take place. It is far more important to establish contiguity between transportation and marketing than to pour concrete surfaces for parking, construct waiting rooms and ticketing facilities, or provide kiosks for rental by food service concessions and newsdealers.

What is needed is a dedicated site for the arrival and departure of intercity buses, minibuses serving smaller towns and poblaciones, and jeepneys plying routes connecting cities and towns with rural locations. A traffic pattern needs to be established for routing each type of transportation from the national highway which forms the spine of Bansalan (see Map #4) to the terminal site, and segregated parking at the site is also an essential planning ingredient. The basis of segregation is (a) type of transport vehicle and (b) route to be followed upon leaving Bansalan for subsequent destinations.

Although Bansalan is a linear strip community transected by the Pan-Philippine Highway, a strategic location for the transportation terminal is provided by the proximity of the municipal hall to the town market site. Both these occur near the intersection of the national highway and the lateral road leading to Buenavista and more distant mountain communities. A site along the lateral road procured by the Bansalan municipal council would serve the purposes we have in mind.

The primary attribute of the terminal is space. At present, transportation of all types loads and discharges passengers indiscriminately along the shoulders of the main highway at the discretion of the customer. Arrivals and departures can be concentrated in the vicinity of the town market to the benefit of all types of commerce transacted there, but a site containing several hectares will be needed to accommodate the volume of traffic.

Construction on the terminal site should be minimal. The municipal council can sell a service station concession to one of several oil companies in the area and it will finance its own facility. Parking shelters consisting of galvanized iron sheets on wooden frames to protect from sun and rain would be sufficient. It is more important to see that the site is well drained than that it is expensively surfaced. If space is adequate, areas should be reserved for additional shops and market stalls to accommodate expected growth of commerce beyond what is presently managed by town

market facilities.

A seedling investment is proposed for the transport terminal. Success in generating additional market traffic and volume of commerce will create intolerable imbalances within the present market area and proposed terminal. But it will also create a tax-base for collecting municipal funds through which a replacement (perhaps "permanent" would be a good term to insert here) improved market-cum-transport terminal could be financed. That might be an appropriate point at which to begin pouring concrete and providing public toilets and waiting rooms.¹

b. A livestock/poultry market.

Purchase of pigs and chickens takes place in an unorganized market. Buy-and-sell pig dealers travel the countryside seeking mature animals. The housewife producer is in a poor bargaining position. If she rejects the dealer's offer and needs cash, she must either sell the pig cheaply in the Banasalan market or transport it to Davao City for sale at Bankerohan where the price will depend on the daily supply situation. With chickens she has no choice since their price will not cover the costs of a trip to Davao City and leave a profit. She will market them herself at roadside to local jeepney traffic or wholesale them to a vendor in the Bansalan town market.

This is inefficient trade in items for which there is a sustained urban demand. Prospective buyers have an uncertain supply and little choice of sizes or grades of animals; prospective sellers are unable to bargain for the best price among competitive bidders. Increasing the volume of livestock and poultry available at a single point of sale would operate to the benefit of all, assuming the existence of sufficient demand in Davao City. A simple and rudimentary livestock and poultry market in Bansalan adjacent to the transport terminal will stimulate production, provide an opportunity for processing, and generate employment.

The market will increase the volume of pigs and chickens available since farm women will not depend on the arrival of itinerant buyers or the roadside trade. It seems clear at present that production is restricted by traditional methods which limit the radius of distribution for the animals. This creates a fragmented market in which Valley housewives are partially isolated from the demand existing in Davao City. This reduces the price available to them for their output and raises the price which must be paid by the urban consumer household.

-
1. A transaction tax could be collected on vehicles using the terminal and a sales tax might also be levied on market volume. If this were set aside in a dedicated fund for market and terminal improvement, it would tend to quiet objections. Innovative self-financing is essential to future improvements in urban infrastructure and it will probably need to be sought at the local level.

As with the transport terminal, the livestock and poultry market should emphasize exchange functions and restrict concerns for appearance and physical facilities. Minimal facilities would consist of holding pens for pigs and chickens. We visualize a trading situation in which owners of the animals would conduct their own negotiations with buyers who, in turn, would arrange for their own transportation of stock purchased to Davao City or to intermediate points. The market should be established by Bansalan municipality which would benefit substantially from the operation of the market.

While operating personnel should be kept to a minimum, since the intent is to reduce transaction costs while raising efficiency, a fee should be collected from sellers for use of the facility and from buyers as a percent of the transaction. Funds should be set aside in a separate account for the improvement of the service. Once again, if successful a number of higher order functions can be added at a later date from the proceeds of earlier operations. From the beginning, however, several supplementary categories of sales and service should be incorporated into the market's functions.

Restricted cash flow is a continuing inhibitor to expanded business operations in the Philippines. In simpler terms, buyers can only acquire as many pigs or chickens as the cash in their pockets will cover. Since buy-and-sell operations are characterized by 24-hour turnover (pigs purchased in Bansalan one day would be sold in Davao City on either the same or the following day) credit terms should be available from a financial facility located at the point of sale (not in Davao City). Local entrepreneurs are accustomed to paying 20% interest on short term loans (borrow five, pay back six); 10-15% from a credit facility would be very attractive and would act to immediately expand sales volume. Profit from loans should be plowed back into the market's capital fund.

The financial service operated at the livestock-and-poultry market should also act as a savings-and-loan for growers. Registered livestock-and-poultry raisers should be encouraged to deposit a portion of each sale at a high rate of interest (it might be possible to offer 10-15% on long term deposits of three months or more if short term turnover on 24-hour loans is being earned at the same rate). Loans could be made to registered members for the construction of permanent facilities on their farms (pens, water, feed storage, etc.,). A reputable private sector bank, such as Bank of the Philippine Islands, might be interested in undertaking this experiment.

Improving quality is another way to expand sales volume, and it can be accomplished (like the financial service) at low or no cost. Housewives in the poultry-piggery business have little specialized knowledge of the subject. Chicken and egg production, and the quality of pork produced, could be greatly enhanced if they had access to information and inexpensive technical inputs. There are Bureau of Animal Industry (BAI) and Bureau of Agricultural Extension (BAEX) technicians assigned to this task at present, but they have no way to discharge their functions efficiently; e.g., they try to organize "clubs" and hold meetings which are ill-attended, or else they make systematic home visits at very infrequent intervals and averaging no more than a few minutes at each stop.

The livestock-and-poultry market should have adjacent offices (built at BAEX and BAI expense) for a permanent staff of technicians who would work the animal pen area, spotting diseases, weight problems, poor breeding results, etc., and offering appropriate advice. They would also be available in their offices to discuss specific problems. However, most livestock-and-poultry problems in the Valley are breeding and feeding problems. Cheap solutions are available for both of these problems.

A feed mill and retail outlet should be added to the livestock-and-poultry market when it has proven itself to be a success and its survival is no longer in question. Rice husk and corn are both available locally; husk is a by-product of milling operations and there are approximately one hundred mills within fifty kilometers of Bansalan. Upland corn is becoming a serious problem for its producers. The success of the seed-and-fertilizer revolution has permitted many hundreds of thousands of consumers in Southern Mindanao to change their basic cereal from corn (always associated with the unsophisticated villagers) to rice (the "city food"). As a consequence, corn is available for sale and for preparation as animal feed. Nutrient additives, to be prescribed by the BAI and BAEX technicians, could make the feed mill operation a tremendous asset for the improvement of quality livestock and poultry. The mill should be a commercial venture with initial financing provided.

A veterinary should be permanently available at the market site, and he should be encouraged (required) to stock supplies and medicines to be sold at a reasonable markup above their retail price in Davao City. A current problem for Valley producers is the need to travel to Davao City for advice, supplies or both. This service, like the other described, should be provided by a practitioner as a commercial venture almost sure to turn a substantial profit.

As with the transportation terminal, the livestock-and-poultry market offers the opportunity to develop a whole range of downstream or second generation benefits which could be financed from its profits within a few years. It would be inappropriate to close without indicating the scope of these prospective developments because they contain the flower of the microunurbanization growth process, for which the transport terminal and livestock-and-poultry market are the seedling investments.

c. An agricultural processing center.

Success creates imbalance. A transport terminal and livestock-and-poultry market begun with a minimal investment will soon outgrow the facilities provided. If the rate of income generates sufficient revenues to the municipality, a commercial center combining town market and transport terminal should be constructed. Together with private enterprises which would be developed as investments by local entrepreneurs anxious to share in the volume of business created by expanded customer traffic, the commercial center should become Bansalan's central business district. This could take place within five years---certainly no more than ten.

Financing for local entrepreneurs interested in participating in an expanded commercial center would be available from the livestock market's savings and loan facility which should expect to acquire the stature of a full-service bank. Control over credit provided would give some leverage to determine that enterprises added to the commercial complex would be those which are really needed by Valley residents.

Growth of this sort could take place sui generis; i.e., with minimum guidance provided by the Bansalan municipal council. However, a town market and transport terminal evolving into a full-scale commercial center with ambitions to become a central business district would benefit from professional planning assistance. Once again, this could be provided at no cost for the Provincial Planning Staff personnel are available to the municipality from Digos. If necessary, assistance could be requested from the Regional Development Council which operates jointly with the Regional Planning Divisions of the National Economic Development Authority.

The industrial prospects for future growth are contained in the potential of the livestock-and-poultry market. These include (but are not restricted to) the following:

(1) A feed production and marketing center.

A basic feed mill operating with local products (rice husk and upland corn) is a substantial addition to animal industries in the valley. But much more can be done if the demand for livestock and poultry justifies it. Economic advisors are aware of the need to stimulate production of specific feed grains throughout the Philippines (World Bank 1976: 141-143). Much of the land now in production of poor quality corn could be diverted to feed grain production of the market for it existed.

However, corn is grown as both a subsistence and cash crop. A substantial portion of each of the three crops grown during the year is consumed by the household. To replace these with feed grain would require that the household receive financing to purchase its cereal requirements. Since present corn production is soil-depleting and erosion promoting throughout the watersheds of Mindanao, the benefits derived from feed production could be substantial.

(2) Poultry and egg production.

The World Bank Country Report (1976) on the Philippine economy notes the trend toward vertical integration in the poultry and egg industry where increasing numbers of units are produced under contract to feed mills which also handle processing and marketing. The prospects for a feed mill described above could generate this valuable spin-off industry within a few years. At present, less than half of Davao City poultry consumption is produced by agribusiness firms on the outskirts of the metropolis (Barth 1982). There is also a tendency for these large scale operators to export to the Manila market whenever possible.

(3) Fertilizer distribution and vegetable production.

The livestock-and-poultry marketing center will generate substantial quantities of organic fertilizer. There is growing concern throughout irrigated rice producing areas that excessive dependence on commercial nitrogen and phosphates is creating a non-biodegradable threat to future soil fertility (Bello 1982: 81). While this may not be compensated by the natural output from the Bansalan facility, the organic fertilizer generated has an immediate application for vegetable production throughout the Valley.

A possible outgrowth of the livestock, poultry and egg operations would be an effort to improve upon and expand production of table vegetables for the Davao City market. The availability of fertilizer from the livestock enterprise would reduce

production costs for a better quality product than is presently available in the Davao City market. Here, once again, upland corn farms located at higher elevations are often much better suited for vegetable production but require a heavy investment in chemical fertilizer. This enterprise would be a great advantage to the group presently recognized as the lowest income component of the Valley's population. The slopes of Mt. Apo behind Bansalan would be ideal for this purpose; they are presently utilized successfully for coffee production.

The expansion of the livestock-and-poultry market to accommodate the vegetable trade would also exemplify normal evolutionary growth and diversification. However, heavy capitalization would probably be required. Vegetable sorting and packing would require appropriate workspace, water supply and refrigeration. It is possible that losses due to wilting and evaporation en route to market would need to be counteracted with refrigerated transportation. On the other hand, ordinary trucking is usable for bringing pigs and chickens to market.¹

(4) Meat and poultry processing.

The development of the livestock-and-poultry market to higher levels of industrialization depends entirely upon the pattern of demand, the supply side response and the revenues generated. If the growth is sufficiently accelerated, it should be possible to take advantage of one of the premises set forth in the World Bank study of rural growth and employment in Thailand (vide supra, pg. 56): manufacturing for distant markets can occur in rural environments if processing reduces either bulk or weight prior to shipment.

There are two options to be considered here with the experience gained concerning growth. The first is the possibility of a meat packing plant. A slaughterhouse and butchering facility would greatly reduce weight and increase value per kilogram of cargo shipped to market. A change in purchasing and distribution patterns would be required by this advance toward full industrialization. The level of capitalization and technology, likewise, would accelerate.

The second option to be considered is a meat processing plant for the manufacture of ham, sausage and meat products. At present there are no enterprises

1. Barth (1982) reports that Bankerohan Market in Davao City is a model of efficiency in processing butchered meat and poultry. With minimum refrigeration spoilage losses are no more than 1-2%. However, for vegetable and fruit dealers perishability is greater and losses due to spoilage average 10-15%.

of this sort outside Manila and its metropolitan environs. It is expected that both the quality and quantity of Valley livestock and poultry production would require upscaling prior to consideration of this option, which involves capital requirements greatly in excess of those for a packing plant.

(5) Upgrading quality and quantity of production.

The Davao City market for meat, poultry and eggs should expand at a 5% annual rate which is equal to population growth. Elasticity of demand for meat and poultry products is greater than for other food items; therefore, an increase in consumption per capita would be activated by an upturn in household income. To meet the predictable growth in quantity of consumption, and to anticipate the probability that the demand for improved quality will also materialize, it would be strategic to improve existing breeds of pigs and chickens.

The Bureau of Animal Industries operates its dispersal program for this purpose. Calves and piglets are distributed under contract with farm operators for raising, fattening and breeding. A poultry improvement project is also available. Repayment with interest is made to BAI at the time mature animals are sold. Animal dispersal is perceived by BAI as a way of upscaling backyard operations to commercial levels of output. The program does not provide credit, which explains its disuse by farmers in the Valley and elsewhere. It is to be expected that financing would be available from the livestock market bank to be created as part of the first-phase program. In fact, participation in the animal dispersal program would be a way for the bank to turn over its capital rapidly and effectively at a conspicuous rate of growth.

5. Steps toward rural industrialization.

In the microunban strategy proposed for the market town of Bansalan, the linkage of a transportation center with a livestock-and-poultry market is perceived as a catalyst to mobilize and expand pig and chicken production in the Valley. Agriculture, which was responsible for Green Revolution advances in the 1970s, remains the engine of growth. But the next stage of rural development responds to an urban stimulus provided in the form of linked and interacting services with a built-in capacity to generate growth from multiplier effects.

A linear projection of the evolution of the initial projects, the terminal and market, to higher order development over time was sketched in the preceding

section. In outlining the commercial-industrial center for Bansalan which could emerge if justified by regional demand for its basic products, it was suggested that a central business district incorporating collateral enterprises was also a downstream possibility. It is the purpose of the present section to indicate the nature of these horizontal extensions of the linear growth model.

a. Basic rural-oriented industries.

The expansion of animal production within the Digos-Padada Valley, together with the diversification of crop production already in progress, should stimulate the formation of enterprises catering to the expanding local market. However, the competition from Davao City, from which substantial market penetration already exists, must be taken into account in predicting the viability of specific undertakings. Prospective entrepreneurs should be guided by the premises specified in pp. 55-57, "Assumptions guiding microurbanization".

It may be remembered that bulky or heavy consumer goods intended for the local (Digos-Padada Valley) market may have a cost advantage if produced near the point of sale. There are several obvious candidates for small scale industry to be located in Bansalan which conform to this criterion. These discussed below will reinforce and interact with the transport terminal and livestock market complex.

(1) Machine shop for farm equipment and vehicle repair.

The Valley has a profusion of mechanics operating backyard repair shops. Ever since World War II required the training of a substantial number of Filipinos in vehicle maintenance, skills have been transmitted and improved. The problem is parts. All developing countries acquire a heterogeneous collection of vehicles of all ages and ancestries which defeats efforts to maintain parts inventories outside the largest cities. When a vehicle breaks down, it is customary to make a replacement part if at all possible one rather than order one; comparative costs also favor the machine shop solution.

A number of these enterprises, offering a range of specialized services (for logging equipment, plantation vehicles, hand tractors and tillers, etc.) are now in business in Davao City. The transport terminal would gain in revenue and also in traffic if the community also boasted a truck and bus repair facility which could accept farm machinery at the same time. The equipment needed to set up a machine shop is available in Manila; skilled personnel could be obtained locally to operate it. Credit would probably be necessary for both shop construction and equipment.

(2) Sheet metal work, tinsmith and welding.

Livestock and poultry operations require water tanks, sun deflectors, rain shelters and similar facilities. These are usually made from sheet metal---most often galvanized iron. The same material, known throughout the region as "G.I. sheets", is use for roofing on all but lower income dwellings which continue to employ thatch made from buri palm. Also important is its use to construct water tanks which provide supplies of domestic water obtained by draining the run-off from metal roofs throughout the Valley.

A shop-warehouse combination is needed to maintain an inventory of tin, galvanized iron, copper pipe (and its modern plastic substitutes), and the hand tools needed for welding, soldering and bonding these materials. Since sheet metal and welding operations are frequently needed in connection with farm machinery, truck and bus repair, this shop would provide many services to augment and supplement the machine shop described in (1) above. Materials are available in Davao City.

(3) Sawmill and construction materials warehouse.

Agricultural development has already provided substantial increments of personal income distributed among Valley households. This in turn has promoted advances in home construction, expansion and improvement. Most of the materials for this purpose have been trucked in from Digos or Davao City and costs are prohibitive. The transport cost is greater than the value of the materials in most cases. Much of the lumber consumed is processed from trees which are cut in timber concessions located adjacent to the Valley and hauled to Davao City sawmills.

Many advantages could be obtained from a sawmill and construction materials complex located in Bansalan which would also make concrete block to order for home improvement. Construction grades of steel, glass for louvres and related aluminum fittings, basic kitchen and bathroom plumbing fixtures should be stocked in addition to lumber and concrete. Roofing materials would be available from the sheet metal shop described in (2) above. Timber is available locally and cement can be purchased from the Bacnotan plant in Davao City---one of the major exporters to the rest of the Philippines. Because substantial capital is tied up in inventory, a credit advance and suitable warehouse construction would also be needed to start up an enterprise of this type.

b. Mini-industrial park.

The three small and medium enterprises described could develop a number of interdependencies. To encourage these, it would be helpful to establish spatial

contiguity between them. Locating all three enterprises in a small industrial park is a deliberate move toward creating implicit multipliers. Furthermore, it provides for use of a common set of utility installations (water, power, sewer) and infrastructure (highway access, drainage, site preparation).

The notion of an industrial park conveys some possible misapprehensions which should be set aside. The concept we have in mind is simply that of (1) a serviced site, (2) located as close to the terminal-market complex as possible. We are not advising a cluster of factory buildings constructed in advance and used to attract prospective investors on a turnkey basis. We are not advocating concrete foundations, paving, curbing, or other improvements which raise costs without contributing to efficiency. We do not believe that the site should be larger than known users will require (no more than 3 to 5 small industries). The attempt to create large industrial parks to accommodate as many future (but at present unknown) users as possible drives the choice of sites to remote areas where sufficient land can be obtained at a low price. This decision, in turn, drives up the price of utilities, transportation and everything else to be used by the potential investors.

c. Downstream manufacturing developments.

The interplay between the transport terminal and livestock-and-poultry market was envisioned as possibly expanding into a commercial center which would stimulate formation of a central business district. The small scale enterprises to be located within the mini-industrial park possess similar potentials. Each of them assumes the possibility of drawing on several of the three industrial park candidates described above. Since downstream industries must wait for the basic small industries to establish themselves, they are second generation for this community.

The downstream industries differ from the basic set in that (1) they require much more investment of labor; (2) will generate more highly skilled jobs, and (3) will produce finished goods selling at higher prices per unit. The manufactures to be described below clearly fall within the definition of modern industrial production. They include the following.

(1) Home construction.

If the microurbanization process outlined in this prescription for development is successful, it will promote significant population growth. In fact, it is intended to channel rural-to-urban population movement toward Bansalan, off the farm and away from Davao City. The types of entrepreneurship, managerial and skilled

employees to be secured are to be retained as residents. At the same time, the design of the livestock/poultry market requires the participation of technical and financial personnel who will be both government and private sector (bank) employees.

The World Bank (1982) analysis of private housing finance in the Philippines describes programs available for both government and formal sector employees under Government Services Insurance System (GSIS) and Social Security System (SSS) auspices. Households belonging to neither may be covered under the Bagong Lipunan Improved Site and Services (BLISS) program initiated by the Ministry of Human Settlements in 1981. The effort to expand the scope of housing finance through work with locally incorporated builders, cooperatives for home construction, and the like is well-known.¹

The presence of a lumber and building materials warehouse and a sheet metal enterprise provides the requirements for building contractors to undertake home construction with financing provided under one or more of these programs. Entrepreneurs in this area will find an abundant resource of carpentry and masonry skills among the farm population of the Valley. Craftsmen and artisans skilled in cabinet-making, cement-finishing, electrical work and plumbing are also available; the supply of personnel in these areas has always exceeded the demand in recent years, primarily because of the slowdown in subdivision openings and commercial construction in Davao City.

While middle and lower income households in Bansalan and surrounding farm communities have always invested substantial amounts of household labor in home construction, their level of aspiration now extends beyond these simple accommodations. For those who still favor the site-and-services minimum to be provided by builders a home construction enterprise could still provide prefabricated panels, precut lumber and other materials in do-it-yourself kit form together with plans for assemblage. Technical work would still be performed by specialists: masons, electricians, etc.

The commercial enterprises which are expected to grow as the business district expands should also require the services of a construction firm. The proprietors of these, together with professional and technical personnel relocating to Bansalan, may generate business sufficient to warrant the planning of one or more residential subdivisions. Improved shelter solutions to the needs in villages and towns of the

1. Davao Development Foundation (DDF), an affiliate of Davao Research and Planning Foundation, has been in the low-income housing market in Davao City since 1970. It has secured government financing for DDF Village, a low-income subdivision located in the suburb of Mandug. It could serve as a prototype for the addition of home construction to the microunurbanization process in Bansalan.

Valley have suffered in the past from three basic deficiencies: financing, building materials and design and workmanship. The evolving microuurbanization process in Bansalan could provide all three.

(2) Farm implement production.

The International Rice Research Institute at the Los Banos campus of the University of the Philippines has been responsible for the introduction of the seed- and fertilizer revolution throughout the Philippines. It has also provided designs for prototype models of farm implements to be used in connection with other elements of Green Revolution technology. Thus far, these are not being produced in the Mindanao region. However, a substantial market has emerged in the Digos-Padada Valley which is now being served exclusively from Davao City.

The presence of a machine shop and sheet metal works makes it possible for entrepreneurs to attempt to construct and market implements adapted to local conditions; and example of a machine which has proven successful elsewhere but is not now used in the Valley is the power tiller (IRRI 1978).

(3) Furniture manufacture.

The home construction business generated by an expanding population provides the opportunity to market home furnishings as well. Once again, the undertaking becomes feasible only when a sawmill and machine shop are available. The abundance of furniture-grade hardwoods in the area suggests that this type of manufacturing, once begun on a small scale, could expand beyond the Valley to a wider market. There are no mass-produced furniture makers operating anywhere in the Philippines at present. All quality work is done by craftsmen to custom order in larger cities. This restricts their market to upper income households and formal sector or government enterprises.

d. Technical and financial resources for industrialization.

Industry is a self-generating phenomenon in environments where the necessary prerequisites (technology, capital, raw materials, experienced management) can be fused with effective demand. In Davao del Sur, the capital and management experience are lacking even though entrepreneurship at a more basic level is abundant. To navigate the transition from agricultural processing to rural industrialization as outlined above, additional assistance will be needed. Fortunately, both technical and financial support are available.

(1) Technical assistance for industrial development.

Within the Ministry of Trade and Industry, the Bureau of Small and Medium Industry (BSMI) has the responsibility for promotion of small scale industrialization. The instruments for working toward this objective are the Small Business Advisory Centers (SBAC) which are established in all twelve regions outside Metro Manila. The SBACs were the result of World Bank support provided for this purpose in 1975. Their intent is to provide field assistance to prospective entrepreneurs seeking entry into a particular field of business or industry. SBAC assistance includes a project study which incorporates (1) estimated demand for the product in the regional market; (2) technical specifications for manufacturing the item; (3) estimated set-up costs for equipment, raw materials, building space, payroll, etc., (4) first-year budget including estimated cash flow; (5) loan requirement to begin production.

The foregoing outline of a feasibility study for a particular enterprise will be made for an entrepreneur without charge. The completed study is frequently presented together with a loan application to obtain credit from government agency (see below). However, SBAC also undertakes studies of particular industries as requested by BSMI to detect strengths and weaknesses within each of the twelve regions. The industries studied are usually those assumed to have some export potential, e.g., textiles. Technical assistance from the SBAC Davao City office could be made available to prospective entrepreneurs in Bansalan interested in home construction, farm implements or furniture making (SBAC does not engage in agricultural enterprises).

(2) Financial assistance for rural industries.

Major funding for industrial development projects in the Philippines has come from the World Bank. Currently, the third loan for this purpose (\$132.0 million) was released in June, 1982. It earmarks \$7.0 million for small and medium enterprise pilot projects. The U. S. Agency for International Development in August, 1983, completed negotiations for a \$20.0 million loan intended to provide additional support to small and medium enterprises. USAID funding is to be dispensed through business associations and other private sector channels. A number of other smaller sources of pump-priming funds are available to initiate rural industries in the Digos-Padada Valley. These examples should be sufficient to confirm that neither new expenditures nor additional technical assistance will be required for projects recommended in this section.

6. Continuing research requirements for agriculture and industry.

The tendency of seed-and-fertilizer agriculture to threaten both itself and its environment through destabilization has been described above (vide supra p. 46). This may take place through over-cultivation of soil nutrient consuming crops. It may also occur through excessive reliance on a single crop in a national and global market situation in which both price and demand are uncertain from year to year. Concluding statements concerning the status of the Green Revolution in the Digos-Padada Valley going into the 1980s indicated that artificial credit conditions, input availability and market prices had been provided to promote national rice self-sufficiency during the 1980's.

It is quite uncertain whether the Valley farm operators will duplicate their 1970-1979 success during the present decade. If they succeed again, it will be because of their implicit comprehension of the cybernetic principle that stability, when making exploitative use of the environment, can only be maintained through changing the technology employed. The change may take the form of crop diversification, a shift from chemical to organic fertilizers, a movement toward production of feed crops combined with cattle feeding, or some combination (perhaps rotation) of these options.

In any case, it seems clear at this point that continued success with agriculture in the Valley requires adherence to Binswanger and Ruttan's (1977) advice to conduct research on a continuing basis within the context of the microenvironment. Research conducted at the International Rice Research Institute in Laguna, in other words, will not meet the requirements of environmental change under intensive cropping in Mindanao. There are two linked solutions to the maintenance of agricultural productivity, and a third for the related issue of sustaining the finances necessary for evolutionary growth to continue.

a. An agricultural experiment station.

While the Philippines has accepted most forms of government administration installed by the American colonial regime, such as the agricultural extension service and the agricultural college, it operates no experiment stations. Because of the current need to mobilize farm productivity and redeploy agricultural resources with great rapidity in response to changing world markets, a continuing research program on the entire range of soil, moisture and altitude configurations encountered within the Valley is essential.

Among the issues to be investigated and resolved by a permanent agricultural experiment station are the following:

(1) Increasing and maintaining yields.

It is estimated (IRRI 1978) that a yield of 100 cavans per hectare, the target for the "Masagana 99" agricultural credit program, represents only one-third to one-fourth of the potential yield of the new HYVs. The resulting "yield gap" between actual and potential production can be partially closed by research specific to the microenvironments in which irrigated rice is produced. The prospective returns from local studies were demonstrated by the International Rice Research Institute (1979).

(2) Alternative inputs.

New hybrids of seed may be required and variations in the formulae for fertilizers and chemical pesticides may also be needed to sustain yields over time at present levels. Heavy residues of non-biodegradable inputs may lead to such well-known problems as "nitrogen burn". The tolerance of local soils and the effectiveness of substitutes must be tested on experimental plots.

(3) Watershed monitoring.

Irrigation in the Valley, as in most of the Philippines, depends on diversion of surface flow from the mainstream of a river, in this case, the Balatukan (see Map #4). The reliability and stability of the water supply for crop production depends upon the condition of the watershed. Later arrivals among the homesteaders have cleared and cultivated the steepest hillsides for their corn fields. The impact of this utilization pattern on runoff, erosion, silting and flooding should be continuously monitored. Evidence of considerable damage already exists.

(4) Irrigation efficiency.

While the Balatukan was originally harnessed by a cooperative irrigation organization, control was passed to the National Irrigation Authority in 1979 in exchange for construction of a permanent dam and concrete lining of the main canal. Changes in water distribution resulting should be evaluated, as should the efficiency with which irrigators at different positions on the system are being served. A field study comparing the Badagoy Irrigation Association fields with those served by an adjacent system operated by the NIA was reported by Hackenberg (1984). The cooperative system was a much more efficient distributor, equalizing the flow to consumers at all points on the system. Farmers at the lower end of the NIA system were frequently unable to harvest more than half the area planted.

Studies conducted by the International Rice Research Institute (Wickham, Barker and Rosegrant 1978) indicate that controlled irrigation, interacting with appropriate applications of nitrogen fertilizer, are the most important determinants of HYV performance. It is seldom appreciated by those who have not observed them in operation over time, but irrigation systems have a life cycle; they are at peak efficiency when placed in operation, stabilize at a lower level of efficiency upon reaching maturity, and then rapidly decline. The duration of the "mature phase" can be greatly prolonged with appropriate management.

(5) Cropping pattern.

Very substantial long term yield increases can be secured by manipulating two dimensions of the cropping pattern. The first, recently reported by Gomez and Gomez (1983), advises on the advantages of intercropping upland vegetables in rice paddies during the dry season to conserve water, restore soil nitrogen and supplement income. This innovation, thus far untried in the Valley, is consonant with earlier discussion of the possibilities for vegetable growing with organic fertilizer for the Davao City trade.

The second concern regarding cropping pattern deals with advantages to be derived by uniform planting and irrigating schedules to be adhered to by all farmers receiving water from a single source. Distributive efficiencies gained in the use of water are alleged to greatly improve yields. A field test of this hypothesis was conducted and reported in Hackenberg (1984). There is merit to this notion but it needs to be considered in combination with the other determinants suggested for agricultural experiment station inquiry above.

(6) Cost-effective operating strategy.

The concept of an agricultural experiment station must not be equated with buying and operating a large farm with expensive equipment and a cohort of doctoral level scientists. HYV seeds were first perfected for Mindanao by distributing them to contract-farmers to plant and reproduce. Fertilizer dealers gather data on the consequences of various mixtures and application schedules by utilizing contract-farmers and monitoring their performance.

Devising appropriate experiments and contracting with farm operators to participate in them is the proper way to operate an experiment station. The key ingredients are time and effective measurement (which includes record-keeping). An office in Magsaysay poblacion staffed by Bureau of Agricultural Economics (BAECON) and

Bureau of Agricultural Extension (BAEX) agents should be adequate for the needs described. The experiments could be designed by University of the Philippines, Los Banos faculty members. It is not widely known but many of the BAEX and BAECON technicians are also farm operators within the Valley "on the side". It might be practical to construct an experimental farm from test plots located on their holdings.

b. A rural technology center.

Binswanger and Ruttan (1977) observe that substantial production gains can be achieved by adapting farm implements to local operating conditions. They argue, in fact, that local farm implement production is desirable because of the peculiarities of microenvironments. If local implements could be designed and tested at a suitable facility located within the Valley for a wide range of crops and conditions, then they could be manufactured in Bansalan by the basic industries (machine shop and sheet metal works) described in the previous section. Participation of the rural technology center was envisioned in the speculation concerning a possible farm implement factory (vide supra, pg. 73).

A major assignment of the rural technology center would be to design and experiment with alternative solutions to the problems of irrigation under different locations and terrain conditions. Pump irrigation has been widely diffused throughout other regions of the Philippines by the Farm Systems Development Corporation (FSDC), a component of the Ministry of Human Settlements. It could be introduced on the "compact farm" principle, which groups a number of small holders into a single operating unit to share irrigation, equipment and technology (Castillo 1983: 121-125). The Israeli system of drip irrigation, now successfully introduced for orchard crop production in South Cotabato, could also be experimentally introduced at the technology center.

If the center is successful in designing implements, machines and irrigation technology that improves production economically, the products could be manufactured and sold from Bansalan throughout Southern Mindanao. A surcharge could be collected and returned to the technology center to defray its operating costs. Agricultural engineers in the employ of the National Irrigation Administration (NIA), FSDC, and IRRI might be able to participate in this venture at no additional cost.

c. A rural financial laboratory.

Cost recovery for investments required to initiate microunurbanization is imperative. Beyond that, the process cannot be sustained without self-financing. The

most imperative original research and development activity required by the program outlined in this essay is to determine the potential for savings and the readiness to save among the beneficiary population. Finally, the type of institution(s) which would be most effective to accomplish these purposes must be established.

The recent World Bank publication (Von Pischke, Adams and Donald 1983) presents a variety of alternatives which might be tested in the setting of Southern Mindanao. These include programs initiated by rural banks, savings through mutual aid societies or cooperatives, contractual agreements with sources of credit, deductions made from fees for services collected by government agencies and credited to the payee's account, etc. The most obvious source for mobilizing savings, the rural banks, are already in disfavor because of their unsavory performance during the "Masagana 99" program. A variety of options need to be investigated and field tested.

It is probable that the combination of savings with lending capacity, offering the combination of relatively high returns on savings and relatively low interest on loans, would achieve the goals intended here. The Samahang Nayon (Castillo 1983: 15-115) or compulsory cooperative organization incorporating land reform participants, exemplifies a first approximation of what is intended by this discussion. The SN savings component was initially established (1) to provide a fund against which farm operators could borrow to finance their own crop loans and (2) to generate reserves which could be used to make the amortization payments of former tenants redeeming their land from the owners.

Castillo (1983: 16) observes:

"Two types of savings were instituted. One is the Barrio Savings Fund (BSF) which would come from farmers who borrow from financial institutions such as the rural bank...through the 5% deducted upon release of their loan and deposited in the fund... For members who do not borrow a monthly savings of ₱5.00 is required....The other is the Barrio Guaranty Fund (BGF) which will be built from members contributions of one cavan per hectare per season. The fund is intended to guaranty land amortizations of tenants who are paying for their land."

Between 1974 and 1979, the SN accumulated deposits of almost ₱100 million nationwide. These amounts came from a total of 18,180 SN units with a registered membership of 933,536. Although the grand total is impressive, Castillo (1983: 81) notes that there has been a downward trend in collections during the decade, and that the relationship of SNs with rural banks has not been constructive. The experience serves to illustrate the potential for generating rural savings, however.

7. A balance sheet on microuurbanization.

The dominant theoretical linkage between the sections of this piece is derived from a cybernetic perspective. Growth within a system creates imbalance between the system and its environment. Treatment of either the system or its environment to restore balance increases the level of human control over both and permits growth to continue. The consequent of further growth, however, is a second condition of imbalance, probably more "basic" than the first. For example, agriculture consumes soil nutrients, creating imbalance; utilization of chemical nitrogen permits agriculture to restore itself and increase yields. The consequence is twofold: depletion of irrigation water reserves and lethal concentrations of chemical residues. This results, inevitably, in assumption of control over soil chemistry and watershed management by public agencies.

We have described this process as it unfolds in the Digos-Padada with the result predicted: gradually increasing control of the environment and its human communities by a loosely coordinated network of public agencies. Microuurbanization has been introduced as a purposive mechanism for increasing the efficiency and reducing the cost of this coordination. Specifically, we have sought to strengthen the spatial linkages between private sector business activities being conducted in both farm village and market town and government support services available from existing agencies. These linkages represent implicit multipliers which will accomplish self-sustained growth.

A two-stage process has been conceptualized to incorporate microuurbanization into the economic life of the Valley. The first stage is summarized in Fig. 2 opposite, entitled "Microuurbanization I, Sustaining the Green Revolution". It describes a conventional set of deviation amplifying relationships between the farm villages of Magsaysay and Matanao and the market town of Bansalan. It operates in a continuous upward spiral of expanding productivity.

By establishing a market, the town generates demand for farm products. But, since the causal links are reciprocal, expanded agricultural activity requires the market itself to increase its capacity---perhaps to reorganize at a higher level of operation offering expanded services. Growth will continue until further farm production is inhibited by (1) environmental depletion, or (2) market saturation, or both. However, when either limit is reached, the accumulated support should permit

Figure #2

MICROURBANIZATION I:

Sustaining the Green Revolution

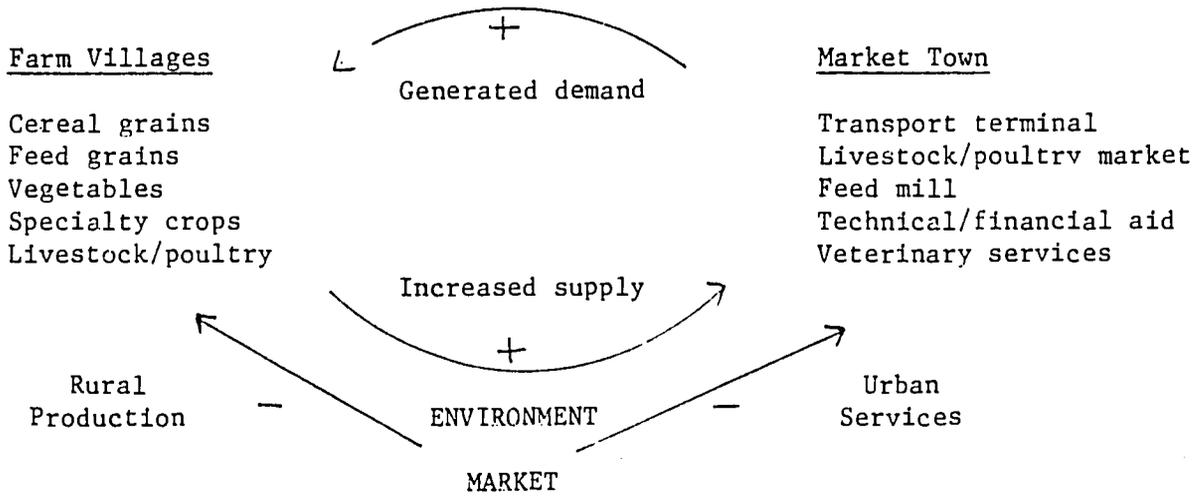
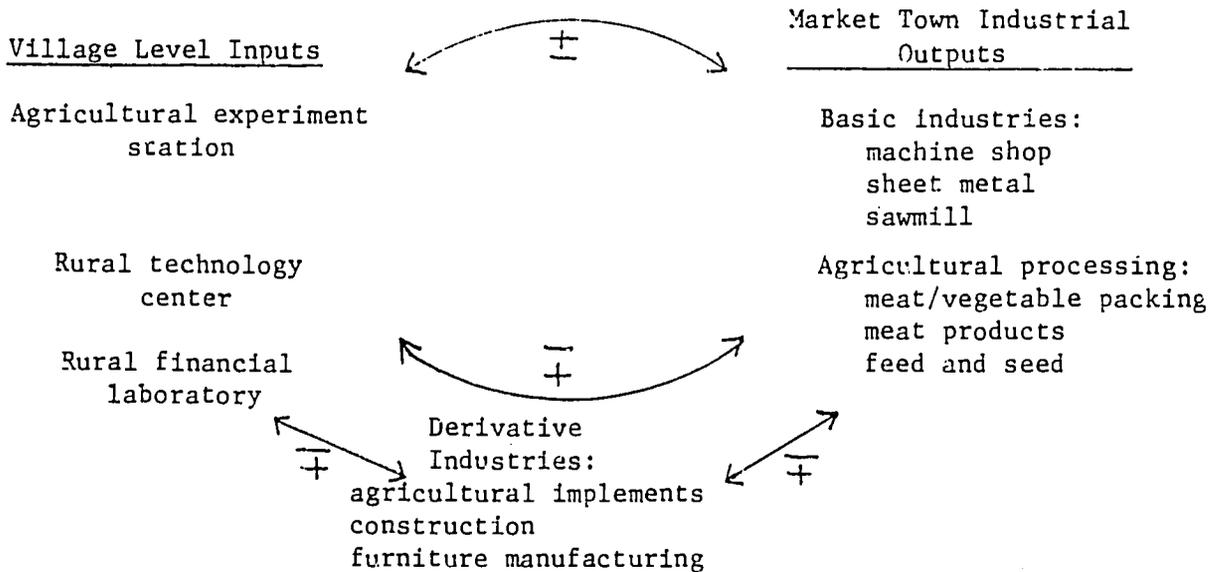


Figure #3

MICROURBANIZATION II:

Inducing Urban Industry



advancement into both basic and specialized industries (see Fig. 3). The unmet need for jobs and the absence of further investment opportunities in traditional areas leads to industrialization: this is the consequence of creative imbalance.

The Green Revolution, as described in Fig. 2 is sustained by vertical integration of both spatial and institutional elements of the regional economy which were previously disconnected. The village level production of women is channeled through a traditional informal sector market in Bansalan to become linked with the modern (formal sector) sale of livestock, poultry and vegetables at Bankerohan Market in Davao City, from which they reach the consumer---an urban household.

The outputs from the first stage relationships described in Fig. 2 include the following:

- a. Increasing quantity of products reaching the market in Davao City.
- b. Improved quality of products commanding higher prices.
- c. Savings generated contribute to business expansion.
- d. Increased employment in rural non-farm occupations is related to production and marketing of livestock, poultry and vegetables.

These gains are achieved with more efficient use of the factors already present in the agricultural economy of the Valley.

The second stage of development, summarized in Fig. 3, is intended to overcome both types of constraints which impinge on further growth in Fig. 2. The scientific and technical inputs at farm level resolve environmental limits on agricultural productivity. At the same time, an expansion of market town outputs has a dual impact: (1) sales to the metropolitan market are diversified, removing the limit in volume by expanding variety; (2) sales to local markets within the Valley and adjacent communities are also expanded.

An important modification in the structure of the rural factor markets takes place at this time. The clarity of separation between town and country disappears.

Changes may be summarized as follows:

- a. Before, farm owner-operators were producers while townsmen were entrepreneurs trading in their output. Now, each tends to penetrate the sphere of the other. Successful traders in Bansalan seek to become producers by acquiring farm land. Conversely, farm operators with accumulated savings will tend to invest in town enterprises, thus becoming entrepreneurs. Both the capital and land markets are affected by this interpenetration.
- b. Before, farm and town labor pools were discrete and each was employed in a distinct economic sphere: farm production vs. trade in farm commodities. Now, part-time farmers can also be part-time wage workers or businessmen in the expanded sphere of interlocking town and country enterprises.

The removal of boundaries between town and country with reference to land, labor and capital eliminates the fragmentation which previously characterized these markets. The constraints on production and sale are no longer interposed by exogenous variables: the environment and the absorptive capacity of the Davao City market. Instead supply and demand forces are mutually adjustive and capable of fine tuning within the framework of a single expanded network of factor markets.

This rather opaque statement can be clarified with some illustrations. The agricultural experiment station, rural financial laboratory and agricultural processing industries form a triangle of interlocking links which are mutually modifying. The experiment station will be challenged to produce varieties of vegetables or poultry which are most suitable for processing or packing. The availability of capital will determine the level of technology which may be introduced for this purpose. The variety of products emanating from the processing plants in turn will play a role in determining the size of the market for goods produced in the Valley.

Also, the rural technical center forms a similar triangle with the basic industries group and the manufacture of agricultural implements. The technical center will be challenged to produce implements and technology suitable for improving varieties of cereals, vegetables, livestock and poultry. In doing so, it will be limited by the capacity of basic industries to produce the components and of the agricultural implements shops to assemble and market the equipment designed.

Sets of considerations put forth in these triangular relationships indicate both the sources of economic growth to be encountered within the Valley's expanded and diversified productivity, and also the limitations or "thermostatic controls" which will regulate its pace and volume.

As with Fig. 2, the second stage model also has a set of outputs. Some of these are amplifications of those previously mentioned, while others are specific to this higher stage of economic development:

- a. Manufacturing of a range of food products, buildings, technology and household goods for local consumption and also for export.
- b. Diversifying the range of private sector enterprises, while increasing their size and numbers.
- c. Augmenting the capacity to generate savings.
- d. Providing crop loans from locally generated savings.
- e. Offering skilled non-farm employment in market town industry, thus completing the triad of occupational types designated by Oshima (1971: 170; vide supra, pp. 8-9) which must be interlocked to provide both employment growth and job security.

f. Innovating crops, production methods and new technology.

The discussion has focused on empirical building blocks from which a larger economic structure can be created which will achieve spatial integration of town and countryside in a comprehensive growth machine. But it is not devoid of theoretical significance. Administrators who have kept in touch with the literature produced by professionals have declared themselves in sympathy with an approach to regional development goals based on selective regional closure.

But they have followed their affirmation with the criticism that they have been provided with neither specific guidelines for accomplishing it nor examples of situations in which it could be made to work. This essay has attempted to demonstrate that selective regional closure can be established through a microunban policy. Furthermore, it has outlined a step-by-step sequence of interventions using policy instruments already at hand to achieve this goal.

D. Closing the Region by Connecting Implicit Multipliers

Economic growth may be either natural or induced. Induced growth results from development policies translated into projects. An assumption underlying the case study presented here is that induced growth functions most effectively as an extension of, or supplement to, natural growth which was established in the Valley by pioneering. The natural process would have terminated in involution, subdivision and poverty in subsequent generations without intervention to sustain and amplify it. Evidence of decline was encountered toward the end of the 1960s.

The first phase of intervention consisted of the policies and projects underlying the Green Revolution which succeeded in substituting yield increases for the previous pattern of area expansion. This solution succeeded in maintaining the momentum of growth throughout the Valley for the next decade or two. At present, there is evidence that the adverse consequences of intensive monocropping observed by DeKonincke (1979) in Malaysia may be gaining ground.

These can be countered effectively by the second phase of intervention represented by microunbanization. One of the significant achievements of the seed-and-fertilizer revolution was to bolster the position of the smallholder to make him competitive within a capitalist mode of production. He required this protection and support much as the American family farm requires subsidized credit, price supports and technical assistance to remain competitive with agribusiness.¹

1. In the U.S. it is fair to query further need for such support since family farms and their residents could be readily absorbed by other sectors of the economy. In developing countries with 40-60% of the population dependent on this sector of the economy there is no alternative to keeping it competitive in the short run.

In the preceding section, the intention was to present a case for micro-urbanization as a possible solution. In this concluding discussion, it will be argued that it is also a practical one. The advantages inherent in this proposal include each of the following:

1. Microurbanization attains the goal of selective regional closure advocated by regional scientists without requiring the comprehensive intervention strategies which they have proposed.
2. Microurbanization also achieves the regional development objectives identified as highest priorities by aid administrators and indigenous ministry officials and economic planners.
3. Microurbanization relies heavily upon field level personnel which are already in place, and utilizes budget resources which are already committed.
4. Microurbanization anticipates, and creates the foundation for, some innovative policy initiatives which will carry the process beyond the limits of the present discussion by raising selective regional closure to a higher level of implementation.

A brief section will be allocated to each of these propositions to complete the presentation.

1. Microurbanization and selective regional closure.

Selective regional closure is a strategy which seeks to retain profits generated within a region for local reinvestment, thus permitting the indigenous population to benefit from the exploitation of its own resource base. At the same time, it advocates development of local production to provide for regional demand. The goal is to increase linkage between economic components within the region while minimizing leakage of profits and purchasing power to the capital city and its administrative-financial-industrial complex.

Specific objectives which equate with the linkage concept were also described as goals of microurbanization (vide supra, p. 51) which are shared by economic planners within government ministries. These same objectives, phrased in more academic terminology, have been advocated by a host of regional scientists in recent years (vide supra, p. 12), who have indicated a preference for regional closure over growth pole strategies, peripheral industrialization, etc.

Two perspectives intended to achieve selective regional closure have been provided in the form of integrated area development (Rondinelli 1984, Rondinelli and Ruddle 1978) and the agropolitan strategy (Friedmann 1981; Friedmann and Douglass 1978).

There are others of course, but these two have drawn the most frequent comment in the recent literature. A brief reference to each will serve to indicate ways in which they differ from the microubanization process.

Rondinelli and Ruddle (1978) argue for the need to organize space into a system of settlements linking the farming area with the metropolis through a graded community hierarchy. They identify services which must be provided at each level of settlement from highest to lowest, and also propose essential infrastructure to provide a platform on which the communities are to be erected. A reflection of this perspective is contained in the quote (Rondinelli 1984: 14) at the beginning of this discussion (vide supra p. 1).

The argument is carefully constructed and the viewpoint presented is comprehensive. Because of its inclusiveness, however, it is also labyrinthine as a plan of action. The authors themselves observe:

"This review...highlights the enormous variety and complexity of components needed to put a self-sustaining strategy into operation. A myriad of functions and services must be provided by public and private organizations at the national, regional and community levels. Strong support must come from the national government.../for/...agricultural productivity and redistributing income and wealth. In addition to delivering an integrated package of technical inputs, projects must also enhance the capacity of rural communities to sustain social and economic transformation" (Rondinelli and Ruddle 1978: 177).

While endorsing the objectives, Hansen (1982) observes that if developing countries could implement the Rondinelli and Ruddle agenda, then they wouldn't be developing countries.

In addition to the requirement that vast resources be available for investment, the Rondinelli-Ruddle model appears to require that total control be exercised from the center over the region in order to coordinate all phases of the plan. The totalitarian regimes capable of accomplishing this (Tanzania, Burma, Nicaragua) may be unable to obtain the financial assistance from multilateral lenders, since the latter tend to favor regimes supporting private sector involvement and market processes.

In his earliest statement of the agropolitan strategy, John Friedmann (Friedmann and Douglass 1978: 183) announces goals which closely resemble those we have asserted for microubanization (vide supra, p. 51). His concept of the agropolis (city-in-the field) is a small (50,000 pop. or less) self-governing area in which local democracy and the political decision-making process are employed to attain

them. In his most recent statement, the emphasis on territoriality, political segmentation and autonomy is even stronger:

"It used to be thought that political organization, territorialism, and local self-governance were merely ideological issues, questions in political philosophy that could be debated at leisure. This point of view is now in dispute. In opposition I would maintain that rural development...cannot be accomplished in any other way" (Friedmann 1981: 261),

We are indebted to Friedmann for the selective regional closure concept, and remain in agreement on its objectives. But we cannot accept his methodological prescription.¹ One would not advise "solving" the economic development problems of modern Greece by reinstating city-states. Rondinelli, Nellis and Cheema (1983) provide a comprehensive assessment of efforts at decentralized development of this sort. While they support the principle and note the universal concurrence among planners in favor of it, they fail to find supporting evidence.

Friedmann's idealism is appealing in this jaded decade. However, Rondinelli and Ruddle have the best of the argument. They win on a technical knock-out in the early rounds. All the technical aspects of planning and the implementation essentials are spelled out in their argument logically and convincingly. But the scale of intervention required appears to be that of Gezira in the Sudan, Mahaweli in Sri Lanka, or Muda in Malaysia.

There is nothing wrong with this if a developing country and its planners are in a position to mobilize the resources and the political will, and follow through on the commitment over several decades. The theme of this paper, however, is that development projects on this heroic scale are probably artifacts of decades past. Like the Lower Mekong Basin scheme, they will most likely remain on the drawing board in the future.

Like integrated area development and the agropolitan strategy, microubanization seeks to stimulate economic growth based on agriculture within a bounded territory. However, it relies upon existing administrative machinery and infrastructure investments installed to generate Green Revolution gains. Upon this base, it will construct a second tier of private enterprises rather than another layer of public agencies. While it depends upon market processes, it does not rely upon decentralized local political entities.

1. In an intervening publication (Friedmann and Weaver 1979: 195) a new formulation of the "basic conditions" for agropolitan development stated which include (a) selective territorial closure; (b) communalization of productive wealth, and (c) equalization of access to social power. This formulation is less practical than those discussed here.

2. Microurbanization and regional development objectives.

Within the Digos-Padada Valley, the seed-and-fertilizer revolution was instrumental in producing the foundation for selective regional closure by removing barriers which had resulted in the existence of fragmented markets in land, labor and capital (vide supra, pp. 39-40). Other specific gains (vide supra, p. 48) representing advances toward selective regional closure were the following:

- a. reinvestment of savings and profits in expanded farm operations;
- b. upgrading the quality of the labor force through education;
- c. movement of labor into wage work and commerce;
- d. rapid expansion of personal and household income;
- e. growth of private professional and technical support;
- f. proliferation of policy-implementing public agencies (land reform, credit, agricultural extension, cooperatives).

These gains set the stage for the next level of development which will sustain these achievements while expanding and diversifying the economy. Ever since the ILO report prepared by Gustav Ranis and associates (Ranis 1974), the goals identified have been shared by development agencies, government ministries and regional scientists:

- a. expansion of private sector enterprises in size, number and variety based on agricultural processing operations;
- b. stimulation of agricultural productivity by opening new markets as a result of processing which creates new products;
- c. generating employment in both farm and non-farm areas as a result of a-b above;
- d. establishing a vigorous rural financial market to provide financing for expansion of both agricultural productivity and private sector enterprises.

These goals were spelled out at the beginning of the present section (vide supra p. 51) as those of microurbanization, viewed from the perspective of national development.¹

The evolving pattern of commercial, industrial and agricultural activities of which microurbanization consists, described in Figs. 2-3 and accompanying text, provides for these objectives, which are perceived by all as an essential interface between the present commitment of the bulk of the labor force to semi-subsistence agriculture and the eventual goal of full-scale industrialization for both export and domestic consumption.

1. Raised to one higher level of generalization, these goals may be subsumed within the statement of planning aims for secondary cities with which the essay began (vide supra, p. 1). The intent here is to imply that an implemented policy of selective regional closure in resource frontier areas will serve as an engine to initiate a train of growth spurts with impact on the entire economy. For development of this argument in the Philippine case see Hackenberg (1982). For a statement of the general case see Hansen (1982).

To successfully navigate this transition, economic improvements must take place simultaneously at two levels: that of the household and that of the region in which it is located. To assert this is to repeat one of the oldest premises of social anthropology: to persist within a system, an institution must be both adjustive for the individual and adaptive for the society. Microurbanization is adjustive from the point of view of the household because it generates the additional jobs needed to complete the triad described in Figure #1 (vide supra, p. 11); it provides wage work in industrial enterprises located within commuting distance of the farm so that agricultural work, informal sector marketing, and factory work may be combined. This will provide both income supplements and income security to the individual household.

From the point of view of the region, microurbanization is adaptive because it utilizes the profits and savings derived from agriculture to take the first step toward industrialization. But it accomplishes more than that. Using a "bottom up" approach to the establishment of an improved distribution of settlements by size, microurbanization should help to remedy the lack of intermediate cities stated at the beginning of the discussion (vide supra, p. 1). Furthermore, it should achieve this goal without the need for further comprehensive planning and substantial fresh commitments of funds. A balanced hierarchy of towns and cities, furthermore, will advance the cause of selective regional closure.

3. Microurbanization relies upon personnel already in place, and budget resources already committed.

The importance of local-level political organization to the success of agricultural performance was established by Uphoff and Esman (1974). A major administrative change accompanying the Green Revolution was the implantation of field level technicians representing each of the multiple agencies involved in farm operations; all are centrally directed bureaucracies with regional offices in Davao City, but policy-making and coordination occurs in Manila. The magnitude of the intervention resulting has been reported by De Koninck (1979) for Malaysia and Indonesia, but overall, it has received insufficient comment.

Hackenberg (1984) argues that government has actually assumed a management function in the seed-and-fertilizer revolution by providing field personnel representing appropriate agencies which are responsible for essential operations. Land is managed by the Ministry of Agrarian Reform; water is controlled and allocated by

the National Irrigation Administration; certification for agricultural credit is provided by the Bureau of Agricultural Extension of the Ministry of Agriculture and Natural Resources. To participate, a farmer must belong to the government cooperative program, Samahang Nayon.

The increase in rice production in the Digos-Padada Valley was a manifestation of the "technocratic control" which characterized the early years of the martial law government established by Marcos in September, 1972. In a very perceptive analysis, Gable and Springer (1979: 689) argue the necessity of technology-plus-local bureaucracy to achieve this objective:

"A strategy of agricultural development which relies predominantly on science and technology places unusually heavy demands on the administrative system of a developing country. Research institutions have to be created....Seed multiplication farms, fertilizer plants, processing and storage facilities, distribution networks, retail outlets, extension services, irrigation and public works agencies, credit facilities and a myriad of other organizations have to be planned and effectively managed and coordinated. The personnel within these institutions must be recruited and trained so that they are in tune with the requirements of a change-oriented administrative system dedicated to agricultural transformation....In the Philippines, such an approach, carefully tailored to the system's potential and focused where chances of success were the greatest, made a phenomenal breakthrough."

The magnitude of the responsibility for coordination and finance of this multiple agency effort clearly indicates why it cannot be left in the hands of semi-autonomous "agropoli", and also why a substantial field level operation must be mounted and sustained.

The scale on which government intervention in agricultural development took place during the 1970's was indicated by a World Bank (1976: 163) report:

"The experience of countries like Taiwan and Japan indicates that success in raising agricultural productivity depends on...the agricultural extension services and the role of farmer organizations. In the Philippines...the inadequacies of the extension services are essentially those of organization...rather than a shortage of personnel. Some twenty-one different government agencies...provide advisory services to farmers; seven of these have a total of about twenty thousand technicians and the remaining 14 about three thousand technicians...

The seven important agencies and the number of their technicians are: The Bureau of Agricultural Extension (4,000); the Ministry of Agrarian Reform (4,000); the Ministry of Local Government and Community Development (3,500); Bureau of Plant Industry (3,000); Bureau of Animal Industry (2,200); the National Irrigation Administration (1,700), and the Bureau of Soils (1,200)."

Integration of this army of civil servants takes place at the local level with the farm technicians of the Ministry of Agrarian Reform and Bureau of Agricultural Extension (8,000 or more) taking charge. They were coordinated at farm level by the requirements of the "Masagana 99" loan program:

"Production technicians must request a list of farmer-cooperators from the Ministry of Agrarian Reform....The farmer, assisted by the production technician, prepares his farm plan and budget....In order to maintain the proper distribution of fertilizers, chemicals and seeds to M99 farmers, the distribution scheme is carried out through chits for seeds, chemicals and fertilizer. The chits... shall be issued to the farmer before the loan is approved by the rural bank....Using the chit stubs as reference the production technician visits the farmer and verifies the input applications. The production technician also oversees the utilization of these inputs.

The Rice Provincial Program Officer and production technician, together with the National Irrigation Administration superintendent prepare the master list of farmer-cooperators...The master list is submitted to the lending institution with certification of the availability of irrigation water for the purpose of approving production loans to prospective farmer cooperators.

Supervision of farmer-cooperators by production technicians is a recurrent component of the package of technology" (Castillo 1983: 251-252).

By 1975, the ratio of production technicians to "farmer-cooperators" was in the neighborhood of 1:50 (World Bank 1976: 178). In one study reported from the province of Antique (Castillo 1983: 150), the average number of production technician visits to each farm operator was ten per crop season.

Since the mid-1970s, this centralized bureaucracy with field level representation has remained in place and, if anything, has expanded in size and in interagency linkages. However, since the majority of its technical assistance functions to individual farmers are repetitive, crop after crop, a point of diminishing returns was soon reached beyond which further visits produced no gains in crop yields, and a reduction in visits would not have equated with declines in yield. In short, the farmers had learned and internalized whatever the production technicians could teach them. This point had certainly been reached by 1980 in the Digos-Padada Valley (Hackenberg 1984).

This situation is critical for the implementation of the microunurbanization process. This bureaucracy of agricultural technicians can be retrained to initiate, supervise and sustain the activities summarized in Figures 2-3 (vide supra,

p. 83). Perhaps "reoriented" would be a more appropriate term since many of them already possess the necessary training. By advancing their efforts from cereal production alone to a diversified set of economic goals containing the transitional steps from agriculture to industry, and from farm to market town, they can become instruments for the next phase of development.¹

The mechanism for the accomplishment of the major aspects of microurbanization in Southern Mindanao is already in place. The budget to support it has been authorized and committed. The personnel, or a substantial proportion of them, are already redundant from the standpoint of their original task. It remains but to obtain the consent of the Ministry of Agrarian Reform and the Bureau of Agricultural Extension to redefine their missions to incorporate these substitute tasks.²

1. As demonstrated earlier in this report (vide supra, pp. 43-44), the fertility decline observed in the Valley between 1970-1980 was just as impressive as gains in rice production and household income. It was achieved by similar means. Following the initiation of the Family Planning Outreach Project in 1975, there was a nationwide deployment of population control personnel to implement contraceptive acceptance and use at the village level. Over the next five years, 2,708 Fulltime Outreach Workers (FTOW) were deployed across the country. Their work was supplemented with the establishment of 45,332 Barrio Supply Points (BSPs) for obtaining contraceptives (Herrin and Pullum 1981).

In the province of Davao del Sur, the primary personnel utilized by the Population Commission (POPCOM) included 47 FTOW, 726 BSP Officers and 2,216 Barrio Health Workers (paramedics trained by the Ministry of Health). The number of married couples of reproductive age being served in the province in 1980 was given as 45,393 (POPCOM 1980).

As with rice production, the program goals have been attained and the massive installation of personnel, together with communications and control networks have long since passed the point of diminishing returns in terms of new recruits to contraception. The POPCOM recognizes and encourages economic activities among married women as a mechanism for promoting higher levels of investment in the education of a smaller number of children. It is expected that a substantial and positive response could be obtained from the POPCOM to a proposal that FTOW and BSP Officers be retained to serve as home economics extension workers, inculcating the desired practises pertaining to gardening, livestock and poultry raising.

2. It is very important that the microurbanization program be represented as substitutive rather than additive when discussing it with USAID and Government of Philippines personnel. There is no sympathy remaining for the notion that substantial new burdens can be accepted by workers who must continue to simultaneously fulfill previous assignments or performance goals.

4. Microurbanization creates the foundation for innovative policy initiatives.

Microurbanization is a policy initiative in itself. It is intended to support a transition from agriculture to industry through the intervening step of improved marketing and processing of farm products. And, as a by-product, microurbanization will strengthen the spatial hierarchy of urban places by encouraging migration and settlement within one or more market towns intervening between the major regional city and rural farm villages.

But it will accomplish much more by placing the instruments of capitalist development and economic growth within the reach of small farm operators. These include (1) instruction and guidance in the formation and operation of private enterprises; (2) packages of appropriate technology and (3) the capability to generate local financing and retain profits for local reinvestment. These essentials should combine into a self-sustained and self-directed growth machine, oriented toward the metropolitan market provided by Davao City or its analog in other environments.

The intent of the process is to remove two types of constraint which have obstructed national goals for regional development. First, capitalist corporate structures have thrived in the primate city environment but no where else in the country. This has rendered the hinterland subject to exploitation as a resource base, with the unfavorable outcomes predicted by the followers of Andre Gunder Frank (1966): polarization, backwash, dependency and other labels for inequitable distribution of development benefits.

Microurbanization will correct this by promoting counter-formation of healthy capitalist enterprises, with local financing and control, within the regions. The key element which is the sine qua non for attainment of this goal is the formation of a rural financial market as the source of investments. Previous attempts to "get industry going" in the countryside have been based on grants or credit at preferential interest rates. These tactics leave the entrepreneur either heavily in debt with an infant enterprise, or unable to secure further financing from conventional sources, or both.

Second, regional development has been restrained by the apparent inability of enterprises outside the primate city to attain a scale of operations above that of the family or household type of business. In part, lack of access to capital has

explained this. But another part of the explanation, less often appreciated, is embedded in the psychology of the Asian entrepreneur (Hackenberg 1977). Unlike Americans, Asian entrepreneurs are unlikely to sell the farm and then invest in the largest business they can purchase with the proceeds from the sale.

Instead, they will keep the farm and invest the profits in a series of linked small business ventures to broaden and expand their income base, e.g. a piggery, an equipment rental service, a rice-and-corn mill, and one-or-more minibuses. From a diversified base consisting of a network of this type, they might then advance to larger scale investment in a single enterprise, such as a fleet of trucks or passenger buses, or a timber concession and sawmill.

Previous attempts to generate rural industry based on entrepreneurial activity of small farm operators have sought to get them to "take the plunge". Microurbanization offers them a set of opportunities to spin off small businesses located on-farm, in town or both while continuing to operate the farm which is the centerpiece of their holdings. If we refer once again to Figure #1 (vide supra, pg. 11) it can be seen that the strategy pursued by the household with capital to invest is similar to that of the household utilizing its labor resources: diversify in order to procure multiple income sources.

The microurbanization strategy is well suited to provide an opportunity ladder for graduated investments which are acceptable to the Asian entrepreneur. Specifically, they permit the development of a portfolio of mixed farm and non-farm enterprises located in both town and rural environments, but with spatial concentration sufficient for all to be administered from a single household residence. The intent is to lead the emergent entrepreneur from (1) a large number of small investments incorporating agriculture, processing and commerce to (2) a smaller number of large investments focused primarily on industrial activities. It should also lead a significant number of them from farm to town or city as their ultimate place of permanent residence.

Microurbanization, as a strategy for development, seeks to activate implicit multipliers by forging links between elements of infrastructure, resources, production systems and services which are already in place. These potential catalysts for economic growth can be realized immediately with minimum additional investment. However, in addition to these short-run inexpensive policy options,

which are intended to be implemented with individual market towns and their hinterlands, larger scale interventions can be proposed on a regional scale. Two examples of more comprehensive strategies which can be based on the terms of this discussion will be outlined below.

a. Enterprise zones as tools for spatial organization for settlement systems.

With a regional city as a base-point, a zonal model might be constructed which would promote systematic differentiation of hinterland sectors for maximum economic interdependence and growth. Each successive zone, moving outward from the urban center, would be utilized to promote a separate category of enterprise. Enterprise zones as policy instruments can be justified in terms of three propositions from recent literature, together with our own empirical observations.

1) Density gradients and income opportunities.

Almost three decades ago, Vernon Ruttan (1955) established the principles that (a) non-farm income in rural areas is highest for those closest to an urban-industrial complex, and (b) the farm income of rural residents is also positively correlated with the size of the nearest urban-industrial complex and inversely related to distance from it.

The explanation for this is not mysterious. Both farm residents and rural non-farm workers in the shadow area of a metropolis tend to derive substantial income benefits from either part-time employment in the city or through marketing products in the city. Since settlement also tends to be heaviest in rural areas adjacent to the suburban ring (the so-called "rurban fringe"), income opportunities correspond to a density gradient with which they are positively correlated.

It follows that administrators can distribute the benefits of the metropolitan economy most widely, while discouraging the migration of rural residents to the city, by stimulating more intensive interaction with "rurban fringe" households. This could be accomplished economically and efficiently by rationalizing the productive activities which could be best performed at specific distances from the regional city. The type of activity appropriate to each sequential zone could then be encouraged with appropriate policies.

2) The growing importance of circulation as an adaptive process.

The research reviewed by Hugo (1978) and Goldstein (1978) called attention to the growing proportion of rural populations in developing countries who had become

sojourners (Nelson 1976), or temporary residents in the city. In a more recent comprehensive review, Chapman and Prothero (1983) look at circulation as a global process with examples from every major developing area. The typology of mobility patterns reproduced from Hugo (1983) is a substantial part of their discussion (see Figure #4 opposite).

In Figure #4, the first four categories of mobility represent individuals who derive a portion (or all) of their income from the city while retaining another community as their primary place of residence. Modern transportation systems facilitate this type of accommodation, and it is especially prevalent in the Philippines. Circulators have incorrectly been interpreted as products of poverty or population surpluses (Chapman and Prothero 1983: 611-613). Their adjustment pattern predates the modern period and is rooted in the desire to pursue a risk-spreading strategy with sources of income distributed as broadly as possible.

Since circulators utilize urban opportunities while residing elsewhere, the strain that their presence exerts on urban facilities is minimal. They are analogous to the daytime population of a central business district in a Western city. Maintaining and expanding circulation is a process which will distribute income produced from metropolitan economic institutions more equitably across a broader population base, while holding the strain on urban facilities and services (including housing stocks) to a minimum.

The articulation between the growth of circulation as an adjustment pattern and the density gradient described in the preceding section is obvious. The urban fringe is the most advantageous zone of residence for the circulators of the first two categories described in Figure #4. Tendency for transportation costs to rise dramatically during the latter years of the 1970s and subsequently has operated to constrict the width of this zone. In former years it had a radius of sixty kilometers north and south from Davao City.

3) Instruments available for implementing an enterprise zone policy.

In his study of land use in intermediate cities and their environs, Rivkin (1976) established a set of premises concerning the policy options available for creating enterprise zones extending outward from the regional urban center. He divides these into positive and negative instruments:

Figure #4

RURAL-TO-URBAN POPULATION MOBILITY

Type of Mover	Characteristics of Mover	Commitment to City	Commitment to Village
Commuter	Works in city but returns to village each evening. May commute regularly (each weekday) or spasmodically (to market produce, etc.)	Little financial or social investment in city. Mixes with urban dwellers but on a limited basis.	High. Family of procreation remains in the village. Retains all political and social roles in village. May have village-based income source. Bulk of income earned in city spent in village.
Seasonal or shuttle migrant	Searches for work to augment meager agricultural income.	Little financial or social investment in city. Sleep in group-rented room or employer-provided barracks. Social interaction almost entirely with other migrants from village. Employment in traditional or day-laboring sectors.	Family of procreation remains in the village. Retains all political and social roles in village. Remits bulk of income (after living expenses) to village. Retains village citizenship. Almost total orientation to village. Usually retains work source in the village.
Target migrant Short-term sojourner	Comes to city for limited period (though longer than a season) to accomplish a specific purpose (e.g., reach a particular educational level).	Moderate. May bring family of procreation. Seeks more permanent accommodation, (e.g., individually rented room). Has more interaction with settled urban population but retains close contact with fellow villagers in city. Usually employed in traditional sector.	Maintains strong links with family in village through visits and letters, although some roles may be temporarily given up. Remittances remain regular and high. Usually retains village citizenship. Usually retains a source of income in the village.
Life-cycle-stage migrant	Moves to the city at one or more specific stages of the life cycle.		
Working-life migrant	Spends entire working life in the city but intends to, and eventually does, retire to home village.	High. Family of procreation always accompanies. Purchases or builds individual housing, occupies employer- (e.g., government-) supplied housing or rents housing on a long-term basis. Often in formal-sector occupation. Has high level of interaction with settled urban population but retains contact with fellow migrants through associations. Always transfers citizenship to the city. Assists new arrivals to city from home village.	Maintains sufficient links with village to ensure acceptance on eventual return. Makes investments in village housing and land, although unable to maintain most social and political roles. Sends periodic remittances to family. Makes return visits at end of fasting months and for important ceremonies.
Permanent migrant	Committed to exchanging a rural for an urban way of life.	Total.	Very little.
Undecided migrant	Has no clear intention to stay in the city or return to the village.	Unknown.	Unknown.

SOURCE: Hugo (1983b: Table 1)

a) Positive instruments:

- Provision of infrastructure.
- Purchase and dedication of public land.
- Government-financed development programming.
- Incentives for private investment.
- Public/private development authority.

b) Negative instruments:

- Exclusionary zoning.
- Withholding building or business licenses and permits.
- Taxation.
- Removal of undesirable residents or enterprises.

The foregoing list prepared by Rivkin (1976: 32-40) is representative, if not exhaustive. Problems are immediately apparent. Positive instruments are all expensive and, therefore, limited in their applicability. The negative instruments are repressive and generally tend to promote formation of antagonistic public attitudes and efforts at evasion.

4) Enterprise zones and inclusionary zoning.

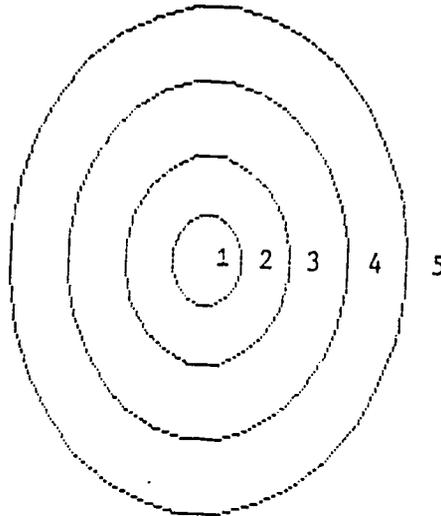
The material reviewed from the ten years of research conducted in the Digos-Padada Valley, together with the results of sequential surveys of the Davao City metropolitan area which were staged in parallel, yield several conclusions concerning the appropriate content of enterprise zones extending outward from Davao City. The possibilities are suggested in Figure #5 opposite.

The first three zones will contain both commuters and circulators of types 1-3 in Figure #4. Zones #4-5, on the other hand, are situated at a sufficient distance from Davao City that their farm households will seek supplementary income in nearby market towns such as Bansalan. The Digos-Padada Valley is a Zone #4-5 location, containing single family farms for cereal and coconut production together with plantations and timber concessions. The enterprise zones to be built up with appropriate policies and programs are those in Zones #1-3 of Figure #5.

To implement the policy, it will be necessary to proceed inductively as follows. First, an economic survey of the Davao City hinterland will be necessary to locate the boundaries between the first three zones. Decisions should not be arbitrarily made to place boundaries at fixed intervals or construct zones which are equidistant in width. In differentiating zones, primary consideration should be given to (1) local resources and existing successful enterprises; (2) transportation costs and availability; (3) density of existing population; (4) availability of

Figure #5

ENTERPRISE ZONES SURROUNDING DAVAO CITY



- Zone 1 - The portion of the city containing compact residences with high densities, together with adjacent suburbs.
- Zone 2 - The rurban fringe characterized by craftwork, artisanry and light industry, e.g., bamboo groves and bamboo or rattan furniture making; huri palm mat-making.
- Zone 3 - This, like Zone #2, is characterized by moderate density and is suitable for vegetable gardening and growth of flowers or similar specialty crops for the urban market. Fish ponds are also possible in this zone.
- Zone 4 - This is the first low density zone of settlement, suitable for extensive agriculture (rice, corn and coconut) together with livestock and poultry. However, the poultry-piggery complex can also fit into Zone #3.
- Zone 5 - This remote area should be reserved for plantations, timber concessions and other forms of extensive agribusiness. It will feature employee compounds rather than conventional settlements.

essential infrastructure (water, electric power, fuel), and (5) land costs, availability of highway frontage and related location factors.

Second, an inventory of suitable enterprises to be supported in each zone must be predetermined as the basis for policy recommendations. The supply factors to be considered in the preparation of the inventory have been reported in the first phase of the zoning operation. Suggestions for inclusion in the list of supportable ventures appear in the captions for Zones #2 and #3 in Figure #5. Two major undertakings which could be stimulated in these locations are fuel production and building materials processing. Over one-half the households in Davao City continue to rely on firewood for cooking purposes; charcoal has been gaining in popularity during the past decade. Buri mats, concrete blocks, split bamboo, pottery tile, and cement fixtures are all utilized in local home construction.

Determination of items for inclusion in the enterprise inventory for specific zones should be based on the demand existing within the city, evaluated in combination with the supply factors provided by the local resource base. In evaluating urban demand, it should be recalled that the residential districts of the city also contain businesses of the same sort which might be considered appropriate for the enterprise zones, e.g., auto repair and auto-body construction, machine shops, carpentry shops and cabinet makers, tinsmiths and sheet metal workers. Care must be taken to avoid redundancy. It is unlikely that present industries located within Zone #1 can be required or encouraged to relocate to more remote sites on the periphery. In their present positions they enjoy a competitive advantage over producers of similar goods in Zones #2-3.

These considerations are responsible for the notion of inclusionary zoning. Where most planning and zoning ordinances have as their aim the intent to exclude anomalous enterprises from residential areas, that appears to be impractical in much of Southeast Asia where cities have grown by accretion rather than design. Imposition of exclusionary zoning at this point would require a massive reassignment of homes, business and production-oriented enterprises which would be impractical and would generate massive resistance.

A more effective procedure would be to explain the advantages of locating new enterprises within the zones to prospective entrepreneurs. Incentives could be offered to promote compliance. New firms to be recruited are those which possess the following characteristics:

- a) All enterprises should be labor intensive with low to moderate skill requirements. The skilled labor force is fully employed within the city.
- b) The urban demand for the goods or services to be provided should be unequivocally established. Previous experience with employment generation programs elsewhere (Hackenberg and Hackenberg 1984) confirms the proposition that insufficient demand with resulting low utilization of capacity is the primary cause of business failure.
- c) Capital and technology requirements should be minimal. Growth to be expected from profits can be the vehicle for upscaling and modernizing the enterprises after several years of operation.
- d) Enterprises should be household-based and place of work and place of residence should be situated on the same lot. This provides for utilization of household labor and permits the business to expand more readily through recruitment of relatives who can be added to the household and minimum additional expense.
- e) Concentration of a number of similar enterprises within the same area should be encouraged. This facilitates formation of producers' cooperatives which possess many advantages: bulk purchasing of materials and the opportunity to redistribute materials within the group as needed; formation of "skills banks" among producers with exchange of assistance as required for nominal or no cost; sharing of orders to increase productive potential and the probability of on-time delivery; conversely, order-sharing in periods of slack business can be the instrument for survival.

The incentives to be provided are, first of all, those already available from the Small Business Advisory Center (SBAC) operated by the Ministry of Trade and Industry in Davao City. These include most of the "research" aspects described earlier in this section: (1) establishment of supply and demand characteristics; (2) determining capital and technology requirements. Should the requests for SBAC services exceed the resources available, expansion can be arranged through MTI access to both World Bank and USAID funds for this purpose.

Financing to establish appropriate ventures within the enterprise zones can be arranged by the establishment of a businessman's loan guaranty program in connection with one or more local banks in Davao City. The program, which is already established in Legazpi City on a trial basis, works like this:

- a) Local booster clubs, trade associations and major industries are recruited to assist small business by agreeing to accept liability for new enterprise loans up to a specified limit.
- b) The loan guaranty program may also incorporate technical assistance to participating entrepreneurs which is a feature prompting banks to more readily consider uncollateralized risks.

- c) Applicants should be screened by SBAC and referred to representatives of the loan guaranty program for certification to the participating banks. Maximum amounts should be predetermined (no more than ₱50,000 = \$2,500) and interest should be charged at market rates. Repayment schedules should be for maximum terms.
- d) Delinquent accounts should be reported by the bank to the loan guaranty program. If businessmen will participate with SBAC staff members in assessing causes, cures and consequences, the failure rate can be substantially reduced.
- e) The government should participate in shouldering the cost of bad loans, business failures and bankruptcies. The primary reason for involvement of local businessmen is to get their assistance and participation. It is not to get them to underwrite the program 100%.
- f) A contract savings provision should become part of all loan agreements to require that the enterprises accept responsibility for capital formation. Abundant examples of this practice can now be found in the literature (Von Pischke, Adams and Donald 1983). Capital could be invested with advice from the business loan guaranty group, and a proportion of the returns could be utilized to finance future expansion within the enterprise zones.

It is expected that the inclusionary zoning process will promote concentration of enterprises on and beyond the urban fringe at a rate which will promote rapid generation of employment and promote higher population densities in areas within reach of urban services from the regional capital. Yet this population growth will remain outside the city in strip and nodule settlements along major access roads to the metropolis. Occupants of Zones #2-3 will be within a radius of the urban center which will be the first two types of circular mobility in Figure #4: commuting and shuttle migration.

Enterprise zones in the region intervening between the Digos-Padada Valley and Davao City will contribute further to the promotion of mixed household employment patterns as outlined in Figure #1 (vide supra, pg. 11) and will generate supplementary income at the same time. By building up the production of goods for the urban market of Davao City while also promoting savings, a substantial additional contribution can be made to selective regional closure. This is another dimension of microubanization which is different from, but consistent with, that proposed for Bansalan, a market town of the Digos-Padada Valley. It uses existing urban resources to rapidly expand rural non-farm private sector enterprise.

b. Rural financial districts as tools for promotion of reinvestment.

Self-financing is a self-deluding concept when employed in truly impoverished rural communities. For those who are beneficiaries of the Green Revolution, it is

a genuine possibility which remains beyond reach. Inhibiting factors have been (1) long-deferred demand for consumer goods; (2) lack of access to convenient savings institutions of good character and stability; (3) disinterest of such institutions in promoting savings by small investors; (4) comparative advantage (prior to land reform) of converting spare cash into additional farm land as rapidly as possible.

To bring higher savings ratios within reach, a program such as that outlined below might be undertaken on an experimental basis in the Digos-Padada Valley. The key is the conversion of the existing rural banks to full-service local finance centers instead of retail loan windows, as recent World Bank studies have described them. They must recruit and redistribute capital productively within the districts they were intended to serve.

1) Spatial organization for revenue generation.

The first step should be to create a spatial dimension for the rural financial markets by establishing bounded districts within which each rural banking institution has the responsibility for recruitment of savings. Within the Valley, banks are presently located in the urban centers of Magsaysay, Matanao and Bansalan. However, they are fledgling institutions with no history of operations other than those associated with Masagana 99 crop production loans. These, of course, have declined significantly in the years since 1980.

Within each rural financial district, quotas should be established for savings on the basis of estimated household farm income, very much the same way as crop production quotas are established by farm technicians of the Ministry of Agrarian Reform and Bureau of Agricultural Extension. Government field workers should inform each household of its expected savings quota for a specific crop season. Districts meeting their quotas should be rewarded with significantly higher rates of interest on deposits.

Access to loan funds should also be based on meeting savings quotas. Since Green Revolution farmers are now well aware of both the need for and the cost of credit, substantial group pressure to conform should be generated within each financial district to insure that quotas are met by a majority of households. The lending capacity of well-managed banks might be supplemented with deposits of funds from government or private sources.

2) Prevention of leakage from revenue-producing districts.

The rationale underlying the rural financial district concept is that farm households are presently engaged in bank transactions if they operate on a scale

which generates substantial profits. However, they are conducting their banking in Davao City with old line national institutions: Bank of the Philippine Islands, Philippine Commercial and Industrial Bank, etc., Funds deposited in these facilities are subject to substantial "leakage": they are transferred directly to Manila. Corporate enterprises in Davao City, likewise, will negotiate their loans from headquarters offices of these banks in Manila.

To diminish this leakage, it is necessary to link rurally produced income to convenient financial institutions, and to retain savings generated within the district. While this subject has certainly not received equal time in the preceding discussion, it is of equal importance. It is a significant additional example of the process of establishing urban services to mobilize and expand economic activities based on agriculture. In other words, it too is microubanization.

E. Beyond the Green Revolution: Steps toward Urbanization and Industrial Growth.

Despite the general success of the seed-and-fertilizer revolution in solving the food production problems of the 1970s, the substratum economic structure of the countries of Southeast Asia remains much the same as in the 1960s. Large and growing populations are predominantly rural and economies are essentially agricultural producers of raw materials and food. Industries are under-sized, asymmetrically distributed, and characterized by sluggish growth.

These circumstances define the development problem for the 1980s. The gains in agricultural productivity which are the legacy of the Green Revolution must be utilized as a springboard to accelerate the transition toward urban-industrial maturity. The majority of writers on this subject---and certainly the most influential ones---continue to maintain that a log-normal distribution of urban places must evolve to accomplish this goal. They assert that this can best be achieved by radical surgery: a series of urban transplants to be installed at points remote from the primate city.

This prescription ignores the ominous implications of the surgical analogy. Transplants will be rejected by the host unless the environment is hospitable. A supportive environment for urban growth must be prepared by expanding non-agricultural aspects of the economy. In the nature of the case, this expansion must (1) utilize agricultural raw materials; (2) generate employment, absorb the expanding labor force and distribute income; (3) require minimal investment of capital per enterprise since new resources of external finance are limited by present debt.

1. Creating a high density network of small enterprises.

The proper foundation for urban growth in the regions beyond the primate city is a multiplicity of small firms extending horizontally across areas with a prosperous agricultural base. By engaging in the processing of agricultural products they will introduce industry, stimulate farm production and generate an overlay of rural non-farm employment. While much of this activity can take place on-farm or in rural habitats, a greater portion of it will strengthen and expand rural service centers and market towns, i.e., lowest order urban places. For this reason, the term "microurbanization" has been applied to the entire process.

The substratum of private sector enterprises established as commercial links between the farming regions of Davao del Sur and the metropolis of Davao City should evolve toward the transition from agriculture to industry in several ways. First, it can be predicted that the small firms, once established, will become vertically integrated through the formation of producer and marketing cooperatives and associations; eventually, they will operate their own commercial outlets in the city or become affiliates of existing ones. Second, it can be predicted that the more successful entrepreneurs will (1) accumulate capital; (2) invest in higher technology; (3) expand their employment levels, and (4) become more efficient producer of higher quality products at reduced costs.

The vertical integration of enterprises across communities will be coupled with their horizontal expansion within communities. The resulting matrix of commerce, evolved from the agricultural base provided by the region, will serve to correct two basic deficiencies which have impeded the generation of self-sustained growth. The first of these, observed by Ranis (1974), is the seeming incapacity of Philippine private enterprise to bridge the gap between the household level of organization and the "firm level", i.e., to negotiate the transition from informal to formal sector. The other deficiency is that in the urban network itself.

2. Expanding lower order communities to balance the settlement system.

Increasing the density of small and medium enterprises will expand both scope and scale of rural service centers and market towns, with resulting intensification of urban-rural linkages. However, this process does not require (nor is it apt to generate) major rural-to-urban population transfers. The microurbanization process

brings the place of industrial work to the farm owner-operator's place of residence. This is the reverse of the traditional process of urban-industrial development in the West.

It is possible to invert the traditional order because transmissible supplies of power, and communications and transportation networks, permit the ingredients of industry to be distributed to a diffuse network of household producers. Formerly, industrial prerequisites were "lumpy variables"---impossible to disaggregate effectively. It was therefore necessary to assemble both entrepreneurs and workers at places whose locus was dictated by the nature of the power supply (steam or water-power) or of transportation (ship or rail). Rapidly growing urban-industrial complexes were the result.

But earlier in the present century, the reverse pattern of industry-without-urbanization was established in the southern United States:

"The well-chronicled recent movement of industry into the South has come about at a time when the combination of hydro-electric power and motor transport has permitted location in areas around urban centers rather than in them" (Vance and Smith 1954: 110).

Since the Green Revolution countries of Southeast Asia have much greater rural population densities than those encountered in the south, disjuncture between industrial locations and urban centers is even more probable with the consequence that urbanization levels will remain low.

This definition of the situation with reference to industry and urban growth can be confirmed with data from the recent history of Davao City (Hackenberg 1983) which discloses that the proportion of the urban labor force committed to manufacturing actually contracted during the 1970s from 19 percent to 12.2. During the same interval, however, rural-based industrial employment expanded significantly. Since this growth was primarily accounted for by new investments in industrial agriculture, it cannot be expected to continue into the 1980s.

These considerations emphasize the need for intervention to mobilize and direct programs which will continue the expansion of industrial employment based on farms and in rural service centers and market towns. The purpose of this essay has been to illustrate a process through which, by establishing linkages between implicit multipliers which are themselves the heritage of the Green Revolution, this goal can be accomplished rapidly, efficiently and cheaply.

3. Project level implementation of the microubanization strategy.

The description of microubanization provided in these pages answers the call issued by Higgins (1983) at the beginning of this essay for an alternative to conventional growth pole models for intermediate urbanization. It also responds to his admonition that recommendations for more efficient spatial strategies in development planning should be specific to particular configurations of resources, infrastructure and demographic characteristics.

To make this response more than an academic exercise or a hypothetical case study, it has been set in a matrix of empirical data recently collected from a typical Green Revolution farming region in Southeast Asia. The practical application of the recommendations provided has been encouraged by placing them within a realistic framework of existing administrative structures and recoverable (also minimal) costs. However, to bring these pages to life as an experiment in development strategy, it is necessary to address the issue of implementation: can action be taken on the program proposed within the structure of existing political decision-making?

The Digos-Padada Valley is administered within the management framework provided by the central government for Region XI, Southern Mindanao, an area consisting of five provinces (see Map #2) governed from Davao City, the regional capital. The National Economic Development Authority (NEDA) has decentralized to the extent of making each regional office responsible for initiating project inventories and budget requests for each fiscal year within the overall context of a five-year master plan for the entire country prepared by the Manila office.

The NEDA planning function is linked with a parallel activating mechanism: the Regional Development Council, consisting of all provincial governors in the region serving under the leadership of one of their number, elected as chairman. Three of the five provinces making up the region have participated in the seed-and-fertilizer modernization of rice production: Davao del Norte, Davao del Sur and South Cotabato, containing 80% of Region XI's 1980 population (3.35 million). Within each, there is a market town situated at an appropriate location between a productive area of small-holder agriculture and a provincial or regional capital: Bansalan in Davao del Sur, Panabo in Davao del Norte, and Polomolok in South Cotabato.

Through NEDA and the Regional Development Council, microubanization projects could be simultaneously implemented in these three provinces with projected impact upon a majority of the region's population. This exercise would test both the impact of the strategy within the area for which it was devised (the Digos-Padada Valley in Davao del Sur), and also its replicability in contrasting environments.

TEXT TABLES

Nos. 3-19

<u>Table No.</u>	<u>Text Reference</u>
3	Pg. 28
4	30
5	30
6	33
7	33
8	36
9	38
10	39
11	40
12	41
13	41
14	41
15	42
16	43
17	44
18	44
19	44

Table 3

FARMS OWNED AND FARM OPERATOR HOUSEHOLDS
BY MUNICIPALITY, 1970 - 1980

(Number and Percent)

	Magsaysay			Matanao		
	1970	1980	%	1970	1980	%
No. of Resident Households	1138	955	84	913	786	86
No. of Farms Operated by Residents	1132	710	63	910	521	57
No. of Farm Operator Household Heads	935	662	71	701	497	71
a) Owners	429	355	83	283	306	108
b) Tenants/Leaseholders	506	307	61	418	191	46
No. of Farm Laborer Household Heads	43	104	242	28	105	375
Average Farm Size (Hectares)						
a) Owner Operated	5.96	3.45	58	8.39	4.84	58
b) Tenant/Leaseholder Operated	1.75	1.65	94	2.10	2.31	110

Table 4
 FARMS OWNED AND OPERATED BY SIZE,
 MUNICIPALITY AND DISTRICT, 1970 AND 1980
 (Mean size in hectares).

	Low Farm	High Farm	Poblacion	Total
<u>MAGSAYSAY</u>				
Owners: 1970	5.80	5.01	7.78	5.96
1980	3.74	2.81	4.12	3.45
Tenants: 1970	1.73	1.81	1.67	1.75
1980	1.54	1.70	1.82	1.65
<u>MATANAO</u>				
Owners: 1970	6.13	6.38	10.68	8.39
1980	5.06	4.54	4.87	4.84
Tenants: 1970	2.20	2.27	1.90	2.10
1980	1.98	1.76	3.22	2.31

Table 6
MEMBERS EMPLOYED PER HOUSEHOLD: 1970-1980

	Households	Employees	Emp/HH
1970: <u>MAGSAYSAY</u>			
Low Farm	395	511	1.29
High Farm	418	565	1.35
Poblacion	<u>325</u>	<u>551</u>	<u>1.70</u>
Total	1138	1627	1.43
<u>MATANAO</u>			
Low Farm	172	237	1.38
High Farm	259	344	1.33
Poblacion	<u>482</u>	<u>646</u>	<u>1.34</u>
Total	913	1227	1.34
1980: <u>MAGSAYSAY</u>			
Low Farm	332	756	2.28
High Farm	312	656	2.10
Poblacion	<u>311</u>	<u>655</u>	<u>2.11</u>
Total	955	2067	2.16
<u>MATANAO</u>			
Low Farm	169	363	2.15
High Farm	196	474	2.42
Poblacion	<u>421</u>	<u>922</u>	<u>2.19</u>
Total	786	1759	2.24
1970: Women employed per 100 Households			
Magsaysay	16.6		
Matanao	21.6		
1980: Women employed per 100 Households			
Magsaysay	92.8		
Matanao	94.6		

Table 7-A

TOTAL EMPLOYMENT BY MUNICIPALITY, 1970

	<u>Male</u>	<u>%</u>	<u>Female</u>	<u>%</u>	<u>Total</u>	<u>%</u>
1970: <u>MAGSAYSAY</u>						
1. Agricultural						
A. Farm						
1) owner	361				361	
2) tenant	533				533	
3) laborer	191				191	
Sub-total	1085	82.0			1085	71.8
B. Non-farm	8				8	
Sub-total	8	.6			8	.5
2. Non-agricultural						
1) sales	47		58		105	
2) crafts	105		34		139	
3) clerical/professional	57		51		108	
4) other	20		47		67	
Sub-total	229	17.3	190	100.0	419	27.7
3. Totals	1322	100.0	190	100.0	1512	100.0
1970: <u>MATANAO</u>						
1. Agricultural						
A. Farm						
1) owner	219				219	
2) tenant	441				441	
3) laborer	62				62	
Sub-total	722	69.4			722	58.3
B. Non-farm	2				2	
Sub-total	2	.3			2	.3
2. Non-agricultural						
1) sales	44		36		80	
2) crafts	161		56		217	
3) clerical/professional	71		63		134	
4) other	39		43		82	
Sub-total	315	30.3	198	100.0	513	41.4
3. Totals	1039	100.0	198	100.0	1237	100.0

TOTAL EMPLOYMENT BY MUNICIPALITY, 1980

		<u>Male</u>	<u>%</u>	<u>Female</u>	<u>%</u>	<u>Total</u>	<u>%</u>
1980:	<u>MAGSAYSAY</u>						
1.	Agricultural						
	A. Farm						
	1) owner	320		50		370	
	2) tenant/leasehold	317		12		329	
	3) laborer	301		125		426	
	Sub-total	938	79.4	187	21.2	1125	54.4
	B. Non-farm	17		360		377	
	Sub-total	17	1.4	360	40.6	377	18.3
2.	Non-agricultural						
	1) sales	66		176		242	
	2) crafts	62		22		84	
	3) clerical/professional	42		98		140	
	4) other	56		43		99	
	Sub-total	226	19.2	339	38.2	565	27.3
3.	Totals	1181	100.0	886	100.0	2067	100.0
1980:	<u>MATANAO</u>						
1.	Agricultural						
	A. Farm						
	1) owner	262		34		296	
	2) tenant/leasehold	191		10		201	
	3) laborer	304		168		472	
	Sub-total	757	74.6	212	28.4	969	55.1
	B. Non-farm	12		276		288	
	Sub-total	12	1.3	276	37.0	288	16.5
2.	Non-agricultural						
	1) sales	33		109		142	
	2) crafts	80		24		104	
	3) clerical/professional	42		84		126	
	4) other	90		39		129	
	Sub-total	245	24.1	256	34.4	501	28.4
3.	Totals	1014	100.0	744	100.0	1758	100.0

Table 8

HOUSEHOLD INCOME, 1970-1980, BY MUNICIPALITY AND DISTRICT

	1970 (Annual)				1980 (Monthly)			
	Median	Mean	Standard Deviation	Coefficient of Variation	Median	Mean	Standard Deviation	Coefficient of Variation
MAGSAYSAY								
Low Farm Income District	748	1353	2144	158.43	940	1446	1861	128.75
High Farm Income District	1143	1904	1920	100.80	1286	1870	1877	100.39
Poblacion	1137	1891	2313	122.26	941	1559	2065	132.24
Total	948	1711	2128	124.38	1047	1621	1943	119.86
MATANAO								
Low Farm Income District	320	528	737	139.62	532	1023	1803	176.17
High Farm Income District	696	1159	1343	115.94	724	1221	2106	172.48
Poblacion	952	2059	2741	133.16	713	1226	1784	145.52
Total	712	1506	2215	147.05	675	1181	1875	158.72

1. 1970 income figures are annual.
1980 income figures are monthly.
In 1980, the 1970 peso had depreciated to 25 centavos.

Table 9

1980 MONTHLY HOUSEHOLD INCOME

	M A G S A Y S A Y							
	Low Farm Income		High Farm Income		Poblacion		Totals	
	N	%	N	%	N	%	N	%
0- 149	3	.90	5	1.60	1	.32	9	.94
150- 299	20	6.02	12	3.85	18	5.79	50	5.24
300- 449	34	10.24	22	7.05	32	10.29	88	9.21
450- 599	42	12.65	17	5.45	37	11.90	96	10.05
600- 749	29	8.73	22	7.05	42	13.50	93	9.74
750- 999	50	15.06	35	11.22	34	10.93	119	12.46
1000- 1249	41	12.35	39	12.50	37	11.90	117	12.25
1250- 1499	19	5.72	28	8.97	29	9.32	76	7.96
1500- 1749	20	6.02	24	7.69	12	3.86	56	5.86
1750- 1999	9	2.71	24	7.69	12	3.86	45	4.71
2000- 2249	17	5.12	11	3.53	6	1.93	34	3.56
2250- 2499	9	2.71	9	2.88	6	1.93	24	2.51
2500- 2749	3	.90	14	4.49	5	1.61	22	2.31
2750- 2999	7	2.11	5	1.60	7	2.25	19	1.99
3000- 3999	14	4.22	14	4.49	8	2.57	36	3.77
4000- 4999	3	.90	8	2.56	8	2.57	19	1.99
5000- 5999	2	.60	4	1.28	4	1.29	10	1.05
6000- 6999	5	1.51	7	2.24	4	1.29	16	1.68
7000- 7999			5	1.60	3	.96	8	.84
8000- 8999			4	1.28			4	.42
9000- 9999	2	.60	2	.64	4	1.29	8	.84
10000-14999	2	.60	1	.32			3	.31
15000-19999					2	.64	2	.21
20000-	1	.30					1	.10
Total	332	100.00	312	100.0	311	100.00	955	100.00
Median Income	940		1286		941		1047	
Mean Income	1461		1870		1559		1626	

	M A T A N A O							
	Low Farm Income		High Farm Income		Poblacion		Totals	
	N	%	N	%	N	%	N	%
0- 149	3	1.78			2	.48	5	.64
150- 299	37	21.89	16	8.16	40	9.50	93	11.83
300- 449	32	18.93	28	14.29	69	16.39	129	16.41
450- 599	22	13.02	40	20.41	62	14.73	124	15.78
600- 749	18	10.05	17	8.67	49	11.64	84	10.69
750- 999	16	9.47	38	19.39	59	14.01	113	14.38
1000- 1249	12	7.10	15	7.65	29	6.89	56	7.12
1250- 1499	5	2.96	12	6.12	22	5.23	39	4.96
1500- 1749	5	2.96	8	4.08	21	4.99	34	4.33
1750- 1999	5	2.96	6	3.06	10	2.33	21	2.67
2000- 2249	3	1.78	2	1.02	11	2.62	16	2.04
2250- 2499	2	1.18	2	1.02	8	1.90	12	1.53
2500- 2749	1	.59			2	.48	3	.38
2750- 2999			1	.51	4	.95	5	.64
3000- 3999	1	.59	2	1.02	14	3.33	17	2.16
4000- 4999	2	1.18	2	1.02	7	1.66	11	1.40
5000- 5999			1	.51	4	.95	5	.64
6000- 6999	2	1.18	1	.51	2	.48	5	.64
7000- 7999			1	.51	2	.48	3	.38
8000- 8999					1	.24	1	.13
9000- 9999			1	.51			1	.13
10000-14999	3	1.78	2	1.02	1	.24	6	.76
15000-19999					1	.24	1	.13
20000-			1	.51	1	.24	2	.25
Total	169	100.00	196	100.00	421	100.00	786	100.00
Median Income	532		724		713		675	
Mean Income	1018		1237		1231		1187	

USE OF ELECTRICITY BY MUNICIPALITY AND DISTRICT

	Low Farm Income		High Farm Income		Poblacion		Totals	
	N	%	N	%	N	%	N	%
A. LIGHTING								
<u>MAGSAYSAY</u>								
oil/kerosene	280	84.3	242	77.6	153	49.2	675	70.7
pressure lamp	6	1.8	11	3.5	1	.3	18	1.9
electricity	44	13.3	59	18.9	157	50.5	260	27.2
other	2	.6					2	.2
Totals	332	100.0	312	100.0	311	100.0	955	100.0
<u>MATANAO</u>								
oil/kerosene	166	98.2	157	80.1	236	56.1	559	71.1
pressure lamp	3	1.8			6	1.4	9	1.2
electricity			39	19.9	178	42.3	217	27.6
other					1	.2	1	.1
Totals	169	100.0	196	100.0	421	100.0	786	100.0
B. ELECTRICAL APPLIANCE OWNERSHIP								
<u>MAGSAYSAY</u>								
No elect.	275	82.8	225	72.1	141	45.3	641	67.0
Light only	25	7.5	39	12.5	53	17.1	117	12.3
Small appliance	20	6.1	23	7.4	74	23.8	117	12.3
Large appliance ⁽¹⁾	12	3.6	25	8.0	43	13.8	80	8.4
Totals	332	100.0	312	100.0	311	100.0	955	100.0
<u>MATANAO</u>								
No elect.	169	100.0	151	77.0	157	37.3	477	60.7
Light only			6	3.1	73	17.3	79	10.1
Small appliance			22	11.2	104	24.7	126	16.0
Large appliance ⁽¹⁾			17	8.7	87	20.7	104	13.2
Totals	169	100.0	196	100.0	421	100.0	786	100.0

1. These categories are assumed to be cumulative. Thus a household with large appliances will also have lights and small appliances.

Small appliances are: fan, radio, electric iron
 Large appliances are: stereo, TV, refrigerator

Table 11
 POPULATION 1970-1980
 (Percent)

	MAGSAYSAY				MATANAO			
	1970	%	1980	%	1970	%	1980	%
0- 4	1296	19.8	720	12.9	996	17.8	583	13.0
5- 9	1080	16.5	851	15.3	976	17.4	576	12.8
10-14	901	13.8	861	15.5	849	15.1	661	14.7
15-19	716	11.0	697	12.5	656	11.7	578	12.9
20-24	501	7.7	489	8.8	401	7.1	478	10.6
25-29	452	6.9	383	6.9	360	6.4	320	7.1
30-34	425	6.5	302	5.4	330	5.9	243	5.4
35-39	288	4.4	224	4.0	269	4.8	209	4.6
40-44	240	3.7	262	4.7	243	4.3	187	4.1
45-49	224	3.4	211	3.8	177	3.2	172	3.8
50-54	134	2.1	157	2.8	137	2.4	161	3.6
55-59	118	1.8	115	2.5	86	1.5	103	3.1
60-64	65	1.0	109	1.9	66	1.2	89	1.9
65+	<u>89</u>	1.4	<u>168</u>	3.0	<u>64</u>	1.2	<u>111</u>	2.4
Total	6529		5549		5610		4471	
Median Ages	14.73		17.46		14.66		18.59	

Table 12

POPULATIONS AND HOUSEHOLDS BY DISTRICT, 1970-1980

A. POPULATIONS					
	1970		1980		1980 as % of 1970
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	
<u>MAGSAYSAY</u>					
Lo Farm	2187	33.5	1914	34.5	87.5
Hi Farm	2422	37.1	1847	33.3	76.3
Poblacion	1921	29.4	1788	32.2	93.1
Total	6529	100.0	5549	100.0	85.0
<u>MATANAO</u>					
Lo Farm	1044	18.6	932	20.8	89.3
Hi Farm	1562	27.8	1107	24.8	70.9
Poblacion	3004	53.5	2432	54.4	81.0
Total	5610	100.0	4471	100.0	79.7
B. HOUSEHOLDS					
	1970		1980		1980 as % of 1970
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	
<u>MAGSAYSAY</u>					
Lo Farm	395	34.7	332	34.8	84.1
Hi Farm	418	36.7	312	32.7	74.6
Poblacion	325	28.6	311	32.5	95.7
Total	1138	100.0	955	100.0	83.9
<u>MATANAO</u>					
Lo Farm	172	18.8	169	21.5	98.3
Hi Farm	259	28.4	196	24.9	75.7
Poblacion	482	52.8	421	53.6	87.3
Total	913	100.0	786	100.0	86.1

Table 13
HOUSEHOLD MIGRATION
1970-1980

	1970 Households	1980 Sedentary	% of 1970	In-migrant 1980*	% of 1980
<u>MAGSAYSAY</u>					
Lo Farm	395	304	77.0	28 (332)	8.4
Hi Farm	418	264	63.2	48 (312)	15.4
Poblacion	<u>325</u>	<u>192</u>	<u>59.1</u>	<u>119</u> (311)	<u>38.3</u>
Total	1138	760	66.8	195 (955)	20.4
<u>MATANAO</u>					
Lo Farm	172	148	86.0	21 (169)	12.4
Hi Farm	259	153	59.1	43 (196)	21.9
Poblacion	<u>482</u>	<u>360</u>	<u>74.7</u>	<u>61</u> (421)	<u>14.5</u>
Total	913	661	72.4	125 (786)	15.9

*Figures in parenthesis are total households resident in each district in 1980.

Table 14

LOCATION OF ABSENT CHILDREN BY RESIDENCE CLASS, AGE, SEX AND STATUS

	<u>Magsaysay</u>									<u>Total Population</u>															
	Same Mun.			Other Rural Same Prov.			Town w/in Reg. XI			Davao City			Other Rural Other Prov.			Other Urban Other Prov.			Inter-national			TOTALS			
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	
5-9	1		1											1		1							2	1	3
10-14	1		1					1	1	2				1		1							5	1	6
15-19	10	33	43	3	6	9	2	2	4	2	6	8		10	10	1	13	14	1		1	19	70	89	
20-24	63	80	143	5	7	12	10	11	21	6	16	22	4	13	17	14	27	41	2	2	4	104	156	260	
25-29	74	85	159	9	9	18	15	17	32	15	15	30	7	12	19	22	25	47	1	3	4	143	166	309	
30-34	47	52	99	11	2	13	8	15	23	6	12	18	11	9	20	15	16	31	3	1	4	101	107	208	
35-39	33	32	65	2	5	7	4	8	12	8	2	10	2	13	15	7	8	15	3		3	59	68	127	
40-44	17	16	33	4	4	8	2	4	6	5	3	8	5	3	8	11	7	18	1		1	45	37	82	
45-49	10	14	24	2	2	4	3	5	8	1	1	2	5	2	7	2	5	7				23	29	52	
50-54	8	5	13	1		1		1	1		1	1	3		3	4	1	5		1	2	16	9	25	
55-59	<u>2</u>	<u>1</u>	<u>3</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>1</u>	<u>—</u>	<u>1</u>	<u>2</u>	<u>—</u>	<u>2</u>	<u>5</u>	<u>1</u>	<u>6</u>	
TOTAL	266	318	584	37	35	72	45	64	109	43	56	99	39	62	101	79	103	182	13	7	20	522	645	1167	
Percent			50.0			6.2			9.3			8.5			8.6			15.6			1.7			100.0	

LOCATION OF ABSENT CHILDREN BY RESIDENCE CLASS, AGE, SEX AND STATUS

Matanao	Total Population									T O T A L S																				
	Same Mun.			Other Rural Same Prov.			Town w/in Reg. XI						Davao City			Other Rural Other Prov.			Other Urban Other Prov.			Inter-national								
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T						
0-4	1		1																						2		2			
5-9	1		1																									2	1	3
10-14	1	2	3		2	2																						2	7	9
15-19	1	24	25	4	3	7	2	3	5	1	4	5	1	3	4	4	5	9										13	42	55
20-24	38	51	89	5	11	16	11	22	33	6	14	20	11	19	30	9	14	23	1	1								80	132	212
25-29	51	67	118	14	11	25	21	12	33	13	11	24	11	12	23	21	16	37	1	2	3							132	131	263
30-34	38	34	72	4	14	18	11	17	28	9	13	22	18	14	32	3	8	11										83	100	183
35-39	33	27	60	9	4	13	7	2	9	5	7	12	10	11	21	4	8	12	1	1								68	60	128
40-44	14	7	21	6	10	16		7	7	4		4	7	4	11	1	3	4										32	31	63
45-49	6	9	15	5	2	7		4	4	2	4	6	2	8	10	3		3										18	27	45
50-54	1	1	2		1	1	2	1	3		2	2	4	1	5		2	2	1	1								7	9	16
55-59	1	1	2	2	1	3	2		2				1		1													6	2	8
60+	—	—	—	—	1	1	—	—	—	—	—	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	1	1	2
TOTAL	186	223	409	49	60	109	56	68	124	40	55	95	68	74	142	46	58	104	1	5	6							446	543	989
Percent	41.4			11.0			12.5			9.6			14.4			10.5			.6			100.0								

Table 15

OCCUPATIONS OF ABSENT CHILDREN BY RESIDENCE CLASS AND SEX

	<u>Magsaysay</u>							TOTALS
	Same Mun.	Other Rural Same Prov.	Town w/in Reg. XI	Davao City	Other Rural Other Prov.	Other Urban Other Prov.	Inter-national	
MALE								
OCCUPATIONS								
Farm owner	60	11	4	4	8	10	0	97
Leaseholder	130	15	6	2	10	8	0	171
Farm Laborer	27	2	1	1	1	3	0	35
<u>Subtotal</u>	217	28	11	7	19	21	0	303
Self-employed	13	1	8	9	4	5	0	40
Prof/Clerical	0	1	2	8	1	8	2	22
Other Wage	22	5	19	17	11	31	8	113
<u>Subtotal</u>	35	7	29	34	16	43	10	175
Unemployed	13	3	5	2	3	16	0	42
TOTALS	266	37	45	43	39	79	13	522
FEMALE								
OCCUPATIONS								
Farm Owner	5	0	2	0	1	1	0	9
Leaseholder	5	0	0	0	1	1	0	7
Farm Laborer	13	0	0	0	1	1	0	15
<u>Subtotal</u>	23	0	2	0	3	3	0	31
Self-employed	74	6	9	7	5	12	0	113
Prof/Clerical	13	2	9	8	3	17	2	54
Other Wage	8	1	2	4	1	6	0	22
<u>Subtotal</u>	95	9	20	19	9	35	2	189
Unemployed	202	26	42	37	47	68	4	425
TOTALS	318	35	64	56	62	103	7	645

OCCUPATIONS OF ABSENT CHILDREN BY RESIDENCE CLASS AND SEX

Matanao	Total Population							TOTALS
	Same Mun.	Other Rural Same Prov.	Town w/in Reg. XI	Davao City	Other Rural Other Prov.	Other Urban Other Prov.	Inter-national	
MALE OCCUPATIONS								
Farm owner	35	15	4	3	14	0	0	71
Leaseholder	63	18	11	1	23	1	0	117
Farm Laborer	33	6	4	2	4	0	0	49
<u>Subtotal</u>	131	39	19	6	41	1	0	237
Self-employed	8	2	5	3	1	2	0	21
Prof/Clerical	4	0	8	7	4	9	0	32
Other Wage	35	8	22	21	18	26	1	131
<u>Subtotal</u>	47	10	35	31	23	37	1	184
Unemployed	8	0	2	3	4	8	0	25
TOTALS	186	49	56	40	68	46	1	446
FEMALE OCCUPATIONS								
Farm Owner	1	0	1	0	1	0	0	3
Leaseholder	0	0	0	0	2	0	0	2
Farm Laborer	3	1	0	0	1	0	0	5
<u>Subtotal</u>	4	1	1	0	4	0	0	10
Self-employed	47	12	8	4	5	4	0	80
Prof/Clerical	18	3	11	4	1	6	3	46
Other Wage	8	2	10	6	3	9	1	39
<u>Subtotal</u>	73	17	29	14	9	19	4	165
Unemployed	146	42	38	41	61	39	1	368
TOTALS	223	60	68	55	74	58	5	543

Table 16
 1970-1980
 FERTILITY COMPARISONS

	MAGSAYSAY	MATANAO
a) Crude Birth Rates:		
1970	45.8	44.5
1980	20.5	25.9
b) Total Fertility Rates, 15-49 (All Women):		
1970	7.40	7.50
1980	3.34	4.09
c) Total Fertility Rates, 15-49 (Married Women):		
1970	9.38	10.27
1980	6.45	7.65

Table 17

USERS OF CONTRACEPTIVE METHODS: MARRIED WOMEN AGES 15-44

	M A G S A Y S A Y				M A T A N A O			
	Low Farm Income	High Farm Income	Poblacion	Total	Low Farm Income	High Farm Income	Poblacion	Total
A. <u>Effective Methods</u>								
IUD	12	43	27	82	0	16	22	38
Pill	23	26	15	64	14	8	32	54
Ligation	10	25	13	48	1	4	20	25
Vasectomy	5	1	3	9	1	1	7	9
Pill/other	3	0	1	4	0	0	1	1
Subtotal	53	95	59	207	16	29	82	127
B. <u>Less Effective Methods</u>								
Rhythm	29	22	17	68	21	14	32	67
Abstinence	5	6	8	19	7	6	9	22
Condom	4	3	7	14	2	1	4	7
Withdrawal	7	3	1	11	2	7	6	15
Other	6	3	6	15	0	3	6	9
Subtotal	51	37	39	127	32	31	57	120
C. Total	104	132	98	334	48	60	139	247
Married Women 15-44	189	207	194	590	88	116	238	442
% Users of Any Method	55.0	63.8	50.5	56.6	54.5	51.7	58.4	55.9
% Users of Effec- tive Method	28.0	45.9	20.1	35.1	18.2	25.0	34.5	28.7

Table 18
1970-1980 NUPTIALITY

	MAGSAYSAY		MATANAO	
	<u>1970</u> (%)	<u>1980</u> (%)	<u>1970</u> (%)	<u>1980</u> (%)
15-19	23.8	6.0	11.2	6.1
20-24	69.5	34.2	55.7	33.6
25-29	87.5	76.8	88.5	72.1
30-34	95.5	91.7	96.2	76.3
35-39	95.7	94.3	99.2	90.3
40-44	97.2	97.7	99.1	96.7
45-49	97.8	97.2	97.6	97.8
Women 15-29 % Married	57.0	33.2	44.2	30.5

Table 19

EDUCATIONAL ACHIEVEMENT BY AGE, SEX
AND MUNICIPALITY, 1970 AND 1980

A. MAGSAYSAY

	Male		Female	
	<u>1970</u>	<u>1980</u>	<u>1970</u>	<u>1980</u>
15-19	5.72	8.46	6.22	9.31
20-24	5.71	8.16	6.13	9.78
25-29	5.61	7.89	5.46	8.33
30-34	5.38	7.57	5.05	5.25
35-39	4.53	5.08	4.20	4.72
40-44	4.54	4.29	4.24	4.10
45-49	3.67	4.00	3.11	3.22
50-54	3.67	3.82	3.54	3.75
55-59	2.64	3.66	1.83	3.16
60-64	2.48	3.07	2.10	2.22
65+	1.46	1.43	.96	1.26

B. MATANAO

	Male		Female	
	<u>1970</u>	<u>1980</u>	<u>1970</u>	<u>1980</u>
15-19	5.72	8.23	6.48	9.29
20-24	5.58	8.48	6.25	10.12
25-29	4.89	7.37	5.05	7.23
30-34	4.90	5.59	4.75	5.46
35-39	4.73	4.22	4.56	4.34
40-44	4.58	4.27	4.39	4.28
45-49	3.83	4.11	2.73	4.00
50-54	3.78	4.28	2.68	3.80
55-59	1.96	4.19	2.50	3.14
60-64	2.62	3.23	1.26	2.50
65+	1.50	2.94	1.35	1.29

REFERENCES

- Adams, Dale W.
1978 Mobilizing Households Savings through Rural Financial Markets. Economic Development and Cultural Change, 26:547-560.
- Baker, Christopher
1981 Economic Reorganization and the Slump in South and Southeast Asia. Comparative Studies in Society and History, 23:3, 325-349.
- Ben-Porath, Yoram
1980 The F-connection: Families Friends and Firms and the Organization of Exchange. Population and Development Review, 6:1-30.
- Parker, R. and V.G. Cordova
1978 Labor Utilization in Rice Production. In Economic Consequences of the New Rice Technology, 113-136. International Rice Research Institute. Los Banos.
- Barth, Gerald A.
1982 Food Supply, Distribution and Marketing in Davao City, Philippines. Ph. D. Dissertation. Boulder. University of Colorado.
- Bello, Walden, David Kinley and Elaine Elinson
1982 Development Debacle: The World Bank in the Philippines. San Francisco. Institute for Food and Development Policy.
- Binswanger, H.P. and V.W. Ruttan
1977 Induced Innovation: Technology, Institutions and Development. Baltimore Johns Hopkins.
- Blalock, Hubert M.
1972 Social Statistics. New York. McGraw-Hill.
- Castillo, Celia T.
1983 How Participatory is Participatory Development? Manila. Philippine Institute for Development Studies.
- Concepcion, Mercedes and Peter C. Smith
1977 The Demographic Situation in the Philippines. Papers of the East West Population Institute, No. 44. Honolulu. East West Center
- Chapman, Murray and R. Mansell Prothero
1983 Themes on Circulation in the Third World. International Migration Review, 17:597-632.
- Chenery, Hollis, et al
1974 Redistribution with Growth. New York. Oxford.
- Chetwynd, Eric
1980 Regional Planning Projects to Strengthen the Contribution of Urban Centers to Rural Development. Washington. Office of Urban Development. U. S. Agency for International Development.
- Child, Frank C. and Hiromitsu Kaneda
1975 Links to the Green Revolution: A Study of Small-scale Agriculturally Related Industry in the Pakistan Punjab. Economic Development and Cultural Change, 23:249-275.

- De Koninck, Rodolphe
1979 The Integration of the Peasantry: Examples from Malaysia and Indonesia. Pacific Affairs, 52:265-293.
- Duff, B.
1978 Mechanization and Use of Modern Varieties. In Economic Consequences of the New Rice Technology, 165-172. Los Banos. International Rice Research Institute.
- Falcon, Walter P.
1971 The Green Revolution: Second Generation Problems. American Journal of Agricultural Economics, December, 701-709.
- Far Eastern Economic Review (FEER)
1984 Asia 1984 Yearbook. Far Eastern Economic Review. Hong Kong.
- Fields, Gary S.
1975 Rural-urban Migration, Urban Unemployment and Underemployment, and Job Search Activity in LDC, Journal of Development Economics, 2:165-188.
- Firmalino, Tito C., and Adrienne Agpalza
1974 Government Reorganization and Regional Planning. Philippine Planning Journal, 4-5:73-85.
- Frank, Andre Gunder
1966 Latin America: Underdevelopment or Revolution Monthly Review Press, September.
- Friedmann, John
1981 The Active Community: Toward a Political-Territorial Framework for Rural Development in Asia. Economic Development and Cultural Change, 29:247-258.
- Friedmann, John and Mike Douglass
1978 Agropolitan Development: Towards a New Strategy for Regional Planning in Asia. In Fu-chen Lo and Kamal Salih, Eds. Growth Pole Strategy and Regional Development Policy, 163-192. New York. Pergamon.
- Friedmann, John, and Clyde Weaver
1979 Territory and Function. Berkeley. University of California.
- Gable, Richard W. and J. Fred Springer
1979 Administrative Implications of Development Policy: Comparative Analysis of Agricultural Programs in Asia. Economic Development and Cultural Change, 27:687-704.
- Geertz, Clifford
1963 Agricultural Involution: The Processes of Ecological Change in Indonesia. Berkeley. University of California.
- Gilbert, Alan
1978 The Dynamics of Human Settlement Systems in LDCs: Priorities for Urban Policy Formation. In Niles M. Hansen, Ed., Human Settlement Systems, 177-194. Cambridge. Ballinger.
- Golay, Frank, and Marvin Goodstein
1967 Rice and People in 1990: Philippine Rice Requirements. Manila. U. S. Agency for International Development.

Goldstein, Sidney

- 1978 Circulation in the Context of Total Mobility in Southeast Asia. Papers of the East West Population Institute. No. 53. Honolulu. East West Center.

Griffin, Keith

- 1974 The Political Economy of Agrarian Change: An Essay on the Green Revolution. Cambridge. Harvard University.

Hackenberg, Beverly

- 1979 On the Road to Development: Impact of Infrastructure on the Changing Economic Lives of Women in Southern Mindanao. Manila. U. S. Agency for International Development.

Hackenberg, Robert A.

- 1958 Prediction and Control of Social Change: The Theoretical Basis of Applied Anthropology. Bureau of Ethnic Research. University of Arizona. Tucson.
- 1971 The Cybernetic Village. Southeast Asian Journal of Sociology, 4:5-27.
- 1972 Restricted Interdependence: The Adaptive Pattern of Papago Indian Society. Human Organization, 31:113-126.
- 1974 The Poverty Explosion: Population Increase and Income Decline in Davao City. Philippine Planning Journal, 4-5:15-44.
- 1974 Ecosystemic Channeling: Cultural Ecology from the Viewpoint of Aerial Photography, in E.Z. Vogt, Ed., Aerial Photography in Anthropological Fieldwork, 23-39. Cambridge. Harvard University.
- 1976 Colorado River Basin Development and Its Potential Impact on Tribal Life, Human Organization, 35: 303-311.
- 1977 Exports, Entrepreneurs and Equity: A Solution to the Problems of Population and Poverty in Southeast Asia. In W. Loehr and J. Powelson, Eds., Economic Development, Poverty and Income Distribution, 81-112. Boulder. Westview.
- 1980 New Patterns of Urbanization in Asia, Population and Development Review, 6: 391-420.
- 1982 Diffuse Urbanization and the Resource Frontier: New Patterns of Philippine Urban and Regional Development. In O.P. Mathur, Ed., Small Cities and National Development, 139-176. Nagoya. United Nations Centre for Regional Development.
- 1983 The Urban Impact of Agropolitan Development: The Changing Regional Metropolis in the Southern Philippines. Comparative Urban Research, 10:69-98.
- 1984 Farm Modernization and Fertility Decline in the Southern Philippines. Working Paper No. 3. Population Program. Institute of Behavioral Science. University of Colorado. Boulder.
- 1984 Ilocanos Transplanted: Cultural Persistence and Government Intervention in Two Irrigation-based Filipino Migrant Communities. In S. Griffiths and H. MacArthur, Eds., The Ilocos and Its People. Honolulu. University of Hawaii. In press.

- Hackenberg, Robert A., and Beverly Hackenberg
1971 Secondary Development and Anticipatory Urbanization in Davao City. Pacific Viewpoint, 12:1-20.
1984 Developing Intermediate Cities as Agro-Industrial Processing Centres. Regional Development Dialogue, 5:74-109.
- Hackenberg, Robert A., and Henry F. Magalit
1980 Philippine Population Growth in the 1970s. Monograph No. 6. Davao City.
- Hansen, Niles H.
1982 The Role of Small and Intermediate Cities in National Development Processes and Strategies. In O. P. Mathur, Ed., Small Cities and National Development, 301-326. Nagoya. United Nations Centre for Regional Development.
- Hart, Donn V.
1955 The Philippine Plaza Complex: Focal Point in Culture Change. Southeast Asia Studies. Yale University. New Haven.
- Hayami, Yujiro, and Masao Kikuchi
1981 Asian Village Economy at the Crossroads. Tokyo and Baltimore. University of Tokyo and Johns Hopkins University.
- Herrin, Alex, and Thomas Pullum
1981 An Impact Assessment: Population Planning II. Population Commission of the Philippines and U. S. Agency for International Development.
- Higgins, Benjamin
1979 Dualism, Dependency, Informal Sectors and Continuing Underdevelopment. UNCRD Working Paper WP:79-04. Nagoya. United Nations Centre for Regional Development.
1983 From Growth Poles to Systems of Interaction in Space. Growth and Change, 14:3-13.
- Hugo, Graeme
1982 Circular Migration in Indonesia. Population and Development Review, 8:59-83.
1983 Population Mobility and Wealth Transfers in Indonesia and Other Third World Societies. Papers of the East West Population Institute. No. 87. Honolulu. East West Center.
- International Rice Research Institute (IRRI)
1978 Economic Consequences of the New Rice Technology. Los Banos.
1979 Farm Level Constraints to High Rice Yields in Asia. Los Banos.
- Jones, Gavin
1975 Implications of Prospective Urbanization for the Development of Southeast Asia. In J. F. Kantner and Lee McCaffrey, Eds., Population and Development in Southeast Asia, 99-118. Lexington. D.W.Heath.
- Laquian, Aprodicio
1973 Urban Tensions in Southeast Asia in the 1970s. In W. H. Wriggins and J. F. Guyot, Eds., Population, Politics and the Future of Southern Asia, 120-146. New York. Columbia.

- Lewis, Henry T.
1971 Ilocano Rice Farmers. Honolulu. University of Hawaii.
- Lipton, Michael
1978 Inter-farm, Inter-regional and Farm-Non-farm Income Distribution: The Impact of the New Cereal Varieties. World Development, 6:319-337.
- Lo, Fu-chen, and Kamal Salih, Eds.
1978 Growth Pole Strategy and Regional Development Policy. New York. Pergamon.
- Lo, Fu-chen, Kamal Salih and Mike Douglass
1978 Uneven Development, Rural-urban Transformation, and Regional Development Alternatives in Asia. Working Paper. United Nations Centre for Regional Development. Nagoya.
- McGee, T. G.
1978 Doubts about Dualism: Implications for Development Planning. Working Paper WP: 78-03. United Nations Centre for Regional Development. Nagoya.
1979 Labour Mobility in Fragmented Markets, Rural-urban Linkages and Regional Development in Asia. Working Paper WP: 79-05. United Nations Centre for Regional Development. Nagoya.
1980 Labour Markets, Urban Systems and the Urbanization Process in Southeast Asia. Workshop on Intermediate Cities in Southeast Asia. East West Population Institute. East West Center. Honolulu.
- Myint, Hla
1971 Green Revolution in Southeast Asia. In Southeast Asia's Economy in the 1970s, 5-17. New York. Oxford.
- Nelson, Joan
1976 Sojourners versus New Urbanites: Causes and Consequences of Temporary versus Permanent Migration in Developing Countries, Economic Development and Cultural Change, 24:721-757.
- Oshima, Harry T.
1971 Labor Force Explosion and the Labor-intensive Sector in Asian Growth. Economic Development and Cultural Change, 19:161-183.
1981 A. Lewis' Dualistic Theory: Its Relevance for Postwar Asian Growth. Malayan Economic Review, 26:?.
1983 The Industrial and Demographic Transitions in East Asia. Population and Development Review, 9:583-608.
- Pearse, Andrew
1975 The Latin American Peasant. London. Cass.
- Pelzer, Karl
1945 Pioneer Settlement in the Asiatic Tropics. American Geographical Society. Publication No. 29. New York.
- Population Commission of the Philippines (POPCOM)
1980 Annual Report: Region XI, Southern Mindanao. Davao.
- Richardson, Harry T.
1982 Policies for Strengthening Small Cities in Developing Countries. In O. P. Mathur, Ed., Small Cities and National Development, 327-354. Nagoya. United Nations Centre for Regional Development.

Ranis, Gustav

1973 Industrial Sector Labor Absorption. Economic Development and Cultural Change, 21:387-408.

1974 Employment, Equity and Growth: Lessons from the Philippine Employment Mission, International Labour Review, 110:17-27.

Rivkin, Malcolm D.

1976 Land Use and Intermediate-Size Cities in Developing Countries. New York. Praeger.

1982 Approaches to Planning for Secondary Cities in Developing Countries. Office of Urban Development. U. S. Agency for International Development. Washington.

Roberts, Bryan

1978 Cities of Peasants. Sage. Los Angeles.

Rondinelli, Dennis

1983 Secondary Cities in Developing Countries. Los Angeles. Sage.

1984 Cities and Agricultural Development. Regional Development Dialogue, 5:1-21.

Rondinelli, Dennis, and Kenneth Ruddle

1978 Urbanization and Rural Development: A Spatial Policy for Equitable Development. New York. Praeger.

Rondinelli, Dennis, John R. Nellis and G. S. Cheema

1983 Decentralization in Developing Countries. Working Paper No. 581. World Bank. Washington.

Ruttan, Vernon

1955 The Impact of Urban-Industrial Development on Agriculture in the Tennessee Valley and the Southeast. Journal of Farm Economics, 37:38-56.

1977 The Green Revolution: Seven Generalizations. International Development Review, 20:16-23.

1978 New Rice Technology and Agricultural Development Policy. In Economic Consequences of the New Rice Technology, 367-382. International Rice Research Institute. Los Banos.

Salih, Kamal, et al

1978 Decentralization Policy, Growth Pole Approach, and Resource Frontier Development: A Synthesis of the Response in Four Asian Countries. In Fu-chen Lo and Kamal Salih, Eds., Growth Pole Strategy and Regional Development Policy, 79-120. New York. Pergamon.

Scott, James C.

1976 The Moral Economy of the Peasant. New Haven. Yale.

Simkins, Paul, and Frederick Wernstedt

1971 Philippine Migration to the Digos-Padada Valley. Monograph No. 16. Yale Southeast Asian Studies. New Haven.

Stark, Oded

1981 The Asset Demand for Children During Agricultural Modernization. Population and Development Review, 7:671-675.

Stohr, Walter B. and D.R.F. Taylor

1981 Development from Above or Below? New York. Wiley.

Takahashi, Akira

1969 Land and Peasants in Central Luzon. Tokyo. Institute of Developing Economies. Republished by East West Center. Honolulu.

Todaro, Michael

1976 Internal Migration in Developing Countries. Geneva. International Labour Office.

United States Agency for International Development (USAID)

1984 Effects of Recent Developments on the Coconut Farmers. Information Memorandum. Office of the Director, USAID/Philippines. Manila.

Uphoff, Norman T. and Milton J. Esman

1974 Local Organization for Rural Development: Analysis of Asian Experience. Center for International Studies. Cornell University. Ithaca.

Vance, Rupert B. and Sarah Smith

1954 Metropolitan Dominance and Integration. In P.K. Hatt and A. K. Reiss, Eds., Cities and Society, 103-119. Glencoe. Free Press.

Von Pischeke, J.D., Dale W. Adams and Gordon Donald

1983 Rural Financial Markets in Developing Countries. Baltimore. Johns Hopkins.

Wernstedt, Frederick and Paul Simkins

1965 Migrations and the Settlement of Mindanao. Journal of Asian Studies, 25:83-103.

Wickham, T.H., R. Barker and M.V. Rosegrant

1978 Complementarities among Irrigation, Fertilizer and Modern Rice Varieties. In Economic Consequences of the New Rice Technology. International Rice Research Institute. Los Banos.

World Bank

1975 The Task Ahead for the Cities of the Developing Countries. Working Paper No. 209. Washington.

1976 The Philippines: Priorities and Prospects for Development. A World Bank Country Economic Report. Manila. National Economic Development Authority.

1980 Aspects of Poverty in the Philippines: Review and Assessment. Report No. 2984-PH. Country Programs Department. East Asia and Pacific Regional Office. Washington.

1982 World Development Report. New York. Oxford.

1982 The Philippines: Housing Finance. East Asia and Pacific Regional Office. Washington.

1983 Philippines: Agricultural Credit Sector Review. Report No. 4117-PH. Projects Department. East Asia and Pacific Regional Office. Washington.

1983 Thailand: Rural Growth and Employment. A World Bank Country Study. Washington.