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DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
Washington, D.C. 20523

CAPITAL ASSISTANCE PAPER

Proposal and Recommendations
For the Review of the
Development Loan Committee

PHILIPPINES - RURAL ROADS LOAN

AID-DLC/P-2059

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DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20523

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AID-DLC/P-2059

November 20, 1974

MEMORANDUM FOR THE DEVELOPMENT LOAN COMMITTEE

SUBJECT: Philippines - Rural Roads Loan

Attached for your review are recommendations for authorization of a loan to the Government of the Republic of the Philippines ("Borrower") of not to exceed Fifteen Million Dollars (\$15,000,000). The proceeds of this loan will be used to reimburse the Borrower for up to seventy-five percent of the peso costs of a program of subprojects executed by participating Provinces to construct or improve approximately 750 kilometers of rural roads and 2400 linear meters of related bridges in provincial areas of the Philippines.

This loan proposal is scheduled for consideration by the Development Loan Staff Committee Wednesday, November 27, 1974. Also please note your concurrence or objection is due by close of business Tuesday, December 3, 1974. If you are a voting member a poll sheet has been enclosed for your response.

Development Loan Committee
Office of Development
Program Review

Attachments:

Summary and Recommendations
Project Analysis
ANNEXES - I-XIV

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SUMMARY AND RECOMMENDATIONS

November 21, 1974

1. Borrower/Beneficiary - The Government of the Republic of the Philippines (GOP) will be the borrower. The executing agencies will be (a) the Department of Local Government and Community Development (DLGCD)/Provincial Development Assistance Project (PDAP) and (b) the fourteen to twenty-two provinces in which the project will be implemented.
2. Amount of Loan - \$15.0 Million.
3. Terms - Repayment within 40 years, including a ten year grace period; interest at 2% annually during the grace period, and 3% thereafter.
4. Purpose - To assist the GOP in its efforts to improve the economic and social conditions in the rural areas by providing all-weather roads capable of transporting agriculture inputs, products and other goods, and by providing a more effective means of communications between the rural areas and access to medical, recreational and educational facilities.
5. Project Description - The project consist of the improvement/construction of rural roads and bridges in the provinces. It is estimated that under this project not less than 750 kilometers of rural roads and 2400 linear meters of bridges will be improved/constructed in 14-22 participating provinces over a period of 3 years.
6. Project Costs and Financing Arrangement - The project will originally be financed by the provinces themselves by means of self-generated or local bank loan funds. Upon completion of the identifiable segments of road to agreed upon plans (sub-projects) the DLGCD will reimburse the provinces an amount not to exceed 75% of the previously agreed project cost estimate from funds provided by the Central Government from Presidential Discretionary Funds which will be generated from a percentage of the annual Bureau of Internal Revenue collections. The U.S. will in turn reimburse the GOP (not to exceed 75% of the original project cost estimate) by means of a dollar credit in a Special Letter of Credit (SLC) in a U.S. bank. The GOP may utilize the SLC for U.S. purchases.

Based upon the estimates provided by the proposed 14 participating provinces, this project permits qualified provinces to execute four times as much local road and bridge work as they could perform with their own resources. And it is a net add-on to road work otherwise possible as it does not drain off pesos from the fixed stock of national budget resources allocated for Department of Public Highways project.

7. Other Source of Financing - While other donors are contributing to various road projects in the Philippines (IBRD, ADB, Japanese, Australian), they are directing their efforts primarily to major national highway projects. The total length or amount of rural roads in need of improvement/construction greatly needs the total funds currently available for this purpose, and in particular exceeds the local cost financing ability of the Philippine Treasury.
8. Export-Import Bank Clearance - Received.
9. Country Team Views - The Country Team recommends approval of this loan.
10. Issues - None.
11. Statutory Checklist - All statutory criteria have been satisfied.
12. Recommendation - Authorization of a loan to the Republic of the Philippines to reimburse the GOP for not to exceed 75 of the cost of the project set forth in the draft authorization attached.

Capital Assistance Committee

USAID:

Chairman	- Richard Dangler
Loan Officer	- Arthur Thivierge
Engineer	- Royal Cline
Provincial Development Officer	- William Fuller
USAID Staff Economist	- Rene Ruivivar
Consultant-Transportation Economist	- Charles Joyce

AID/W:

Chairman	- Alexander R. Love
Loan Officer	- Laurance W. Bond
Engineer	- C. H. Groceman
Attorney	- Stephen Tisa
Desk Officer	- Dennis Chandler
Technical Development	- Donald Yeaman

SECTION I - THE PROJECT

November 21, 1974

A. Project Description:1. Goal and Purposes

The goal of this project is to stimulate development of the rural areas of the Philippines which have the self-help capacity to administer rural road construction. Improved roads will achieve this goal by improving all public and private services dependent upon transportation and in particular by stimulating agricultural production by reducing transportation cost facilitating the movement of agriculture outputs to the market place. The areas chosen for implementation of the project are essentially agricultural areas. The first fourteen provinces in this project produce 37 and 26 percent of the total Philippine rice and corn output respectively. (See Annex III).

The specific purpose of the project is to increase the income of small farmers by increasing his agricultural outputs and to improve his living conditions by making him more accessible to governmental and private sector institutions and facilities, particularly health, education, recreation and social agencies. The Project selection criteria described in Sections I A 3 (later) precludes the possibility of this project financing rural roads for the benefit of large farms, such as sugar cane plantations.

2. Size and Costs

It is estimated that a \$15 million loan (U.S. \$- ₱6.66 therefore \$15 million = ₱100 million) will be sufficient to reimburse the GOP for up to but not more than 75% of total cost for the improvement/construction of approximately 750 kilometers of roads and 2400 linear meters of bridges. Details of what items constitute the total project cost and which items are designated as eligible for loan reimbursement are given in Section II D, Disbursement Procedures.

Depending upon the design standard, as justified by the technical soundness appraisal and economic analysis, it is estimated that the cost per kilometer of road predominantly will be in the range of ₱40,000 to ₱70,000. Hard surfacing may be justified for a few high density (heavily travelled) roads at a cost of up to ₱250,000/kilometer. The total cost per linear meter of bridge construction will be in the range of ₱3000 to ₱15,000 depending upon the design and type

of material (timber or concrete) used in construction. While the mix of road to bridges may vary as sub-projects are accepted for project implementation, funds will be tentatively allocated to each province as shown in Table III. The planned allocation of funds is based upon (1) past performance of provinces in implementing the 1972 flood rehabilitation project and the S/P and (2) in consideration of the individual province's ability to initially finance the project and cover counter-part cost. The total project cost in pesos is estimated at P 135 million with P100 million equivalent to be reimbursed by the loan. The provinces will provide the approximately P35 million.

The total loan funds will be disbursed over a maximum three year period.

Table I

ROADS - REIMBURSABLE COST (#000's) - KILOMETERS

Standard	Year - 1	Year - 2	Year - 3
	# x KM	# x KM	# x KM
Improved Gravel	40 x 98 = 3920	44 x 113 = 4972	48 x 139 = 6672
New Gravel	70 x 86 = 6020	77 x 109 = 8393	85 x 132 = 11,220
DBST	120 x 26 = 3120	132 x 33 = 4356	145 x 41 = 5,945
Asphalt or Cement Conc.	250 x 10 = <u>2500</u>	275 x 13 = <u>3575</u>	303 x 15 = <u>4,545</u>
Totals =	# 15,560	#21,296	#28,382

Table II

BRIDGES - REIMBURSABLE COSTS (#000's) METERS

	Year - 1	Year - 2	Year - 3
	# x KM	# x LM	# x LM
Concrete	15 x 500 = 7500	18 x 600 = 10,800	21.60x 700=15,120
Timber	3 x 150 = <u>450</u>	3.5 x 200 = <u>700</u>	4 x 250= <u>1,000</u>
Totals =	# 7950	# 11,500	# 16,120

Road costs were escalated at 10% per year. Bridge costs were escalated at a higher rate of 20% per year because of the larger component of both domestic and imported commodities (i.e., steel, cement and lumber) used in construction and which have shown a greater inflationary rate vis-a-vis labor costs.

The quantities of roads and bridges have been increased each year to provide for participation in the project of four additional provinces each year.

3. Selection Criteria

To qualify for financial assistance under this project a province must:

(a) have been in the PDAP program for at least two years, which is considered the minimum period necessary to develop the management and engineering capability necessary to properly implement the construction program.

(b) have a provincial development staff capable of conducting economic type/criteria studies for sub-project planning, selection and evaluation.

(c) have a Capital Improvement Program (see Annex IV).

(d) have a Road Network Program (see Annex IV).

(e) have a functional Materials Testing Laboratory.

(f) have a Provincial Engineer's Office qualified to handle all aspects of construction including design, contracting and implementation.

(g) have a functional Provincial Equipment Pool with a deadline rate of less than 25%.

(h) have prepared a Provincial Socio-Economic Profile which includes the Agriculture Sector (see Annex IV).

Further, for a particular road segment to qualify for financing under this project it must:

(a) Contribute to the increased agricultural production of its influence area.

- (b) Serve areas where the existing or planned use of the area is predominantly agricultural or in support of small or medium scale industries, agro business, or commerce. The main beneficiaries of the sub-project should be small farmers, i.e., those operating farms with individual areas of less than three hectares. Sub-projects must average at least ten farms of less than three hectares within its influence area per kilometer of length. In the case of the opening up of new areas, planned occupancy must comply with the above.
- (c) Not lead to a dead-end or to impassable roads at both ends;
- (d) Lead to or connect to a road network that leads to a poblacion (rural urban center, market place);
- (e) Meet these preliminary engineering criteria:
 - i) Roads should link on at least one end to a road of equal quality to the nearest market town or poblacion. (It will be assumed that national roads are higher quality.)
 - ii) Structures should not be of higher quality than the minimum provincial structure between the project site and the nearest market town or poblacion following the normal traffic route between the two locations.

DLGCD will certify that each province and each sub-project meets the criteria listed above before authorizing a province to undertake preparation of final plans and specifications. The DLGCD will contract with local A & E firms which will provide independent monitoring of the design and construction as well as provide a certification, for purposes of reimbursement, that work was completed as agreed.

4. Eligible Provinces and Tentative Reimbursable Amounts

The following Table III lists the provinces proposed for participation in the project and the tentative reimbursable amounts proposed for each of the three years of the project. The tentative allocations are based upon the ability of the provinces to originally fund their respective projects and, provide counterpart funding and the capability of the province to implement the project by their performance to date under the PDAP program.

TABLE III
TENTATIVE ESTIMATE
FIXED COST REIMBURSABLE FOR COMPLETED PROJECTS
(P Million)

PROVINCE	FY 76	FY 77	FY 78	TOTAL
La Union	₱1.0	₱1.0	₱1.0	₱ 3.0
Pangasinan	2.0	2.0	2.5	6.5
Zambales	1.0	1.5	1.5	4.0
Bataan	1.0	1.5	1.5	4.0
Pampanga	3.0	3.0	4.0	10.0
Bulacan	3.0	3.0	4.0	10.0
Batangas	1.0	1.5	2.0	4.5
Camarines Sur	1.0	2.0	2.0	5.0
Albay	*	*	1.0	1.0
Sorsogon	*	1.0	1.0	2.0
Mindoro Oriental	1.0	1.0	1.0	3.0
Aklan	*	*	1.0	1.0
Capiz	*	1.0	1.0	2.0
Antique	*	1.0	1.0	2.0
Iloilo	2.0	3.0	4.0	9.0
Samar	*	*	1.0	1.0
Misamis Oriental	2.0	2.5	2.5	7.0
Agusan Norte	*	*	1.0	1.0
Lanao Sur	*	1.0	1.0	2.0
So. Cotabato	2.5	3.0	3.5	9.0
Davao (Norte)	2.5	3.0	3.5	9.0
Palawan	1.0	1.5	1.5	4.0
Total	₱24.0	₱33.5	₱42.5	₱100.0

i.e., Systematic Programming of Rural Economic and Agricultural Development. This was a very successful program and in 1968 it was expanded into the provincial development program as it exists today. At that time, the GOP created the Provincial Development Assistance Project (PDAP) and attached it to the National Economic Council (NEC), the predecessor agency of the National Economic and Development Authority (NEDA). In December 1972 PDAP was transferred to the Office of the Executive Secretary of the President. It is now planned to phase PDAP into the Department of Local Government and Community Development (DLGCD). The DLGCD is a relatively new government department responsible for improving and strengthening of operations of local government and community development. Its main objective is to accelerate national and local government participation in the social and economic development of the nation. This history of USAID's assistance to provincial development reflects the importance placed upon such assistance by the GOP. The PDAP/USAID efforts in provincial development received widespread GOP attention with the implementation of the very successful flood rehabilitation program in eleven provinces following the devastating July/August 1972 floods. Eight of the eleven provinces were PDAP provinces. Under the flood rehabilitation program approximately \$11 million have been obligated and reimbursed to the provinces through the cost reimbursement procedures. The flood rehabilitation program has provided USAID and the GOP a solid base of experience which will be utilized in implementing this project. Currently the PDAP/USAID covers twenty-two provinces and is focused upon activities designed to develop and institutionalize the capabilities of the provinces in the areas of planning, fiscal management and infrastructure development. Through the infusion of technical assistance, training, finances and equipment, fourteen of the twenty-two PDAP provinces have already attained the capability to implement rural road projects and the other eight provinces will qualify in time to participate in this three year project. (See Annexes VII, VIII and IX).

This project developed out of the decision by the GOP to initiate a rural roads program. Based upon current level of development and experience in the PDAP provinces, it was proposed that PDAP and the provinces would be the vehicles for implementing this project. Provinces outside of PDAP do not have the planning and engineering capabilities to implement such a project without considerable inputs of these elements. The discussions within the GOP and between the GOP and USAID resulted in a formal loan application from the Office of the

5. Government Contribution to Rural Roads Program

As noted in Section I, the government has programmed 29,000 km of rural roads in the current four-year plan. To sustain such a program there will need to be a substantial transfer of resources from the central government to the provinces both for construction and maintenance.

The GOP has already taken a major step in this direction with the passage of Presidential Decree No. 17, amending the Philippines Highway Act of 1953.

This decree provides for, among other things, increasing the availability of maintenance funds by allocating 82% of the Highway Maintenance Fund (HSF) to national and provincial roads.

Under this revised act, the provincial governments, cities and municipalities will receive a direct annual maintenance contribution per kilometer of roads and on a continuous basis. This action is probably more important in the long run than central government transfers for new construction. Without such assistance, the provincial road network would likely pose a rapidly expanding budget drain on the local areas and presage a return to the progressive deterioration of the provincial roads.

In the proposed project the central government will be contributing an estimated \$504,000 per year for maintenance of the roads constructed. This equates to \$10.1 million over the estimated 20 year life of these roads.

In addition to the maintenance contribution, the proposed loan is the first time the GOP has borrowed externally for, and directly transferred to the provincial governments a substantial block of resources for rural roads. Most notably in this case, this transfer of funds is for projects implemented by the provincial governments.

Since these funds will be transferred to the provinces on a grant basis, the central government will be shouldering 75 percent of the cost of the roads and correspondingly the foreign exchange risks and debt service obligations. The grant transfer (rather than a loan to the provinces approach practiced in other countries) makes sense in the Philippine context, as the provinces will not be able to assume a major debt service payment obligation to the central government.

Increased taxes and other revenue resulting from road improvements will accrue to the provincial coffers and facilitate an expanded joint central government/provincial funded program in the future. Provinces with greater financing capabilities will probably have to shoulder a larger percentage of costs in future programs, thereby providing a skewing of central government contributions to the lower income provinces.

In addition to the above aspects, the central government is expected to make a direct budgetary contribution of ₱7.0 million to the project to finance consulting engineering services.

B. Project Background

1. USAID Involvement with PDAP and Origin of the Project

In 1966-67 USAID provided assistance to two provinces, Laguna and Tarlac under a program called "Operation Spread",

Executive Secretary of the President to AID on September 9, 1974. The text of the loan application is part of this CAP, Annex XII.

2. Project Review Paper (PRP)

The PRP for this project was sent to AID/W on August 29, 1974. Due to the reorganization of the Agency and its attending difficulties, the PRP was not reviewed and approval to prepare a Project Paper given until November 1, 1974. However, from an informal review and through an exchange of correspondence between the Mission and AID/W on the project, the issues that were anticipated to be raised in a formal review were discussed and addressed in the preliminary preparation of this Project Paper prior to approval.

The review of the PRP raised three main points. The first was a question of the support being given to the project by the GOP, second was on the criteria for selection of roads to be developed, and thirdly on who are the beneficiaries. The project committee felt that the project paper prepared in the Mission was sufficiently far enough along in addressing these issues that it was possible to immediately prepare a final draft of the paper for consideration.

C. Project Justification

1. Place of the Project in the GOP Development Program

The following is a statement by the GOP National Economic and Development Authority relating to the GOP Development Program:

"The 4-Year Development Plan spells out the over-all development objectives of the economy, namely: (1) maximum feasible economic growth, (2) maximum labor force utilization, (3) more equitable distribution of income and wealth, (4) regional development and industrialization, and (5) promotion of social development. The Plan also broadly indicates that to realize these objectives government efforts and resources shall be directed towards the implementation of priority projects which are largely supportive of the productive sectors with greater stress laid on the agricultural sector.

"Transportation, which serves as the pipeline that interlinks all the activities necessary to achieve the planned objectives has been slated to respond and provide the necessary support particularly in the following aspects:

"a. mobilization of production inputs, especially agricultural such as fertilizer, seeds, extension service, etc.;

"b. transportation of products to markets, storage, and population commercial and industrial centers; and

"c. facilitation of the carrying out of vital governmental social services.

"Despite substantial additions and improvements made recently to the highway network, its present kilometerage of about 75,000 remains deficient in both its geometric and structural standards and its length. Its present length represents only 0.37 kilometer per 100 hectares of arable lands as compared with the accepted standard of 1.00 kilometer per 100 hectares or a deficiency of about 125,000 kilometers. Significantly, the shortage is in the rural roads which link production areas with markets, storage, processing centers and/or main road. This has been recognized as one of the bottlenecks in the government's drive to intensify agro-industrial development that contribute to low per capita income even in areas possessing rich resource potentials."

The 4-Year Infrastructure Program

"In the 4-Year Infrastructure Program which is incorporated in the 4-Year (FY 1974-FY 1977) Development Plan of the Government, the transportation sector has been given the highest percentage allocation of investment (36%) with highways receiving the biggest share.

"Of special concern are the construction/improvement/rehabilitation of rural roads mostly feeder roads aggregating not less than 23,000 kilometers. These are the farm-to-market roads and other minor roads that would link these rural roads to existing and/or on-going highways, ports and airports.

"While some of these rural roads are components of Integrated Area Development Projects and others are integral parts of special agricultural or industrial projects, some are or will be interconnected with inter-regional and regional trunklines linking major population, processing and production centers.

Contribution to Economic Growth

"As vital links between production areas and market centers, the feeder road system provides the opportunity to uplift rural incomes and achieve self sufficiency in food production. Faster and wider distribution of agricultural and industrial inputs and products is facilitated, thus serving as incentives to increased production and greater market orientation of the rural population. In the face of worldwide food and raw material shortages, the feeder roads assume a more significant part in the overall strategy to increase food production and combat inflation by minimizing the friction in the flow of goods between production and consumption points.

Greater Employment Opportunities

"The labor intensive nature of the construction of rural roads affords the expansion of employment opportunities in the rural areas, thus reducing unemployment and underemployment of the rural labor force. The multiplier effects are readily seen not only from the standpoint of augmented incomes but also from the standpoint of a more equitable distribution of income.

Income Redistribution

"The rural road program is also in line with the income redistributive objective of the Four-Year Development Plan. Government expenditures on feeder roads would tend to benefit directly the depressed rural areas thus redistributing wealth over a wider population base. As more barrios and municipalities are tied by stretches of feeder roads, living standards of the rural population are upgraded.

Regional Development

"The current stress on regional development seeks to spread the benefits of economic growth over a broader geographical area. By interlacing the countryside with rural roads, linkages between population centers are created facilitating the flow of goods and people, increasing rural incomes, and reinforcing the regional development efforts of the country.

Promotion of Social Welfare

"Finally the rural road network uplifts the social welfare of the rural folks. Services like health, nutri-

tion, education, etc. are provided more readily. Doctors and nurses may reach even the remotest barrio. Teachers and family planners may educate the people in all aspects of citizenship training and population control thus enhancing the social welfare of the people.

"As one of the conduits by which the fruits of economic progress may filter down to the greater mass of the people, the rural road program is a significant ingredient to the achievement of national development goals."

2. Relationship to Agrarian Reform

There are approximately one million rice and corn tenant farmers in the Philippines tilling 1.8 million hectares of land. This is in addition to approximately 600,000 owner-tillers who are farming less than 2 hectares each.

In October 1972, the Government of the Philippines initiated an Agrarian Reform program which would transform the nation's rice and corn tenants into amortizing owners. These tenant farmers till an average of about 1.8 hectares. After making their share payments, they are left with little more grain than is required to feed their families until the next harvest.

The Philippine Agrarian Reform program is designed to do more than transform tenants into owners of the land they till. It seeks to provide these farmers with a support system to move them beyond subsistence. It is therefore a development program for small farmers rather than simply a land transfer program. The support system being developed is to provide farmers with production credit, extension services and access to inputs and markets.

The GOP land distribution program has been carried out in stages, beginning with estates exceeding 100 hectares. The program was then expanded to cover estates in the 50-100 hectares category and the 24 to 50 hectare category.

Progress was exceptional in the first year of the program with almost 15 percent of rice and corn tenants reported to have been made program beneficiaries. Progress in the second year was less impressive with less than an additional three percent of the tenants benefiting. The Government attributes the slow-down mainly to the emergence of resistance on the part of middle class landlords who are now subject to the reform effort as smaller hectarages have been brought under the program. Though this may be a major reason, it is also probable that the program tried to move too rapidly in the first and second years. Efforts have been delayed while bureaucratic and paper work bottlenecks of the first year have had to be unblocked. Significant progress has been made in developing more effective bureaucratic procedures and foreign observers feel that the delays will have been overcome by year's end.

More importantly perhaps, President Marcos is expected to re-affirm the will of the government to carry out this program. It is anticipated he will: (a) authorize the program to proceed from the 24-7 hectare level; (b) authorize the publication of program implementing regulations which have been designed to effectively deal with problems which slowed the program in the second year, and (c) will seek to overcome landlord opposition to the program by authorizing more liberal landlord compensation terms.

As stated above, the GOP intended the program to not be simply a land transfer program but that it be a program of small farmer development. Progress in developing a small farmer support system tailored to the needs of program beneficiaries has been very good. Non-collateral, small farmer loans have increased tenfold since the program's initiation and now exceed one-half billion Pesos. Credit is currently limited only by the capabilities of lending institutions to handle loans and not a shortage of funds. The government has developed a four-year Rural Bank Development Program which would, among other things, increase the number of rural banks by 50% (to a total of 1,000 institutions) and upgrade existing bank management capabilities to enable them to manage larger portfolios. The program seeks to make the rural banking system capable of meeting virtually all credit needs of the nation's small farmers within five years.

Progress in the farmer organization, the Samahang Nayon Program, which will form the base for an effective small farmer cooperative system, has also been exceptional. Almost 500,000 prospective land reform beneficiaries have been organized into barrio associations and have had over one year of training in such subjects as agricultural production, use of credit, cooperative principals, etc. These farmers will graduate from this comprehensive 64 week course by the end of December 1974, and will be encouraged to form themselves into multi-municipality marketing cooperatives. The government has, in the meantime, recruited and trained a cadre of professional cooperative managers to operate the prospective marketing cooperatives.

The farmer associations, although not yet eligible to form themselves into cooperative, have assisted the banking community in loan distribution and collection, and assisted in the distribution of the farm inputs and ~~assembling~~ of produce for marketing.

As part of this program, the government has increased the number of agricultural extension agents to over four thousand. All have agricultural degrees and most have now been trained in the production of high yielding rice or corn varieties.

In addition to these services, the government has begun developing plans to see that program beneficiaries have access to irrigation and roads. All projections of costs of the agrarian reform program have included estimates of the cost of such new infrastructure and have identified this as an area where foreign assistance would be sought. The rural roads project presented here is being incorporated as an integral part of the overall Agrarian Reform Project.

In each participating province of this project, the Provincial Development Staff (PDS) will have primary responsibility for the preparation of an Annual Implementation Plan (AIP). In their capacity as the provincial planning staff, they are responsible for coordinating all local programs with the national activities in their particular provinces.

Agrarian Reform is a high priority program of the GOP that has some common goals with the rural roads program. The PBS, as a matter of course, closely coordinates provincial programs with the needs of the Agrarian Reform effort in their province. This local planning element permits the maximum utilization of rural inputs to serve the needs of the small farmers benefitting from the Agrarian Reform program.

Rural roads are one key to the success of this government initiative. Banks do not provide loans to farmers whom they can not supervise. Extension workers cannot spare the time required to visit isolated barrios. Where roads do not exist, fertilizer must be brought to the farm on inefficient draft-animal sleds and production surpluses brought to the market the same way. Thus, the economic margins of the farmer are squeezed between both increased input costs and increased marketing costs.

While the proposed loan will support the Agrarian Reform program, it will benefit all small farmers whether tenant or owner. The isolated farmer is more susceptible to risks than those with roads. Where roads exist, farmers have the option of machine tilling, threshing and drying. Without such access, planting may be delayed and crops harvested in rainy weather may deteriorate before they can be processed.

Finally, the isolated farmer has little incentive to produce crops or animals beyond what his family can consume. His isolation gives him no access to marketing information and thus, he proceeds to the market ignorant of prices and is forced to either take what is offered or face the alternative of carrying his commodity back over the roadless fields to his farm.

In short, the small farmer beneficiary who has access to roads holds one of the crucial keys needed to develop his enterprise into something more than subsistence activity. The beneficiary without such access must continue to face the prospect of a hand-to-mouth existence.

3. Place of the Project in the USAID Country Program

The Philippine Government has recently re-examined its development program and plans and determined to continue to assign first priority to projects that are directly supportive of food production and distribution efforts. Such projects are aimed both at increasing small farmer rice and corn productivity through the application of improved production inputs and extension services and at assuring increased benefits to the farmer by enabling him to move his production to market on a more timely and cheaper basis. At present the two-way traffic of goods and services required to implement this small farmer centered strategy is severely inhibited by the inadequacy of the transport system available to the small farmer. Accordingly, the GOP has determined that secondary and rural roads directly supportive of the food production and distribution programs aimed at benefitting the small rice and corn producers should be pushed forward.

USAID has focused its development efforts on the rural poor, seeking to overcome the problems associated with rural poverty through a multi-project approach. The core of the program is USAID's Provincial Development Assistance Project (PDAP) which seeks to develop the capacity of local governments to plan, obtain resources for, and implement development projects. Participating provinces have demonstrated their capacity to undertake development projects in the flood rehabilitation program and later, GOP/USAID supported programs. They have, as detailed elsewhere in this paper, the key role in implementing the rural roads program.

The Provincial Development Assistance Project is supplemented by and supportive of most other USAID programs. The relationship of the Provincial Development Assistance Project and other mission programs and the interrelationship of the rural roads project is as follows:

Family Planning

The USAID supported family planning program has moved rapidly over the past eight years. It has been highly successful in most urban areas but less effective in most rural areas. In provinces where the program has been made a key part of the Local Development Project (PDAP) (e.g. Laguna and Cogayan de Oro), however, the program has also proven to be effective in rural areas. A limiting factor of the program, however, is access. Obviously, program participants must be able to get to medical personnel and contraceptive supplies. New roads will give large numbers of the poor access to the benefits of this program.

Nutrition

As with family planning, effective nutrition programs have been more easily established in the urban than the rural areas. Again, where the programs have been linked to the Local Development Project (PDAP) (e.g., Cotabato and Laguna), they have prospered. Here again access has been a limiting factor of the program. Now rural roads can significantly contribute to overcoming this problem.

Small Farmer Income and Production Project and Agrarian Reform Project

The quality of both of these programs in any given province is directly related to the support provided by local government units. The central government has been willing to delegate responsibility for program implementation to local governments in both crop production and land reform when local governments have demonstrated the capability to manage them. Both programs seek to improve the lot of the small farmer through the development of improved support systems. A limiting factor, as detailed elsewhere, is access. To increase income, farmers must increase production and be able to market this production. Farmers without roads are generally denied the opportunity to increase incomes because they have access to neither inputs nor markets.

Aquaculture

This project seeks to increase protein availability through large scale fish production in ponds. Land suitable for ponds are, generally wasteland. As in other kinds of agricultural production, the potential of this project is limited by access. Roads are needed to bring in necessary equipment to construct, operate and maintain ponds, and to provide access to markets.

Bicol River Basin Development Project

This project, the most ambitious of the local development efforts, seeks to bring about the integrated development of a river basin. It incorporates all of the mission projects listed above as well as flood control and other activities. Road construction was determined by joint GOP/AID feasibility team to be the first priority in carrying out the development plan. Every aspect of the program was found to be limited by the problem of access. Priority needs will be met under this rural roads project while the development of a comprehensive road project while the development of a comprehensive road network to meet full project needs will be included in a separate loan package for an integrated development effort.

Rural Electrification

An integral part of the local development effort is rural electrification. As the national electrification effort expands, rural dwellers will be brought more readily in the mainstream economic life of the country. Electric power encourages the development of agro-industrial activities and cottage and small-scale industries. Irrigation can be brought within the means of small farmers through the use of electric pumping in small-scale irrigation projects. However, this development has less meaning and impact without a road network. Indeed it is delayed or does not take place without roads.

Roads provide an entry for electric power as the electric distribution right-of-way generally follows the road. Construction and maintenance are made easier as they provide ready access to the lines. Electric power must be accompanied by roads if meaningful development is to take place and productive enterprise encouraged. Production without access to markets is futile.

SECTION II PROJECT ANALYSIS

A. Borrower and Implementing Agency

1. Borrower

The Republic of the Philippines will be the Borrower of this Loan. The GOP will provide the DLGCD with the peso resources required for DLGCD's portion of the project cost from what is called Discretionary Funds. The Discretionary Funds is provided by Presidential Decree - 144 which states that 5 percent of total resources collected by the Bureau of Internal Revenue will be used at the discretion of the President. The same Presidential Decree provides that the provinces set aside 20 percent of their revenue collections for development projects. This is **one** source of funds that will be used to cover the provinces' portion of the project costs.

2. Implementing Agency

The GOP will implement the project through the Department of Local Government and Community Development. As stated earlier USAID has been working since 1968 with the Provincial Development Assistance Project staff. The PDAP organization with a complement of thirty professional employees who are primarily specialists in the fields of planning, finance and engineering will be phased into the DLGCD. A professional economist has been detailed from DLGCD to PDAP to assist in the training of the provincial staffs in the sub-project economic justification methodology. Eight of the fourteen provincial staffs have proven their capabilities on the Flood Rehabilitation Program and six on the Special Infrastructure Program (see Annex IV). The fourteen provinces have a combined total of 173 graduate engineers and will be augmented by the PDAP staff.

3. Sub-Project Administrative Procedure

Over the years of working with PDAP and the provinces, USAID has devoted considerable effort to institutionalizing the planning, financing and implementation of projects. Through these efforts detailed administrative forms and procedures have been developed. These have now been in use for several years and have proven to be useful in providing the methodology as well as adequate control, reports and evaluation. These procedures are further detailed in Section II D.4,

Implementation. The Administrative Procedures are contained in a comprehensive manual. The manual covers all the details necessary to implement the Rural Road Project consistent with AID goals and objectives. However, the manual is too lengthy to be included as part of this CAP, but is available for review in EA/CD.

B. Beneficiaries

One of the major problems in attempting to evaluate the potential beneficiaries of any program in the rural areas of the Philippines is the comparative lack of statistical information on these areas. This is particularly true as it applies to the distribution of income and wealth and patterns of loan use in agriculture and the rural areas generally. Our concern in this regard is supported by the extensive International Labor Organization report "Sharing in Development, A Program of Employment, Equity and Growth for the Philippines" and by the recent IBRD economic team in its efforts to provide analysis in this area.

A general breakdown of the distribution of the "rural poor" (in this case the lower 40 percent income bracket) was completed by the recent IBRD economic team. The tabular summary of this analysis is shown on the following page by Region. A location map showing the provincial composition of each region is also included.

The bottom 40 percent of Filipino families receive approximately 12 percent of the national income and include 15 million people. 12 million of these people reside in rural areas with the majority living in farm households. In comparison, the top five percent of the population received 25 percent of the income.

As indicated in the tables, income levels and related incidence of poverty vary considerably throughout the Philippines. Ilocos, Cagayan Valley, Bicol and the Eastern Visayas are high in the incidence of poverty. Southern Tagalog, Eastern Visayas and Southwest Mindanao stand out in terms of absolute numbers. The Central Luzon area, while high in median income, nevertheless has a high incidence of rural poor (28.0% in the lower 40%) and accounts for 12.5% of the rural families in this income bracket.

In selecting the provinces to be included in the proposed program, the GOP and USAID have had to balance the factors of distribution and incidence of poverty against other key project criteria, e.g. (a) provincial government competence and available equipment pools; (b) association with agricultural land - particularly rice and corn farmers; (c) the related nationwide focus of the agrarian reform program which this project partially supports; and (d) other supporting government programs which enhance the prospect that the roads constructed will in fact support an integrated GOP effort rather than an isolated activity.

The rural road project proposed herein will be implemented in eight of the ten regions of the Philippines in which reside approximately 85 percent of the 40 percent target population. Approximately 25 percent of the 12 million rural poor included in the bottom 40 percent are located in the twenty-two provinces included in the proposed program.

Regional Population Distribution, Family Income
and Distribution of the Bottom 40 Percent in 1971

<u>Region</u>	1971 Population (mid-year)		Family Income (Pesos)			Distribution of Bottom 40% of Families		
	(million)	%	Mean	Median	C/B (%)	No. of People (Millions)	%	D/A (%)
	<u>A</u>		<u>B</u>	<u>C</u>		<u>D</u>		
<u>Philippines - Total</u>	<u>37.92</u>	<u>100.0</u>	<u>3736</u>	<u>2454</u>	<u>65.7</u>	<u>15.17</u>	<u>100.0</u>	<u>40.0</u>
<u>Northern Luzon</u>	<u>3.39</u>	<u>8.9</u>	<u>2890</u>	<u>1741</u>	<u>60.2</u>	<u>1.87</u>	<u>12.4</u>	<u>55.2</u>
Ilocos	1.87	4.9	3299	1813	55.0	0.98	6.5	52.4
Cagayan Valley	1.52	4.0	2390	1652	69.1	0.89	5.9	58.6
<u>Central Luzon</u>	<u>6.68</u>	<u>17.6</u>	<u>4895</u>	<u>3556</u>	<u>72.7</u>	<u>1.61</u>	<u>10.6</u>	<u>24.1</u>
City of Manila	1.40	3.7	7785	5202	66.8	0.10	0.6	7.1
Central Luzon	5.28	13.9	4127	3119	75.6	1.51	10.0	28.6
<u>Southern Luzon</u>	<u>10.16</u>	<u>26.8</u>	<u>3868</u>	<u>2634</u>	<u>68.1</u>	<u>3.81</u>	<u>25.0</u>	<u>37.5</u>
Southern Tagalog ^{/a}	7.12	18.8	4332	2960	68.3	2.25	14.7	31.6
Bicol	3.04	8.0	2784	1874	67.3	1.56	10.3	51.3
<u>Visayas</u>	<u>9.38</u>	<u>24.8</u>	<u>2818</u>	<u>1930</u>	<u>68.5</u>	<u>4.68</u>	<u>30.9</u>	<u>49.9</u>
Western Visayas	3.86	10.2	3206	2332	72.7	1.50	9.9	38.9
Eastern Visayas	5.52	14.6	2548	1651	64.8	3.18	21.0	57.6
<u>Mindanao</u>	<u>8.31</u>	<u>21.9</u>	<u>3382</u>	<u>2411</u>	<u>71.3</u>	<u>3.20</u>	<u>21.1</u>	<u>38.5</u>
NE Mindanao	3.14	8.3	3062	2186	71.4	1.36	9.0	43.3
SW Mindanao	5.17	13.6	3577	2549	71.3	1.84	12.1	35.6

Source: (a) Population - by interpolating 1970 Census data.

(b) Mitaes, Tito A. and I. C. Belarmino, "Some Notes on the Sources of Income Disparities among Philippines Families," Journal of Philippine Statistics, Vol. 24, No. 4, 4th quarter 1973, P xxv-xxix.

(c) Distribution of bottom 40 percent of families based on mission calculations using the 1971 household income-expenditure survey data.

^{/a} Includes part of the Greater Manila Area.

62-48-71

CLASSIFICATION OF PROVINCES BY GEOGRAPHICAL REGIONS 1972

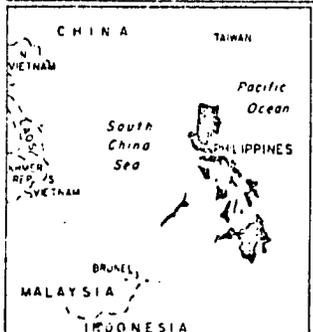
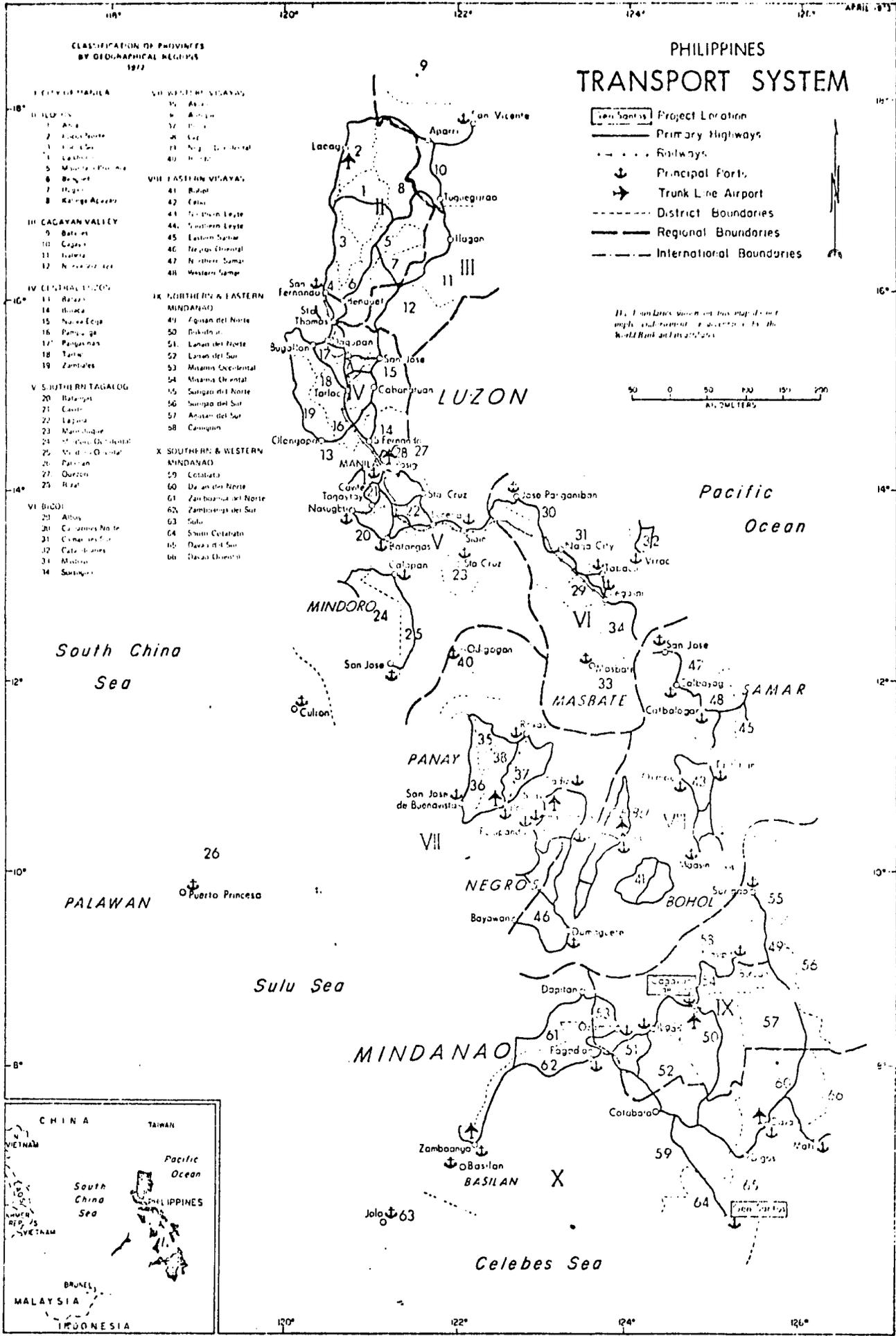
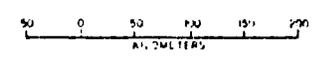
PHILIPPINES TRANSPORT SYSTEM

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

Legend:

- San Jose Project Location
- Primary Highways
- Railways
- ⚓ Principal Ports
- ✈ Trunk Line Airport
- - - District Boundaries
- District Boundaries
- - - International Boundaries

The San Jose shown on this map does not imply endorsement or assistance by the World Bank and its affiliates.



Mitigating factors have precluded implementing the project in certain areas. The Cagayan Valley and Southwestern Mindanao have been excluded for reasons of peace and order. Combined, these two areas include approximately 14 percent of the bottom 40 percent. To assure that benefits of road development reach rural poor farmers and not large landowners, the project will not be implemented in the large sugar plantation areas. This will exclude another approximately 6 percent of the rural poor, most of whom are landless agriculture laborers and not farmers (tenant or owner).

The criteria for road selection include a requirement that any road to be developed must have an average of ten farms of three hectares or less within its influence area per kilometer. This will encompass many of those who are included in the bottom 40 percent of the income scale.

As discussed throughout this paper, a key objective of this project is the institutional development objective of developing local government capability to implement programs on a sustained basis over the long-term period required to eventually reach the rural poor at large. Completion of the proposed programs in the selected provinces will provide the base for expanded activity in each of these provinces - by the provincial governments themselves and with a substantially improved opportunity for the rural population themselves to influence project selection. In the long term, such a focus on the institutional base is the only meaningful strategy for eventually reaching the target beneficiaries. In the same context - experience in the target provinces will provide a base from which these programs can be expanded to new provinces - thereby extending benefits to those areas currently excluded from this project.

C. Role of Women

Women in the Philippines are deeply involved in GOP development efforts and the rural roads program is no exception. Of the 22 provinces that will participate in this program, two have women governors and three have women Vice-Governors. Women hold elected positions as Provincial Board Members in many of the other participating provinces. Likewise, nearly every participating province has one or more women serving as elected Municipal Mayors.

About 10% of the engineers in the Provincial Engineer's Offices are women. In one province (Misamis Oriental), a woman is Chief of the Plans and Programs Division as is her chief assistant. In Pampanga, a female engineer is in charge of the quality control laboratory. It is anticipated that more women engineers will be employed by the participating provinces in order to meet the additional engineering work load that will be required to successfully implement the rural roads program.

Women also play a particularly important role in the provincial planning activities since they represent approximately 25% of the total employees assigned to the Provincial Development Staffs (PDS is the planning staff) of the 22 participating provinces. A woman holds the position as Chief Planner (Provincial Development Coordinator) in one of these provinces.

D. Engineering Analysis

1. General Description of the Project

The Project consists of the construction or improvement of rural road networks linking farms to market areas. The AID loan will support this rural road program which will be administered by the qualifying provinces through the direction of the DLGCD. The Program provides financing for many separate rural road links, each to be designated as a sub-project which satisfies the established technical and economic eligibility standards. Selection criteria have been adopted which will assure that each specific rural road sub-projects will be related directly to agricultural production or a related agro-industrial output or socio-economic benefit. The road systems of the Philippines are divided into three categories based upon maintenance responsibilities: 1) National Highways, 2) Provincial Roads and 3) Municipal Roads. It is the Provincial roads that are included in this project. The Municipality is a rural area subdivision of the Province and the Provincial-Municipal relation is similar to a county-township relationship in the U.S.

A majority of the sub-project roads will be farm to market roads serving agricultural land development areas with a limited number of secondary roads included for improvement in cases where they are necessary to obtain satisfactory road links between farm areas and marketing outlets. The work will include the construction of roads in new rural land development area and the reconstruction, reconditioning or improvement of existing roads. Drainage structures, culverts, bridges and ancillary structures will be included. The specific kilometerage of each category and grade of road to be constructed or improved is dependent up on final selection of the sub-projects. With ₱135,000,000 (\$20,000,000) of project funds available, it is estimated that approximately 750 kilometers of roads and 2400 linear meters of bridges will be constructed/improved under the Project.

2. Place of the AID Project within the Country Road Program

The importance placed by the GOP on transportation is reflected by the magnitude of activities currently underway with a number of donors.

Ongoing foreign-assisted major highway projects as of June 30, 1974 are the Pan-Philippine Highway (Phil) project with a programmed length of 1,480 kilometers; International Bank for Rehabilitation and Development (IBRD) Loan Projects,

2,700 Kms.; Asian Development Bank (ADB) assisted projects, 570 Kms.; and the Japanese Commodity Loan Projects, 280 Kms. for a total programmed length of 5,030 Kms at an estimated cost of 3 Billion Pesos of which 590,000,000 Pesos has been spent as of the end of Fiscal Year 1973-74.

Work on the roads, bridges and other structures of the Pan-Philippine Highway was 47.6 per cent completed as of June 30, 1974.

Under IBRD-assisted projects, work on the following project is in progress: Digos-Cotabato Road, Manila North Expressway, Manila North Road (Malinta-Rosario Section), Manila East Road (Taytay-Sta. Cruz-Calamba Road), Olongapo-San Fernando-Gapan Road. Sto. Tomas-Batangas Road, Las Pinas-Tagaytay Road, and the Tarlac-Lingayen Road.

Feasibility studies, of which 50 percent have been completed, are going on for the following projects under the third IBRD package: Tiwi-Tabaco-Legaspi Road, Bacolod-Villa Hermosa Road, Bacolod-Kabancalan Road, Negros-Cross Island Road, Iloilo-Roxas City Road, Cebu-San Remigio Road, Talisay-Toledo Road, Sayre-Highway (Bukidnon), Digos-General Santos Road and several feeder roads. The projects total 1,748 kilometers.

The ADB-assisted projects are the Cotabato-Gen. Santos Road, Iligan-Cagayan de Oro-Butuan City Road, Tarlac-Sta. Rosa Road, and the Polloc Port access road. Total programmed length: 565 Kms. including bridges.

The Japanese commodity loan road projects, total 280 kms. (including Bridges), include the Layac-Limay-Mariveles Road, Cavinti-Caliraya-Lumban Loo Road, Carmen-Dapecol-Mahay-Panabo Pier Road, Davao-Calinan-Bukidnon Road, Marikina - Infanta Road, Agoo-Tubao-Tuba-Baguio City Road and the Lamut-Banawe Road.

A majority of the above foreign financed road projects are arterial roads and nearly all are in the national highway system.

This proposed AID Project will not include any national roads and, therefore, there should be no duplication of efforts or overlapping with other foreign donors. This project will include only provincial and roads necessary to complete farm to market linkages.

3. Preliminary Technical Considerations

Based upon their individual Road Network Development Plans, the 14 Provinces to be included in the first year of Project implementation have a total road inventory of 18,510 kilometers of combined provincial and municipal roads. A copy of these plans are available for inspection with EA/CD. The total kilometerage within each province varies considerably from a high in the Province of Pangasinan of 3,068 kilometers to a low in the Province of Bataan of 251 kilometers. More than 85% of these roads are gravel or unsurfaced roads of which more than half are in poor to bad condition and will meet the basic criteria for sub-project areas of agricultural land which are accessible only by cart track or bridle path. During the long monsoon season, mid-June to mid-October, none of the unsurfaced roads can be considered suitable for vehicular traffic.

With such a vast number of possible sub-projects, it will be necessary to first rank-order the sub-projects for inclusion in the "Annual Implementation Plan" (AIP). Samples of AIPs are available for inspection with EA/CD. From this selected list, sub-projects which are estimated to cost more than ₱300,000 (\$45,000) will be subjected to a feasibility study. The limit of \$30,000 is a judgmental figure intended to represent a lower limit below which the cost of doing detailed economic studies becomes an increasingly large portion of sub-project cost and is not justified as a safeguard against inclusion of a few improvements falling below the pre-set economic guidelines. These smaller sub-projects may have an apparent very high B/C ratio; however, as a control, approval of all sub-projects not having an economic analysis will be justified by DLGCD as to reasonableness before inclusion into the construction program. An example of such a case would be where there is a road serving a large agricultural area which is in fair condition except for one short section, perhaps even only a box culvert, subject to periodic flooding during much of the rainy season. For this case, the influence area is large and would require considerable time and effort to fully develop the benefit data to justify a small expenditure for improvements. However, in all cases, sub-project selection criteria stated in Section I.A.3 shall apply.

4. Implementation Plan

The responsibility for the identification and selection of potential road projects rest solely with the Province. However, the Province must:

- a. Have prepared a Road Network Development Plan (RNDP) listing projects in priority order required to develop the road network of the province to meet transportation needs.
- b. Annually list potential sub-projects in a Five-Year Capital Improvement Program (CIP) that indicates the development needs of the Province over the immediate five year period.
- c. Submit an Annual Implementation Program (AIP) consisting of the first year requirements of the CIP to DLGCD and to the NEDA Regional Development Council (RDC), respectively, for their approval.
- d. Appropriate in the annual action budget necessary funds required to implement the AIP as approved by DLGCD.
- e. Prepare detailed road and bridge plans, specifications and cost estimates for the sub-projects.
- f. Submit plans, specifications, cost estimates and if the preliminary estimate indicates a sub-project cost greater than ₱200,000 (\$30,000), an economic study will be prepared in accordance with methodology given in Section II.C.
- g. Construct the roads and bridges according to plans and specifications as approved by DLGCD and concurred in by USAID.
- h. DLGCD will:
 - (1) Reserve funds needed for reimbursement to the Provinces.
 - (2) Employ an A&E firm to review and monitor provinces work on sub-projects and certify completion according to plans and specifications.
 - (3) Reimburse Province for satisfactorily completed work according to agreed upon amount as based on previously approved cost estimates.
 - (4) Establish and maintain a complete set of files and records in accordance with the provisions of administrative procedure.

(5) Upon request in writing provide USAID all documentation specified in Paragraphs a through g for their review and approval prior to commencement of construction work by the Province.

5. Design Standards

The "Highway Construction Guidelines for Provincial Engineering Offices" has been prepared by PDAP and adopted recently by the Provincial Engineers Association of the Philippines as a first step in standardizing design and construction of highway work in all 72 provinces of the Philippines. A copy of this document is with EA/CD for inspection. It is anticipated that all eligible PDAP provinces will have officially adopted these guidelines before implementation of this Project. This will not only standardize the design features of roads and bridges but also the preparation of plans and estimates for projects.

Virtually all of the roads constructed/improved under this Project will fall within the design categories for annual average daily traffic count (ADT) below 400. Design standards for these categories are given in Table IV below.

All materials used in construction and methods of construction will meet the Standard Specifications for Highways and Bridges of the Department of Public Highways. These standard specifications were adopted from and are similar in detail and quality to those of the U.S. Bureau of Public Roads. All roads proposed for inclusion in the Project will be subjected to an appraisal of technical soundness and for those sub-projects with a preliminary cost estimate greater than \$30,000 an economic analysis as illustrated in Annex XI of this CAP will be prepared. It is anticipated that most of the road sections will be gravel surfacing based on a 10-year projected sub-project life. Where a more permanent surfacing of asphaltic or portland cement concrete is indicated, the economic analysis will utilize a 20-year project life.

As a general rule, all roads will consist of two lanes having a total pavement width of 5 to 6 meters with 1 to 1-½ meter shoulders widths. The roadways will consist of common borrow, selected borrow sub-based course, and aggregate base course designed and compacted to support a 10 ton axle load. For roads below 100 ADT the aggregate base course will serve

as the surface of Double Bituminous Surface Treatment or Macadam will be added when justified. It is anticipated that in a few cases an asphaltic or Portland Cement Concrete surface course may be justified because of higher traffic density, environmental or other technical needs.

Drainage will be provided by means of side ditches together with reinforced concrete pipe culverts, box culverts or bridges as required to accommodate cross drainage. Although specific site conditions may dictate some variation, generally where spans are more than 6 meters in length, reinforced concrete deck girder (RCDG) bridges will be used for spans up to 18 meters in length. Spans of less than 6 meters will generally be accommodated with the use of box or pipe culverts. Normally, bridges will be designed for H-15 loading and will have a clear roadway width of not less than 6.7 meters; however, design for H-20 loading criteria may be justified in specific areas where abnormally heavy truck traffic is prevalent or projected.

MINIMUM DESIGN STANDARDS								
	ANNUAL AVERAGE DAILY TRAFFIC VOLUME							
	BELOW 100		100 to 400		401 to 1000		1000 to 2000	
	Minimum	Desirable	Minimum	Desirable	Minimum	Desirable	Minimum	Desirable
(x) DESIGN SPEED (KPH)								
FLAT TOPOGRAPHY	50	60	60	70	70	80	70	90
ROLLING TOPOGRAPHY	40	50	50	60	60	60	60	70
MOUNTAINOUS "	30	40	40	50	40	50	60	60
MINIMUM RADIUS (M)								
FLAT TOPOGRAPHY	80	120	120	170	170	220	170	290
ROLLING TOPOGRAPHY	50	80	80	120	120	170	120	170
MOUNTAINOUS "	50	50	50	80	50	120	80	120
MAXIMUM GRADIENT (%)								
FLAT TOPOGRAPHY	4	3	3	3	3	3	3	3
ROLLING TOPOGRAPHY	6	5	5	5	5	5	5	5
MOUNTAINOUS "	6	6	6	6	6	6	6	6
NON-PASSING SIGHT DIST. (M)								
FLAT TOPOGRAPHY	60	80	80	90	90	110	90	130
ROLLING TOPOGRAPHY	50	60	60	80	80	90	80	90
MOUNTAINOUS "	40	50	50	60	50	80	60	80
SUPERELEVATION	MAX E - 0.10 M/M. WIDTH OF ROADWAY: $E = .004V^2/R$							
WIDTH OF PAVEMENT (M)	5.0	6.0	6.0	6.1	6.1	6.7	6.7	6.7
WIDTH OF SHOULDERS (M)	1.0	1.5	1.5	1.5	2.5	3.0	3.0	3.0
WIDTH OF ROADBED (M)	7.0	8.5	8.5	9.1	11.1	11.1	12.7	12.7
TYPE OF SURFACING	GRAVEL		BITUMINOUS SURFACE TREATMENT		PORTLAND CEMENT OR BIT. CONCRETE		PORTLAND CEMENT OR BIT. CONCRETE	
WIDTH OF RIGHT-OF-WAY (M)								
RURAL	15	15	15	20	30	60	60	60
NEW BRIDGES								
CLEAR WIDTH (M)	6.1	6.1	6.1	7.2	9.1	11.1	12.7	12.7
DESIGN ROAD	H-15	H-15	H-15	H-20	H-20	H-20	H-20	H-20
VERTICAL CLEARANCE (M)	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.5

6. Equipment

The 14 participating PDAP provinces will start the project with a combined total equipment inventory of 1,352 pieces, most of which were acquired through the USG Excess Property Program. The original acquisition cost of this equipment is more than \$13 million. The IEOs have demonstrated, during the past two years, that this equipment level, when combined with labor intensive construction methods, is sufficient to achieve the construction production rate required for successful completion of the Project. It is recognized that additional equipment inputs will enhance the Provincial construction capabilities and that it also will be necessary to periodically replace worn out equipment. Funding for additional and replacement equipment is planned for by the Province in its CIP.

For current provincial equipment inventories see Annex V.

For planned provincial equipment acquisition see Annex VI.

7. Maintenance Capability and Funding

The Provincial Engineer's Office (PEO) is responsible for the care and maintenance of all designated provincial roads. The capabilities of the PEOs in program management, construction and maintenance had been greatly enhanced since 1968 under the PDAP/USAID program of excess property allocations and training programs in operation and maintenance of equipment and in all phases of engineering management, project selection, design, cost estimation, contract administration and force account construction. The PDAP/USAID program will continue to support and upgrade the PEOs with training programs in engineering management, equipment pool management and with additional equipment to be made available under the USG excess property program. PEO road and bridge maintenance capabilities are considered adequate and are expected to improve during the life of the Project.

Prior to the Decentralization Act of 1967 (R.A. 5185) the care and maintenance of all roads and highways in the Philippines was under the exclusive jurisdiction of the Department of Public Highways (DPH). The act provided for creation of the PEOs and made the province responsible for care and maintenance of local (provincial) roads while DPH retained jurisdiction over the national highway system.

The basic project implementation agreement between DLGCD and each implementing province will contain a provision which requires that any road segment included in any sub-project under this Project shall be incorporated into the provincial road system and that the province covenants to take all action necessary to provide funds for, and insure, the adequate maintenance of said road segment.

In the past the provinces had some difficulties in finding sufficient funds to adequately maintain their roads. This problem may have been solved when Republic Act 917 was amended by Presidential Decrees No. 17, 130 and 320 to specifically provide for an average basic cost per kilometer for National Highways and further states that the Provinces shall receive an amount equal to fifty percent (50%) of the current basic national cost per kilometer for each kilometer of provincial road recommended by the Provincial Governor and accepted by the Commissioner of Public Highways to be part of the Provincial system.

The Act also states that in order to qualify for the national aid for maintenance the Provinces shall be required to submit an annual maintenance program for the entire network of roads under their jurisdiction for approval by the Commissioner of Public Highways and to provide a certification that counterpart road and bridge maintenance funds have been appropriated by the Province in the amount of one-half of the National aid (i.e., 25% of the average basic per kilometer unit maintenance cost for national highways).

The current basic unit cost for maintenance of National Highways used as the basis for computing national aid is ₱4,500.00 per kilometer. Kamsax-Berger, the present general consultant of the DPH, under IBRD financing, has recommended an increase in the basic cost for maintenance to ₱6,500.00 per kilometer of which has been approved by the DPH but is still pending with the Commission on Audit, COP.

Maintenance Practices

Each PEO maintenance division is headed by a senior engineer who is assisted by junior engineers, foremen, and employs work gangs led by capataz (sub-foreman) for each category of maintenance work (such as asphalt patching, bridge repair, drainage repair, etc.). These work gangs are supported by equipment from the Equipment Pool. The basic equipment normally assigned to the Maintenance

Division consist of: 1-jeep for inspection, 2-service trucks to transport men, materials, hand tools; and such other maintenance equipment as dump trucks, roadgraders, cranes, etc., which are assigned as needed depending on the work items to be performed and the work schedule.

The labor requirement for maintenance normally runs to about 50-70% of the total maintenance cost with a maintenance gang of eight unskilled laborers generally being used for every road section of not more than 20 kilometers length. In addition to this, skilled workers such as masons and carpenters are moved from sub-project to sub-project as their skills are needed.

The PEOs have sufficient personnel and equipment to meet the requirement of normal activities in both maintenance and construction. Where a program such as the Flood Rehabilitation Program calls for a heavier work load, the use of private contractors or suppliers have proved very successful in accelerating production without the need for acquiring additional equipment which may lie idle during periods of normal operation. Private contractors have also been used effectively and economically to provide equipment inputs not available in the Provincial Equipment Inventory or to meet deadlines including the threat of monsoon seasons, etc.

For road sections near the Equipment Pool and/or PEO Compound, equipment and personnel are assigned on a daily basis. However, for areas beyond 30 kilometers from the PEO Compound, equipment and personnel are generally assigned on permanent basis with personnel being given incentives in the form of field allowances. Supervision is accomplished by periodic inspection (scheduled and unscheduled) on the progress of the work. In cases where unskilled labor can do the work, casual laborers are hired at the job-site in order to economize on cost of transportation and other incidental expenses, and to provide emolument and employment opportunities for local labor forces.

Maintenance normally has priority over new construction in the assignment of equipment, especially during the period before, during and immediately after the monsoon season. The priority is altered during the dry season when construction activity is at its peak.

8. Appraisal of Technical Soundness

a. Labor

Unskilled labor is available locally in abundant numbers in each of the participating provinces. The provincial governments use labor intensive construction methods as a means of alleviating unemployment in the rural areas and combines such methods with available equipment to maintain reasonable costs and work rates.

The availability of Philippine skilled labor such as equipment operators, mechanics, steel workers, welders, etc. and technical personnel such as surveyors and project engineers remains a countrywide problem since they are coveted by international engineering and construction organizations for work assignments throughout South and Southeast Asia. To the present time the PEOs have been able to maintain an adequate work force, but the Project will have to compete with accelerated construction in other fields with regard to wages and working conditions to maintain their favorable manpower position. Continuing to provide training courses in equipment operation and maintenance will assist in maintaining an adequate supply of such personnel.

b. Equipment

Paragraph 6 of this engineering analysis discusses the construction equipment available in the PEOs. This will be supplemented by local contractor-owned equipment for some contract work. Also equipment is available from the Department of Public Highways through an equipment rental agreement. USAID will continue to assist in obtaining as much usable equipment as can be made available from the USG excess property program.

c. Design

Standards for design and construction of the roads have been agreed to by GOP (both national and provincial agencies) and USAID. Adequate technical input will be available within the Provincial engineering staff in developing sub-projects surveys, land acquisition documentation, preparation of plans, specifications, cost estimates and bid documents and supervision of construction for both force account and contract construction work. The PEOs are presently engaged in a greatly expanded program of construction under the Flood Rehabilitation and the Special Infrastructure Programs. During the prosecution of these programs they have built-up both technical and non-technical work forces considered capable of immediately implementing this proposed project

without any loss time for management or technical training.

The DLGCD will utilize an existing PDAP trained staff of ten engineers to assist and monitor the work of the PEOs in all phases of sub-project preparation. The DLGCD also will contract with a local A & E firm to provide independent monitoring and field inspection services as well as certifying sub-project completion for the Project. This is similar to the services provided by OICC/Parsons for USAID during the execution of the Flood Rehabilitation Program.

d. Materials

No special materials problems are expected to arise during execution of the Project. Aggregate materials are abundantly available in all provinces and each Province has submitted an Aggregate Plan which is available with EA/CD for inspection. Because of accelerated consumption during the Flood Rehabilitation Program and the inflationary world price following the "oil price squeeze" cement, reinforcing steel and asphalt prices escalated and some items became scarce; however, the local production capacity has returned to normal.

e. Access and Right-of-Way

Since the Project consists primarily of improving existing roads and cart trails, sufficient access for construction should be available. This assumption is based upon experience gained during the Flood Rehabilitation and SIP Programs where right of way acquisition in rural areas did not present a problem.

f. Bridges

The PDAP Provinces have adopted the Department of Public Highways standard bridge superstructure designs utilizing reinforced concrete deck girders for span lengths up to 18 meters and prestressed concrete girders of AASHO design for longer spans. Concrete bridges constructed under this program generally will be for standard modular span lengths of six meters and no major structures are foreseen. The DPH also has agreed that engineers and structural draftsmen from its regional office bridge design divisions can be made available on a loan basis to the PEOs to assist in sub-structure investigation, bridge design and preparation of detailed plans and specifications. These services would be

made on an arrangement where the province would reimburse the DPH for the costs of salaries and other related expenses. This arrangement was used satisfactorily for eleven bridge projects in the Flood Rehabilitation Program.

g. Weather Effects on Construction

The general rainfall pattern of the Philippines varies from light to moderate during the six to seven months of dry season and from moderate to heavy during a five month monsoon season. One to two week periods of continuous rain are not uncommon during the monsoon season interspersed with periods of one to three weeks characterized by afternoon and evening thunderstorms. Roadway construction becomes increasingly difficult and more costly during the wet season. The most economical work pattern, as developed recently on other AID sponsored programs is to concentrate on construction during the dry season and to undertake technical engineering design and management details during the wet season as well as to use this period for repair and maintenance of equipment preparatory to the field work during the following dry season.

9. Cost Estimates

Firm estimates of costs for each sub-project will be based on surveys and engineering design of the individual roads following an appraisal of technical soundness and an economic analysis. These estimates will be prepared by the PEOs and transmitted to DLGCD where they will be reviewed by the independent A & E as outlined in Administrative Procedures. USAID reserves the right to review and approve any sub-project estimated over \$100,000 prior to notice to commence work.

While the quantity of the various items of construction included in each project will vary with terrain and with the degree of improvement required, the unit costs of these items are relatively constant. Average unit costs were developed by the concerted effort of all PEO engineers specifically for this Project. These unit costs were prepared from actual costs obtained from provincial records of recent force account and contract work. These costs have been reviewed by PDAP/USAID engineering staffs. These cost listings will serve as data for computation of sub-project costs during the sub-project economic evaluation process and as comparative data for DLGCD engineers during review of detailed plans and estimates as submitted by the Province.

Table V gives a list of all unit costs which will be used at the start of this project. Table VI gives an example of the analysis used in developing the unit costs of Table V. The unit costs will be revised whenever DLGCD/USAID mutually agree that actual costs have changes a significant amount to justify establishing new unit costs.

10. Labor Utilization

The use of manual labor in road and bridge construction is not new in the Philippines. Some of the roads considered for improvement under this program were originally constructed with the exclusive use of manual labor. In the more recent past the tendency in the Philippines has been to move toward the use of modern mechanized construction methods; however, the recent world fuel crisis and the rising cost of operating and maintaining equipment has resulted in a new Provincial policy encouraging labor-intensive programs in construction and industry to alleviate the unemployment in the rural Areas.

Abundant examples of using intensive labor to supplement mechanization are found in the projects performed under the Flood Rehabilitation and Special Infrastructure Programs. Some examples are:

a. More than half of all the Select Borrow Base Course, Aggregate Base Course and Aggregates for concrete and asphalt mixes for the programs, were loaded and unloaded using flatbed trucks by pick and shovel labor. This resulted in an average labor force of from 3000-4000 man-days per kilometer of aggregate base course surfaced roadway.

b. Aggregates normally must be screened and washed in order to meet plans and specifications. In most cases, screening and washing of aggregate are done solely by manual labor resulting in a value added for manual labor of 15-25% of the cost of the material.

c. Asphalt macadam surfacing is constructed by spreading aggregate courses and applying asphalt by hand labor. This results in an addition average of 1000-1200 man-days of labor per kilometer when this type of surfacing is used.

d. Portland Cement Concrete Pavement is constructed by 25 to 35 men labor groups feeding aggregates into a two or three-bag concrete mixer, then spreading and finishing the

STANDARD UNIT COST

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>UNIT</u>	<u>ECONOMIC COST</u> (Total Cost Less Taxes)	<u>FINANCING COST</u> (Total - Contract Cost)	<u>REIMBURSABLE COST</u> (Direct Cost)
	Preliminary Engineering				
Special	Road	Km.	P 744.00	P 800.00	P -
Special	Bridge	M.	186.00	200.00	-
100	Clearing and Grubbing	Ha.	2,752.00	3,200.00	1,200.00
102	Stripping	Sq.M.	1.10	1.20	0.60
103	Removal of Bridge Culverts and Siphons	Each	-	-	-
105	Roadway & Drainage Excavation	Cu.M.	5.22	5.80	4.32
106	Excavation for Structures				
	106-1 Under Water	Cu.M.	35.72	38.00	31.54
	106-2 Above Water	Cu.M.	23.00	25.00	20.75
107	Borrow	Cu.M.	7.20	8.00	5.36
108	Aggregate Subbase	Cu.M.	23.00	25.00	21.25
110	Foundation Fill	Cu.M.	13.80	15.00	13.45
117	Protection Ditches	Lin.M.	11.64	12.00	10.92
118	Preparation of Previously Constructed Roads	Km.	4,128.00	4,800.00	3,456.00
200	Aggregate Base Course	Cu.M.	25.50	30.00	22.80
302	Bituminous Prime Cost (Emulsified)	M.T.	984.00	1,200.00	876.00
303	Bituminous Tack Cost (Emulsified)	M.T.	984.00	1,200.00	876.00
304	Bituminous Surface Treatment Aggregate	Cu.M.	23.00	25.00	21.25
	Asphalt	M.T.	1,476.00	1,600.00	1,168.00
305	Bituminous Seal Cost Cover Materials	Cu.M.	25.76	28.00	23.80
	Asphalt	M.T.	1,476.00	1,600.00	1,168.00
308	Dense Graded Plant-Mix Surface Course (Emulsified Asphalt Type)	Sq.M.	77.90	95.00	82.65
310	Bituminous Concrete Surface Course	M.T.	104.40	120.00	104.40

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>UNIT</u>	<u>ECONOMIC COST</u> (Total Cost Less Taxes)	<u>FINANCING COST</u> (Total - Contract Cost)	<u>REIMBURSABLE COST</u> (Direct Cost)
312	Dense Graded Travel Plant-Mix Surface Course	Cu.M.	P -	P -	P -
316-1	Portland Cement Concrete Pavement (0.15M)	Sq.M.	36.12	42.00	30.66
	Portland Cement Concrete Pavement (0.20M)	Sq.M.	47.30	55.00	40.15
401	Timber Detour Spans	Lin.M.	7,440.00	8,000.00	6,800.00
402	Piling	Lin.M.	213.60	240.00	180.00
403	Concrete Railing	Lin.M.	136.00	160.00	115.20
405	Concrete Class "A"	Cu.M.	408.00	480.00	412.80
405 A	Pre-Stressed Concrete Structures	Each	-	-	-
406	Reinforcing Steel	Kilo	4.68	5.20	4.42
407	Structural Steel	Kilo	10.80	12.00	10.92
409	Sheet Piles	Lin.M.	-	-	-
410	Treated and Untreated Timber	Lin.M.	-	-	-
412	Stone Masonry	Cu.M.	57.00	60.00	45.00
413	Reinforced Concrete Culvert Pipe				
	413-1 18" RCP	Lin.M.	85.50	90.00	70.20
	413-2 24" RCP	Lin.M.	123.50	130.00	97.50
	413-3 30" RCP	Lin.M.	161.50	170.00	136.00
	413-4 36" RCP	Lin.M.	218.50	230.00	190.90
	413-5 42" RCP	Lin.M.	332.50	350.00	297.50
500	Grouted Riprap	Cu.M.	85.50	90.00	76.50
501	Hand Laid Rock Embankment	Sq.M.	76.80	80.00	68.00
514	Shouldering	Sq.M.	-	-	-

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TABLE VA

ITEM 108 - AGGREGATE SUBBASE

VOLUME = 1,650 Cu. M.

I. MATERIALS:

1,650 Cu. M. x 17 = P28,050.00

II. RENTAL OF EQUIPMENT:	Reimbursable	Non-Reimbursable
1 - Rd. Grader @ P250/day for 4 days		P1,000.00
1 - Pneu. Roller @ P108/day for 9 days		972.00
1 - Rd. Roller @ P245/day for 9 days		2,205.00
1 - Water Truck @ P170/day for 9 days		1,530.00
1 - Water Pump @ P20/day for 9 days		180.00
1 - Service Vehicle @ P30/day for 9 days		270.00
		<u>P6,157.00</u>

III. P.O.L.:

1 - Rd. Grader @ P69.626/day for 4 days	P 278.00
1 - Rd. Roller @ P65.414/day for 9 days	588.00
1 - Pneu. Roller @ P58.96/day for 9 days	531.00
1 - Water Truck @ P64.34/day for 9 days	580.00
1 - Water Pump @ P6.41/day for 9 days	57.00
1 - Service Vehicle @ P30.348/day for 9 days	
	<u>273.00</u>
	<u>P2,307.00</u>

IV. LABOR:

1 - Proj. Engr. @ P14.50/day for 9 days	P 131.00
1 - Const. Foreman @ P13.00/day for 9 days	117.00
1 - Rd. Grader Optr. @ P13.00/day for 4 days	52.00
1 - Rd. Roller Optr. @ P13.00/day for 9 days	117.00
1 - Pneu. Roller Optr. @ P13/day for 9 days	117.00
2 - Driver @ P12.00/day for 9 days	216.00
2 - Lab. Tech. @ P12.00/day for 9 days	216.00
1 - Water Pump Optr. @ P12.00/day for 9 days	108.00
25 - Laborers @ P8.00/day for 9 days	1,800.00
1 - Instrumentman @ P10.00/day for 9 days	90.00
4 - Helpers @ P8.00/day for 9 days	288.00
1 - Rodman @ P9.00/day for 9 days	81.00
3 - Night Watchman @ P8.00/day for 9 days	<u>216.00</u>
	<u>P3,549.00</u>

V. GEN. SUPERVISION:	Reimbursable	Non-Reimbursable
1 - Const. Supervisor @ P23/day for 9 days		P 207.00
1 - Q.C. Supervisor @ P23/day for 9 days		<u>207.00</u>
		P 414.00
VI. MISCELLANEOUS:		
Per Diem	P 538.00	P 45.00
Reserve for Leave	<u>460.00</u>	-
	P 998.00	<u>P 45.00</u>

S U M M A R Y

	<u>Reimbursable</u>	<u>Non-Reimbursable</u>
I. MATERIALS	P28,050.00	P -
II. RENTAL OF EQUIPMENT	-	6,157.00
III. P.O.L.	2,307.00	-
IV. LABOR	3,549.00	
V. GEN. SUPERVISION	-	414.00
VI. MISCELLANEOUS	<u>998.00</u>	<u>45.00</u>
	P34,904.00	P6,616.00
TOTAL ESTIMATED REIMBURSABLE COST - - - - -		
		P34,904.00
ESTIMATED UNIT COST (REIMBURSABLE) - - - - -		
		P21.154
	Say - - - - -	P21.25
TOTAL ESTIMATED FINANCING COST - - - - -		
		P41,520.00
ESTIMATED UNIT COST (FINANCING) - - - - -		
		P25.16
	Say - - - - -	P25.00

concrete mix by hands. With a production capacity of about 50 linear meters of one traffic lane (3.05 meters width) per day for a two-bag mixer, this amounts to a labor requirement of 1200 to 1500 man-days per kilometer in addition to the 3000 man-days required for placement of aggregate base course. These same labor-intensive methods are employed for placement of concrete in bridge and culverts.

e. Timber trestle bridges will be used in about 25 percent of the cases for this project. All the work, except pile driving, is done by manual labor and represents about 30-35% of the total cost of the structures.

The above shows a high utilization of common labor expected to be used in these proposed road projects. In summary, the labor component per kilometer is as follows:

Gravel roads - 3000 to 4000 man-days

Asphalt surface treatment or asphalt macadam - 4000 to 5200 man-days.

PC concrete surface - 4200 to 5500 man-days.

The GOP has established a minimum wage rate of ₱8.00 per day. Converted at this rate the above labor cost component amounts to:

Gravel Roads - ₱24,000 to 32,000 per KM.

Asphalt Roads = ₱32,000 to 42,000 per KM.

Concrete Roads - ₱34,000 to 44,000 per KM.

The above does not consider the value added for labor for quarrying of materials and construction of minor structures.

These labor costs represent approximately 40% of gravel road costs and approximately 20% for hard surfaced roads. In addition, approximately 20% of the Province sharing cost of ₱35,000,000 will go to service costs, mainly in the form of wages to professional and management staff labor. By conservative estimate, this means that ₱36,000,000 of the total Project cost will be paid to the Provincial labor sector, of which approximately ₱29,000,000 will be wages to the common labor forces and ₱7,000,000 in salaries to professional and management staff labor.

11. Environmental Aspects

a. Background

The GOP recognizes that "the danger of air and water pollution is becoming a serious health problem, particularly in areas of high concentration of motor vehicles and industrial facilities". In 1964, Republic Act 3931, known as the Pollution Control Law, was enacted creating the National Water and Air Pollution Control Commission (NWAPCC), an Agency to control, abate and prevent the pollution of the Philippine environment. This agency spearheads the GOP program on anti-pollution.

The NWAPCC has established standards and promulgated rules and regulations requiring heavy pollution offenders to adopt appropriate controls. The Agency has investigated complaints of air and water pollution in all areas of the Philippines and has embarked on a research program which presently involves five major research projects: two on air contaminant levels, two on water pollution effects on fish and one on classification of rivers and estuaries.

b. Project Environmental Impact

The basic goal of the Project is to facilitate increased agricultural production through the provision of adequate transport facilities between farm areas and market outlets. This supports the GOP goal of developing farm production to meet the needs of the populace. Therefore it can be stated that the environmental impact of the Project upon the country will be beneficial to the degree that the basic goal is reached.

The local community in the immediate vicinity of the road can be expected to realize a somewhat more intense version of the benefits of increased availability of farm products and in addition will be subjected to environmental consequences, both beneficial and detrimental which may be directly attributed to the Project. Such consequences will include short term effects during construction such as dust, inconveniences of traffic delays and employment of local labor, and long term effects such as increased agricultural outputs, increased fertilizer pollution of surface water, increased vehicular traffic air pollution and better access to health, school, recreational and other public facilities. Efforts will be made to minimize detrimental effects and, where possible to enhance those considered to be beneficial.

(1) Conservation and Preservation

Water and air pollution in the form of soil erosion and dust are inherent in construction projects involving large areas of bared earth and applications of earth embankment or aggregates. Erosion will be minimized by keeping work areas graded to facilitate controlled drainage. Dust will be minimized by watering of haul roads, work areas and in borrow areas when necessary to assure optimum moisture content of the materials during handling. The design of roadway drainage facilities, side ditches and cross drainage, will seek to facilitate the flow of surface water in the naturally established patterns and thus minimize long term effects of erosion. Air pollution by dust generated by traffic is a long term effect which is inherent in gravel-surfaced road use. With traffic volumes of less than 100 ADT the dust generated should not be harmful to crops. The Philippine cultural traits of rural families grouping their homes together in small settlements rather than scattered on their individual farm enhances the ability of minimizing dust related effects on humans. Where traffic is more than 50 ADT short stretches of road through such settlements will be given a bituminous surface treatment for purposes of dust control. Vehicle exhaust emissions of traffic even in the low volumes expected to use these farm to market roads are a factor to be considered; however, scant attention need be given this problem since low traffic volume and wide dispersion areas make this aspect negligible.

The roads will normally follow the contour of the land utilizing side borrow with no massive excavation or embankment areas anticipated. Where fill sections are needed, sub-base material normally will be hauled in since the roads go through valuable rice land and it is cheaper to haul in material than to destroy productive agricultural area.

(2) Social benefits to the farm communities from improved access to market centers are of significant importance and include, in addition to the heightened affluency resulting from increased agricultural production, easier access to facilities normally clustered around market centers such as health facilities, family planning centers, schools, recreational facilities, parks and other public facilities and a chance to participate in local government activities.

The roads will be constructed/improved along established road rights-of-way or cart tracks; however, it will be necessary to acquire wider rights-of-way in many cases and some realignment will be necessary. This will result in some loss of farm land and may result in the relocation of some houses. Displacement of farms in-toto is not anticipated and that of farm housing will be kept to a minimum because of higher costs associated with relocation.

(3) The Philippines has some incidents of schistosomiasis and malaria, both are water born diseases. The goals of the Project include increasing agricultural production through lower transport costs in presently farmed areas and in some cases opening new areas to farming. In many cases, this will mean the introduction of or increased irrigation and fertilization. Increased use of irrigation water may add to the possibility of the spread of snail and mosquito vectors; however, the accessibility to control agencies and health facilities is expected to more than offset this possibility and effectively produce a more healthy environment.

c. Alternatives to Project

With respect to environmental aspects, the only alternatives to the project are variations in the size of the Project, including that of no Project at all. The alternative of doing nothing with respect to this project would theoretically cancel all environmental aspects, both beneficial and detrimental; however, given the high priority placed on increasing agriculture production by the GOP, and the worldwide emphasis for increased food production it is more likely that the road construction represented by this project would be accomplished but over a greatly extended time frame. Estimate by Provincial Engineers vary from 15 to 25 years for completion of similar work quantities at normal budget allocations. The Project more nearly represents an acceleration in the realization of project aspects and it is obvious that this project will have a positive overall impact. Since the Project is made up of many sub-projects, which are relatively independent of other sub-projects, a variation of the size of the overall Project would result only in a proportionate variation in the number of sub-projects with little or no change in environmental impact of those sub-projects completed. Thus the overall impact of decreasing the Project size would be a decrease in positive impact.

E. Economic Analysis

1. Introduction

The provinces expected to participate in this project have prepared or are required to prepare individual Road Network Development Plans which identify specific road segments on sub-projects. Each province will subject these sub-projects to a two-stage screening process to determine their economic feasibility. The preliminary screening of sub-projects will be made in accordance with the initial selection criteria listed above in Section I.A.3. Only those sub-projects which comply with the initial selection criteria will be subjected to individual economic analyses in accordance with the general methodology set forth in Annexes XI and XII. The sub-projects which meet the minimum economic and technical criteria shall be considered eligible for financing under this project.

USAID and PDAP have agreed, in principle, on the economic criteria (including a consideration of social and socio-economic benefits) to be used in evaluating sub-projects. Three methodologies were considered which are listed below in descending order of simplicity of application.

$\frac{PV^1}{K_0}$ or the First Year Benefit/Cost Method

Benefit/Cost Ratio (B/C) Method

Internal Rate of Return (IRR) Method

In general, the screening process should limit analyses to minor feeder roads and penetration roads (see below for definition) for improvement or construction to gravel standards or possibly major feeder roads to higher standards.

A simplified IRR Method over a 10 year evaluation period has been selected as the most appropriate for determining the economic feasibility of improving or constructing rural roads to gravel standards. For a few projects where a more permanent surfacing of asphaltic or portland cement concrete is indicated, the economic analysis will utilize a 20-year project life. The first year B/C method is inappropriate when future development benefits are the one main reason for road improvement. The B/C method may lead to ratios which cannot be effectively compared. As the Provincial Development Staffs (PDS) analyze more projects using the IRR method, the simpler B/C method should be tested to determine if it gives significantly different results in evaluating rural road projects. If the results are not significantly different then the B/C method could be used. A 15 percent discount rate is

considered as an approximate measure of the opportunity cost of capital in the Philippine economy. In terms of the internal rate of return criterion, sub-projects should have an IRR of 15 percent or greater to be deemed economically feasible.

2. Economic Evaluation

The underlying concept for evaluation is the "with or without" criterion. The analyses shall seek to measure the benefits relative to costs without road improvement or construction and with road improvement or construction. Improved rural roads will reduce transportation costs. Stimulate marketable agricultural production and facilitate commercial activity for rural areas particularly in the movement of agricultural inputs to the producing areas and the movement of agricultural surpluses to markets and processing (agro-industrial) facilities. Small farmer communities may also be linked by all weather access to medical, educational, agricultural, extension and other services and ideas thus contributing to the enrichment of rural life.

For minor feeder and penetration roads the stimulation of marketable agricultural surpluses would substantially increase small farmer income. Crops produced for consumption by a farmer's family will not be materially affected by road improvement. This analysis therefore concentrates on crops produced for sale outside of the immediate producing area.

Rural roads can be functionally divided into three categories based upon their service to agriculture, the area served, traffic levels, road condition and the anticipated benefits from road improvement. These are major and minor feeder roads and penetration roads.

a) Major Feeder Roads

Major feeder roads serve as a main access route to agricultural areas connecting poblacions and produce collection centers to the primary road network. Current traffic levels are high on major feeder roads and they are usually open to traffic throughout the year. Although operating costs are high because of low construction and maintenance standards, these roads do not significantly hinder the transport of agricultural inputs or of commodities to market. The major result of improvement will be the lowering of transportation costs (reduced vehicle operating costs). Present users of the road and those who would normally be using the road in the future will incur lower costs for operating their vehicles. The present value of the algebraic sum of annual vehicle operating cost savings and road maintenance cost differences are compared with the present value of construction costs to determine the probable return on investment.

b) Minor Feeder Roads

Minor feeder roads serve smaller producing areas and cooperatives. They are in general closed part of the year or are very difficult to negotiate in the rainy season. Traffic levels are moderate to low. These roads are a first link in the farm to market transport system connecting agricultural producing areas to nearby populations and produce collection and storage centers and/or the major feeder road networks. Increased agricultural production is a basic reason for road improvement and should result from extended road use in the rainy season, thus allowing more production to reach markets and inputs to reach the producing areas. Forecasts of induced production over the analysis period, net of other economic costs is the basis for estimating benefits of road improvement. Vehicle operating costs savings are small in scarcely populated areas because of low traffic levels but can be a significant factor for some minor feeder roads when present traffic is higher. The present value of the algebraic sum of the net income to small farmers from agricultural production generated by road improvement, vehicle operating cost savings and annual road maintenance cost differences are compared with the present value of construction costs to determine the probable return on investment.

c) Penetration Roads

Penetration roads usually involve new construction or improvement of low standard roads or tracks. Penetration roads can open up entirely new areas of settlement or serve areas where cash crop production is very small due to lack of transport facilities. Dry weather access is difficult and in some cases impossible due to the lack of bridges over perennial streams. Traffic levels are very low to non-existent. There is a high uncertainty as to the rate and type of development which could be expected from the establishment or improvement of penetration roads. Stimulated agricultural is the main benefit to be derived from penetration roads. The present value of the algebraic sum of the net income to small farmers from agricultural production generated by road improvement and annual road maintenance cost differences are compared with the present value of construction costs to determine the probable return on investment. Penetration roads may also be evaluated as part of a sub-project scheme. Here a package approach can be used. See Annex XI for a more thorough treatment.

USAID and PDAP have also agreed that the Provincial Development Staff (PDS) of each participating province will bear responsibility for undertaking the required economic analysis. The present capability of the PDS to accomplish the required analytical tasks varies from province to province. All the PDS's given adequate training and experience are capable of acquiring the necessary skills for project evaluation. Additionally, PDAP will conduct a training program for PDS staff to familiarize them with the methodology discussed below. A sufficient data base exists to warrant an economic analysis according to the guidelines described here and in annexes XI and XII.

F. Financial Plan

1. Summary Cost Estimate and Financial Plan
(P Million)

Original Construction by Provinces (Financed by internal generations or loans)	- P 135.0
Reimbursed to the Province by DLGCD (From Discretionary Funds P.D. 144)	- P 100.0
Reimbursed to GOP by loan funds in SLC (\$15.0 Million)	- P 100.0

2. Financial Procedures

USAID will use the Fixed Amount Reimbursement (FAR) procedures to finance this project. Basically this method is a contract in which the GOP mobilizes its own resources and assumes full responsibility for implementation of the project prior to disbursement of any loan funds. GOP/USAID have considerable experience with this financing method for it was used on a \$50 million grant made in 1972 for flood rehabilitation projects in the areas of schools, irrigation systems and flood works as well as provincial roads and bridges.

Based upon agreed direct cost (labor, material, POL and excluding contract profit, overhead and project supervision) at the time of final design of each sub-project, the DLGCD will reimburse the province after the A & E firm responsible for monitoring the project certifies that the sub-project was constructed according to the previously agreed plans and specifications. Periodically AID will reimburse the GOP by establishing a dollar credit in a Special Letter of Credit in a U.S. bank for that amount that DLGCD reimburses the provinces. The costs will be calculated in Philippine pesos and reimbursement by AID will be based on the official rate of exchange (currently ₱6.6672 to U.S. \$1) at the time that the sub-project is completed and accepted by DLGCD. AID reserves the right to review any sub-project file prior to or after reimbursement has been made. To the extent that USAID staff time permits, USAID will review as many sub-projects as possible.

3. Special Letter of Credit (SLC) Arrangement

As stated above, upon certification by the A & E firm that the sub-project was completed according to the previously agreed design and specifications, AID will credit the SLC by the agreed amount. In practice, the amount to be reimbursed for sub-projects will be accumulated and the SLC increased by the accumulated amount every six months. The SLC will be drawn down by the GOP with inputs from the U.S. The GOP has expressed the intention of procuring heavy construction equipment. However, the SLC is available for any purchase that the GOP may wish to make. As evidence of U.S. imports, only bills of lading and suppliers invoice will be required for payment by the U.S. bank. Other than source and origin requirements, no other procurement regulations will apply to the SLC.

4. Impact on U.S. Balance of Payments

There is no foreign exchange requirement as such for the project and no AID funds will be earmarked for such purpose. Since loan funds will be paid in the form of a SLC tied to U.S. procurement, there will be no direct impact on the U.S. balance of payments.

5. Philippine Economic Situation and Debt Service Capacity

Recent Economic Developments

In the past two years there has been a sharp increase in the level of economic activity in the Philippines. The growth in real GNP, which had been about 5-6 percent a year for more than a decade, doubled to 10 percent in 1973, and is estimated to be about 7 percent this year. The strong recovery in 1973 was led by the international commodity boom and resultant increased export incomes in the Philippines by a strong recovery in agricultural and industrial production for the domestic market, and by an expansion in public and private investment. Underemployment and unemployment remain quite high, however, and in common with most other countries, the rate of inflation increased appreciably in the past 18 months.

The agricultural sector grew by 7 percent in 1973. Rice production in crop year 1973-74 increased by 23 percent over the level of the previous year when flood severely affected output. This increase has been mainly due to favorable weather conditions, increased use of fertilizers, more supervised credit and increased investments in supporting rural services. The Government has moved ahead with its program of agrarian reform for the nation's one million rice and corn farm tenants. By mid-1974, 176,000 land transfer certificates had been issued, mainly to tenants on the larger holdings. The Government now hopes to issue certificates to all tenants on farms above 24 hectares. There is a strong prima facie case for pressing ahead with the program in the 7-24 hectare farm size range. Implementation below the 7 hectare level will be extremely difficult and benefits less obvious, in view of the numerous owners and tenants and small parcels of land held.

The industrial sector grew by about 12 percent in 1973. Non-traditional industrial exports, which have been increasing since 1970, are estimated to have doubled in 1973 to about \$200 million. However, industrial exports have been affected by the recent slowdown in the economies of key trading partners, and earnings are expected to level off this year.

The growth in production was also assisted by increased public development outlays in 1973 made possible by a significant improvement in the financial position of the Government. The ratio of public investment to GNP is currently about 3 percent compared with 1.8 percent in FY '72. The Government has implemented a series of long needed tax reform and improvements in tax administration. As a result, the ratio of National and Local Government tax revenues to GNP has increased from an average of 9 percent in recent years to an estimated 12.4 percent in FY '74.

High prices for the Philippines' chief exports, including coconut products, sugar, copper and wood products, were largely responsible for an increase in merchandise receipts of almost 70 percent in 1973. International reserves rose by about \$600 million during the year and stood at \$876 million, equivalent to about five months of imports, at the end of the year. However, since mid-1974, a large trade deficit has appeared, largely because the growth in export prices has moderated but import prices have continued to rise rapidly. Because of the very rapid growth in export income in the past two years, and continued good debt management policies of the Government, the burden of medium and long-term debt has declined dramatically. The ratio of debt service payments to export receipts has come down to an estimated 15 percent this year, compared with a high of 27 percent in 1971.

In the latter part of 1973 inflation emerged as a major problem. Since mid-1973 consumer prices have been rising at an annual rate of more than 40 percent. This has been caused by the large increase in liquidity since the export boom began in 1973, and by a number of cost-push factors, including the higher rate of world inflation, domestic food shortages and the increased cost of petroleum. Monetary and fiscal policies have aimed at absorbing the excessive liquidity expansion, and in recent months the rate of inflation has been moderating.

The Energy Crisis

Imported petroleum provides some 97 percent of the Philippines' total energy requirements. In 1973 the equivalent of 71 million barrels of petroleum crude and petroleum products were imported at a cost of about \$230 million c.i.f. When the energy crisis developed late last year, the Government moved quickly with conservation measures to reduce non-essential consumption. In 1974 imports of petroleum and products are likely to be about 71 million barrels at a cost of about \$780 million c.i.f.

The Government has decided to accelerate the development of local energy sources, especially hydropower and geothermal energy. Supplemented with nuclear energy in the 1980's, total demand for energy is expected to grow at about 10 percent a year, and even with more rapid development of natural power sources, petroleum would still account for more than 90 percent of total energy needs by 1980.

Growth Prospects

The abrupt deterioration in the external terms of trade since the middle of 1974, and the recession in the economics of key trading partners threatens some of the Philippine' recent economic gains. The labor force continues to grow at 3 percent a year, and although employment has expanded appreciably in the past 18 months, there is still widespread unemployment and underemployment.

Priority is being given to expanding food production for the domestic market, to expanding export production and to accelerating development of local energy resources. In the case of export production, the Government recognizes that the increased cost of petroleum and other imports cannot be financed indefinitely by borrowing abroad. It is actively encouraging both local and foreign investors to expand the productive capacity of export industries and to undertake major new import-replacing investments. The Government is seeking increased support from the international financial community to help carry out its development program and to ease adjustment to higher petroleum and other import prices. Because of the substantial improvement in the external debt burden and international reserve position in the past 18 months, the Philippines now has the capacity to borrow externally larger amounts of capital in support of its development program.

Maintaining a GNP growth rate of about 7 percent a year in real terms during the next few years will depend heavily on the buoyancy of the domestic market. The prospects are for continued expansion in agriculture, with a 4-5 percent increase in production in the year ahead. Continued expansion in public and private investment demand should help sustain industrial output expansion. Increased investments will be needed in a wide range of consumer and intermediate goods industries.

The increased size of the domestic market and growing export demand would seem to justify a wider range of investments during the latter part of the decade in large-scale, capital-intensive industrial projects, particularly in mineral-based processing industries where long-term comparative advantage may be strong. A number of big projects are proposed in mining, wood processing, fertilizer, steel and shipbuilding, which are likely to push up the private investment rate from recent levels of about 16 percent of GNP to perhaps 22 percent by the latter part of the decade. A substantial amount of the funds needed for these projects would have to come from external sources. But since the individual cost of many of them will exceed \$100 million, Consultative Group members can play an important role in helping the Government to obtain suitable co-financing arrangements, both with bilateral partners and with the private sector.

The public infrastructure program that was approved last year, which called for outlays of about P12 billion at current prices in FY '74-77, has become outdated because of the subsequent rapid inflation and by changes in investment priorities as a result of the energy crisis. A new program is being finalized, with more emphasis on developing nuclear and indigenous power resources and on irrigation, feeder roads and other projects to support increased food and export production. Public investment is likely to increase by about 15 percent a year in real terms so the ratio of public investment to GNP would rise from the present level of 3 percent to about 4 percent by 1977.

The domestic savings rate should rise from an estimated 19 percent of GNP at present to perhaps 20.5 percent by 1977. Foreign savings (i.e., the current account deficit in the balance of payments) would rise from an estimated 2.5 percent of GNP this year to about 4 percent in 1977. This foreign savings gap would decline in the latter part of the decade as the proposed investments in new export and import-replacing capacity begin to bring results.

Balance of Payments

Merchandise export receipts are projected to increase by a total of about 30 percent in the next two years. Import payments are projected to increase by a total of almost 40 percent in the same period, including a 30 percent increase in prices. Under these assumptions, the trade deficit would rise from an estimated \$680 million this year to about \$1,250 million in 1976.

Although exports are projected to grow more rapidly than imports in real terms over the next two years, this gain is more than offset by a cumulative decline in the external terms of trade of about 23 percent during 1975 and 1976. This would bring the terms of trade back to the level that prevailed in 1972, thus wiping out the gains made in the recent export price boom.

External Finance

If the projections of exports, imports and external terms of trade were to be realized, the Philippines would require a total foreign capital inflow of about \$2,340 million during 1975 and 1976 to cover the current account deficit and medium and long-term loan repayments.

Direct investment would provide about \$190 million of this. Greater use of short-term trade finance is expected because of the increased oil import bill and generally higher levels of imports. A net inflow of about \$480 million would be in line with the increase in the value of trade being financed. About \$1,080 million could be expected from supplier's credits and other medium and long-term loans to the private and public sector, including about \$280 million from project loans extended by Consultative Group members. The balance of the required capital inflow of about \$180 million in 1975 and \$410 million in 1976 would have to come from other borrowings. The Central Bank could finance the entire deficit by short and medium-term borrowing while maintaining or even increasing the level of international reserves. Net reserves, however, would be negligible by 1976.

The recent important gains in reducing the external debt burden and improving the external reserve position should not be lost now by excessive recourse to short and medium-term borrowing by the banking system. In these circumstances, foreign donors should consider extending quick-disbursing commodity loans with long maturities. Some assistance may also be forthcoming from the IMF.

With a combination of quick-disbursing commodity aid from Consultative Group members and assistance from the IMF, foreign exchange availabilities would be sufficient for import requirements in 1975, while at the same time maintaining a reasonable external debt profile. The much larger shortfall in foreign exchange availabilities projected for 1976 would have to be met with an appropriate combination of long and medium-term loan funds to prevent an undue increase in the debt burden in later years. Quick disbursing commodity aid on suitably long-term would again be needed. However, there is considerable scope for additional medium and long-term loans from donors to finance capital goods imports which are projected to reach \$1.2 billion in 1976. In the months ahead, the Government and aid donors alike should explore this possibility. If these efforts are unsuccessful, the Government would have to reassess its growth strategy for 1976.

If the projected inflows on the capital account are forthcoming, and if the presently identified shortfalls in foreign exchange availabilities are met with an appropriate combination of medium and long-term loan capital as suggested, management of the external debt and debt servicing should not present serious problems.

G. Evaluation Procedures

Following the steps described in the Rural Roads Administrative Procedures, each province participating in the program will prepare an Annual Implementation Plan (AIP) and submit it to the Department of Local Government and Community Development (DLGCD) in April 1975). From the list of projects in the approved AIP, DLGCD will designate one Major Feeder Road and one Penetration Road that each province will be required to evaluate in depth. (See CAP Annex XI page 2 for definition of Roads.)

Upon receiving the approved AIP, the province will immediately conduct extensive traffic counts on the major feeder road to accurately establish the current ADT. To the extent that current records and accounting procedures permit, the province will establish the current actual annual maintenance cost of the road in its present condition.

One year after the major feeder road has been completed, a review of the project will be conducted by the province to determine:

- (a) current ADT
- (b) actual construction cost
- (c) actual first year maintenance cost

A copy of these findings will be transmitted to DLGCD.

In the second, third and fifth year (after completion of the project), the province will again review the project and determine the current ADT and actual annual maintenance cost. A report of these findings will also be transmitted to DLGCD to be placed in the project file folder, and to AID for review and retention.

The province will promptly prepare a map covering the influence area of the penetration road designate in the AIP for an intensive evaluation. The existing land uses will be recorded on the map as well as all public facilities and private social service facilities. Family surveys will be conducted to establish the present population, production levels, crop marketing practices and the use and availability of public transportation.

This information will be recorded on a standard format and a copy transmitted to DLGCD to be placed in the project files, and to AID for review and retention.

At the end of the first and second year after the project has been completed, the province will conduct a casual review of the project. This review will be sufficient unless factors are observed that indicate the need for a more extensive study at that time.

Three years after the project has been completed, the province will prepare a new land use map of the influence area and obtain and record the corresponding information that was obtained at the start of the project. The province will analyze the changes that have occurred and record their finding in a formal report that will be transmitted to DLGCD. (A copy of the raw data will be included with the final report). AID will also be included for review and analysis.

When the provinces submit their second AIP in April 1976, DLGCD will designate a minor feeder road in each province that will be subject to an intensive evaluation. (The 4 provinces submitting their first AIP will each evaluate a Major Feeder Road and a penetration road following the procedure outlined above). The provinces will immediately conduct traffic count studies to accurately determine the current ADT. Each province will determine the development influence area of the minor feeder road and prepare a map of same on which is also recorded existing public facilities and private social service facilities (The term "development influence area" means the area in which the "influence" is similar to that of a penetration road). A survey will be conducted in the development influence area to obtain and record the same type of information that was obtained for the penetration road in the prior year.

One year after the minor feeder road has been completed, a review of the project will be conducted by the province to determine:

- (a) current ADT
- (b) actual construction cost
- (c) actual first year maintenance cost

At the same time the province will make a limited survey of the development influence area to determine whether or not there is a need for a more influence area to determine whether or not there is a need for a more extensive survey at that time. These findings will be incorporated in a report and transmitted to DLGCD and AID for review and retention.

The first year process will be repeated in the second year after the project has been completed.

Three years after completion of the minor feeder road, the province will conduct an extensive review of the project. The province will prepare a new land use map of the influence area and obtain and record the corresponding information that was obtained at the start of the project. The province will also establish the current ADP and current annual maintenance cost. The province will analyze this information and record their findings in a formal report that will be transmitted to DLGCD (a copy of the raw data will be included with the formal report) and AID for review and analysis.

In May 1975, after the first AIP's have been approved, PDAP will assist each participating province in the selection of a Mayor Feeder Road, a Minor Feeder Road and a potential Penetration Road that meet the program criteria, but are of lower priority. The province will then obtain the same baseline information for each type of road as described above. These three selections will serve as a control. A copy of this information will be transmitted to DLGCD and another copy retained by the province.

In May 1977, the provinces will collect the same type of information on the three control roads as they obtained in May 1975. The province will analyze the changes and submit a report of their findings to DLGCD. These results will be compared to changes that have occurred in the areas where roads have been constructed.

As new provinces enter the program, PDAP will assist in the selection of similar control roads for which the respective province will obtain the necessary baseline data.

Additional details concerning the preparation of the (sub) project evaluations will be included in Supplement F of the Rural Roads Administrative Procedures.

DLGCD, PDAP and USAID will review the results of the project evaluations during the first two years of the program before finalizing evaluation procedures for the third year.

SECTION III - LOAN ADMINISTRATION

A. Target Dates

On the assumption that this loan will be authorized in November 1974, the Loan Agreement will be negotiated during the month of December 1974 and signed prior to December 31, 1974.

Since loan funds will not be disbursed until a considerable number of sub-projects are actually designed, constructed and found acceptable, it is anticipated that the first disbursement will not take place before June 1975. To insure timely implementation of this project, AID will require that all CP's be met prior to approval of any sub-project by DLGCD. Final disbursement will occur prior to December 1978.

By March 31, 1975 the involved provinces should have established their training programs for the sub-project economic evaluation, DLGCD should have contracted for the A & E firm to monitor the project and the preliminary sub-project selection made according to the PDAP Administrative Procedures.

B. Disbursement Procedures

The reimbursement by DLGCD to the provinces will follow the standard practice established by PDAP and detailed in the Administrative Procedures. DLGCD will accumulate reimbursement claims paid and quarterly present them to AID for dollar reimbursement in the Special Letter of Credit. After review of all reimbursement claims and supporting documentation, the USAID Assistant Director for Provincial Development will request AID to reimburse the GOP for the agreed amount in the Special Letter of Credit in the U.S. bank designated by the GOP. Subsequent reimbursements will be additions to the SLC.

C. Monitoring Responsibilities

The Provincial Engineer in each province will be primarily responsible for implementing including monitoring the project in their respective provinces. DLGCD will contract with local A & E firms to provide independent monitoring of the Project. The A & E firm will be responsible for (a) reviewing each sub-project design and specification and

recommending to DLGCD the amount of the cost reimbursement portion, (b) inspecting and monitoring sub-project construction to assure conformity to previously agreed design and specifications, (c) inspect each sub-project after completion and recommend reimbursement or reject the project and recommend that reimbursement be withheld. The forms and procedures used in project monitoring are detailed and illustrated in the Administrative Procedures.

D. Reports

The reporting procedures and forms required of each participating province are contained in the Administrative Procedures. Basically, each province will submit a monthly report to DLGCD and USAID on the status of the Project.

E. Conditions Precedent

The major conditions precedent required of the Borrower and/or the DLGCD in addition to the standard CP's prior to any disbursement of loan funds are recommended as follows:

1. Written assurance from the Bureau of Public Highways, endorsed by the Borrower (GOP), that all roads and bridges improved/constructed under this project will be eligible for classification as Provincial Roads and therefore eligible for annual maintenance funds as specified in Presidential Decree 17 and -320.
2. Written assurance from the Borrower (GOP) that annual maintenance funds will be provided as specified in Presidential Decrees - 17 and 320 for each road improved/constructed under the Project.
3. DLGCD will be required to provide AID with a three-year implementation plan, including projection of funds for contracting with local A & E firms.
4. DLGCD will contract with a local A&E firm, with concurrence of USAID to provide above described review and monitoring services.
5. Conditions Precedent are outlined in more detail in the draft Loan Authorization attached as Annex I.

DRAFT

AID-DLC/P-2059

**DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D. C. 20523**

ANNEX ONE

Page 1 of 3

**OFFICE OF
THE ADMINISTRATOR**

Loan No. 492-

CAPITAL ASSISTANCE LOAN AUTHORIZATION

Provided from: Food and Nutrition
(Philippines: Rural Roads Loan)

Pursuant to the authority vested in me as Administrator, Agency for International Development ("A.I.D."), by the Foreign Assistance Act of 1961, as amended, (the "Act") and the Delegations of Authority issued thereunder, I hereby authorize the establishment of a loan pursuant to Part I, Chapter I, Section 103 and Chapter 2, Title I the Development Loan Fund, to the Government of the Republic of the Philippines ("Borrower") acting through the National Economic Development Authority of not to exceed Fifteen Million Dollars (\$15,000,000). The proceeds of this loan will be used to reimburse the Borrower for up to seventy-five percent of the peso costs of a program of subprojects executed by participating Provinces to construct or improve approximately 750 kilometers of rural roads and 2400 linear meters of related bridges in provincial areas of the Philippines. The loan shall be subject to the following terms and conditions:

1. Interest Rate and Terms of Repayments

The loan shall be repaid by the Borrower within forty (40) years after the date of the first disbursement under the loan, including a grace period of not to exceed ten (10) years. The interest on the unrepaid principal balance of the loan shall be from the date of first disbursement at the rate of (a) two percent (2%) per annum during the grace period, and (b) three percent (3%) per annum thereafter.

2. Currency of Repayment

Provision shall be made for repayment of the loan and payment of interest in United States dollars.

3. Other Terms and Conditions

Unless A.I.D. otherwise agrees in writing,

(a) Goods and services financed under the loan shall have their source and origin in the Philippines

(b) The loan agreement shall provide that prior to the commencement of the first subproject, the Borrower shall submit or cause to be submitted, the following in form and substance satisfactory to A.I.D.:

- (1) Written assurance from the Borrower that sufficient funds from the Presidential Discretionary Fund will be made available to the Department of Local Government and Community Development ("DLGCD") for the purpose of reimbursing each participating Province for the agreed amount with respect to a satisfactorily completed subproject.
- (2) A project implementation agreement, the terms of which cannot thereafter be materially modified or amended without the prior written consent of A.I.D., which project implementation agreement will be executed by DLGCD and each participating Province. This agreement shall contain, inter alia, the qualification criteria for each Province and subproject and a provision requiring, under appropriate circumstances, A.I.D. approval of construction and procurement contracts and firms selected to perform these services.
- (3) A copy of an executed contract or contracts with an engineering firm or firms satisfactory to A.I.D.
- (4) Written assurances from the Borrower and the Bureau of Public Highways, that all roads and bridges improved or constructed under this Project will be classified as provincial roads and therefore eligible for annual maintenance funds, and that such funds will be provided, both in accordance with Presidential Decrees 17 and 320.

- (5) A three year implementation plan prepared by DLCCD, including a projection of funds available to finance contracts with the engineering firms required under (3) above.
- (6) Such other conditions as A.I.D. may deem advisable.

(c) The loan agreement shall contain the following special covenants by the Borrower:

- (1) The Project will be implemented, on behalf of the Borrower, by DLCCD.
- (2) The DLCCD will assure that the terms and conditions of each project implementation agreement are observed by each of the parties thereto.
- (3) DLCCD will assure that Project Evaluation Procedures are implemented.
- (4) Such additional covenants as A.I.D. may deem advisable.

(d) The loan agreement shall include such other terms and conditions as A.I.D. may deem advisable.

Daniel Parker

Date

U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT
Manila, Philippines

AID-DLC/P-2059

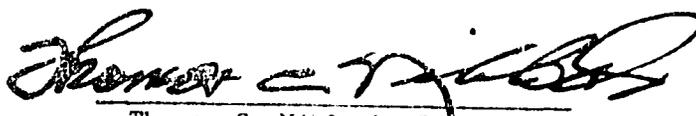
Ramon Magsaysay Center
1680 Roxas Boulevard

Telephone: 59-80-11

CERTIFICATION PURSUANT TO SECTION 611(e)
OF THE FOREIGN ASSISTANCE ACT OF 1961, AS AMENDED

I, THOMAS C. NIBLOCK, the principal officer of the Agency for International Development in the Philippines, having taken into account, among other things, the maintenance and utilization of projects in the Philippines previously financed or assisted by the United States, do hereby certify that, in my judgment, the Philippines has both the financial capability and the human resources capability to effectively maintain and utilize the proposed Rural Roads Loan.

This judgment is based upon the project analysis as detailed in Philippines Rural Roads Capital Assistance Loan Paper and is subject to the conditions imposed therein.



Thomas C. Niblock, Director
USAID/Philippines

16 Oct 1974
Date

PROVINCIAL DEVELOPMENT ASSISTANCE PROJECT

Fourteen Proposed PDAP Provinces for RRJLP
Percentage of Farmers, Area Production
and Crop Value From National Figures

	FY 73 *National	FY 73 PDAP	% of National Total
<u>Farmers</u>			
No. of Rice Farmers	1.0 M	*387,428	38%
No. of Corn Farmers	.35 M	* 92,281	26%
<u>Area Cultivated</u>			
Rice	2.5 M	**937,445	37%
Corn	2.1 M	**280,685	13%
<u>Production</u>			
Rice - 108,695,650 Cavans		***61,704,042	56%
Corn - 40,000,000 cavans		*** 5,145,737	12%
<u>**Value</u>			
Rice - P3,347,826,024.00		P190,048,499,260.00	56%
Corn - P1,140,000,000.00		P 14,665,350,450.00	12%

*National Data

National Food and Agriculture Council (NFAC)

** Price

Rice - P30.80 per cavan

Corn - P28.50 per cavan

*** - 14 out of 72 Provinces

PDAP Data

* 1973 Philippine Almanac

** NFAC

*** NFAC

DEFINITIONS

- ADPD - Assistance Director Provincial Development
- DLGCD - Department of Local Government and Community Development
- G O P - Government of the Philippines
- NEDA - National Economic Development Authority
- PDAP - Provincial Development Assistance Project
- P D S - Provincial Development Staff
- P E O - Provincial Engineering Office

Capital Improvement Program - a comprehensive five year listing of major public improvement projects in a proposed priority, time and funding frame.

Provincial Road Network Development Plan - a comprehensive inventory of existing roads of all classes and projections of road requirements for the future, construction schedules, funding, and supporting geological, geographical and socio-economic data.

Agriculture Section Inventory and Profile - a description of the magnitude, nature, and supporting resources of the agricultural sector.

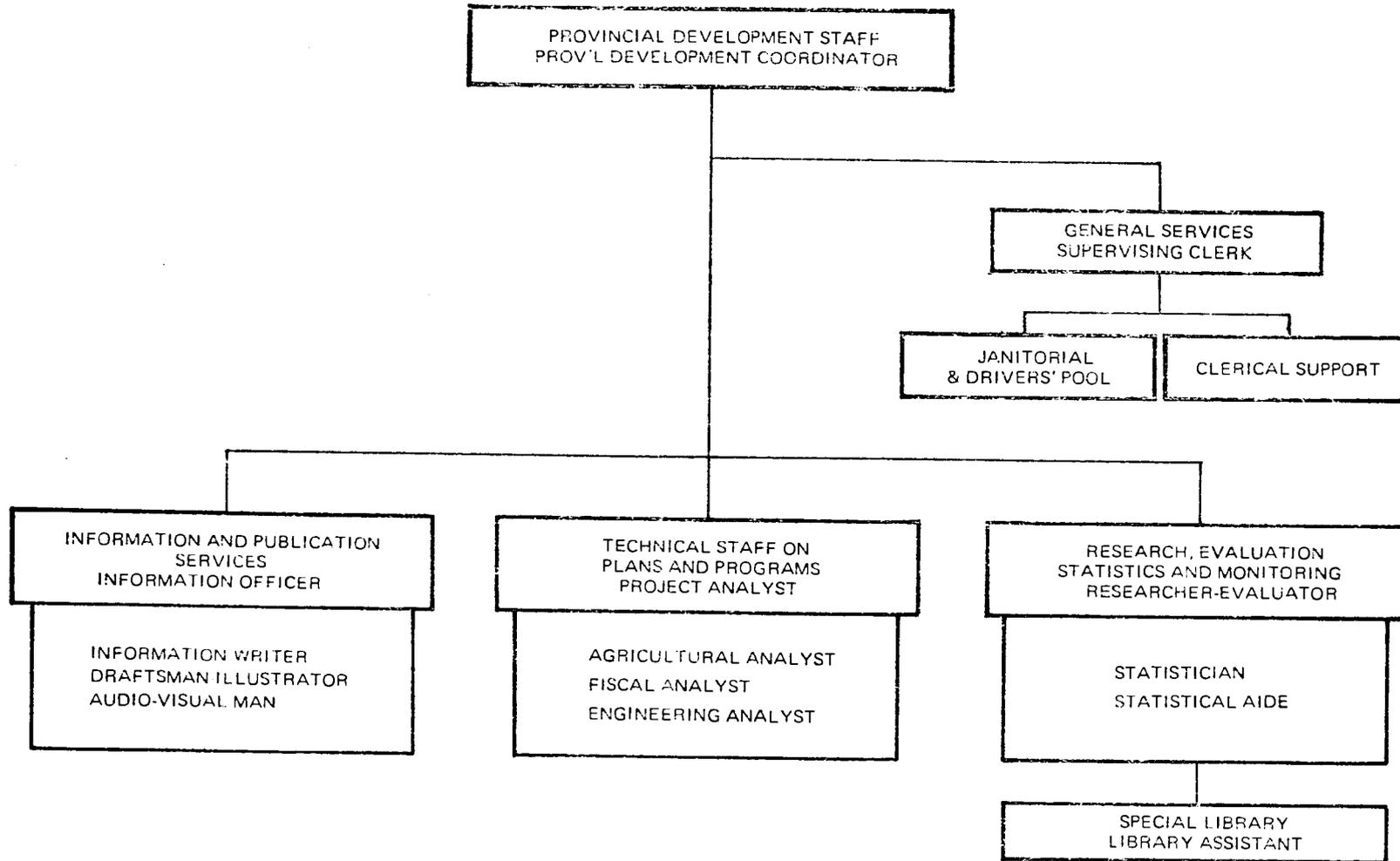
Special Infrastructure Project - a project under an agreed reimbursement to participating provinces for approved infrastructure projects completed according to agreed plans and specifications.

PROVINCIAL DEVELOPMENT ASSISTANCE PROJECT

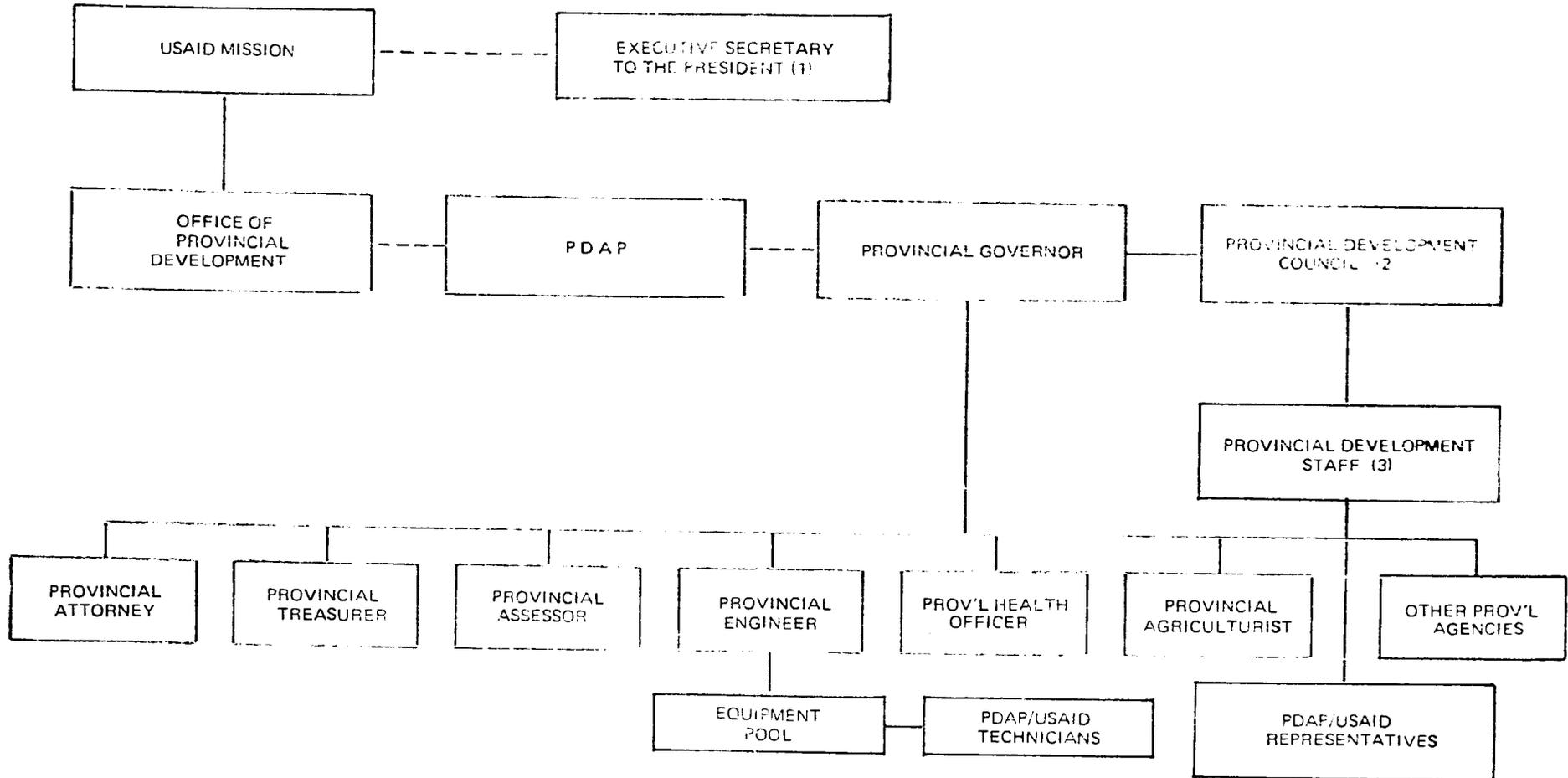
UNITS OF EQUIPMENT RECEIVED FROM PDAP/USAID DURING FY 74 AND TOTAL FLEET STRENGTH AS OF JUNE 30, 1974

CATEGORY	UNITS OF EQUIPT. RECEIVED FROM PDAP/USAID							TOTAL FLEET	Total Units OAC
	A	B	C	D	E	F	G	STRENGTH	
DESCRIPTION	Self-Propelled Construction Equipment	Towed Construction Equipment	Trucks Over 3/4 Ton	Support Vehicles	Auxiliary Field Units	Miscellaneous Construction Equipment	Major Shop Equipment	Total Units Assigned To Provincial Equipment Pool as of June 30, 1974	
PROVINCE									
08 La Union	5	6	17	12	3		2	45	328,300
13 Pangasinan	46	6	75	12	8	4	16	167	1377,000
16 Zambales	26		25	23	5		18	98	1747,762
18 Bataan	9	2	10	18	1			40	301,000
19 Pampanga	19	9	27	24	8			87	656,014
20 Bulacan	42	5	32	42	10	2	13	148	517,450
24 Batangas	21	5	19	23	2		5	75	617,400
26 Camarines Sur	18	4	22	23	4		11	82	565,800
29 Mindoro Oriental	25	4	32	18	12		18	109	692,800
41 Iloilo	12	2	18	20	5	1	12	70	492,240
52 Misamis Oriental	20	3	19	29	8	11	23	113	1520,225.95
61 So. Cotabato	38	6	32	8	14	3	45	146	1094,200
63 Davao (Norte)	13	2	18	24	5	1	14	77	602,200
66 Palawan	18	5	15	19	10	18	2	87	3475,900
TOTAL	312	59	364	295	95	40	179	1344	12988,291.95

PROVINCIAL DEVELOPMENT STAFF



PROVINCIAL DEVELOPMENT ORGANIZATION



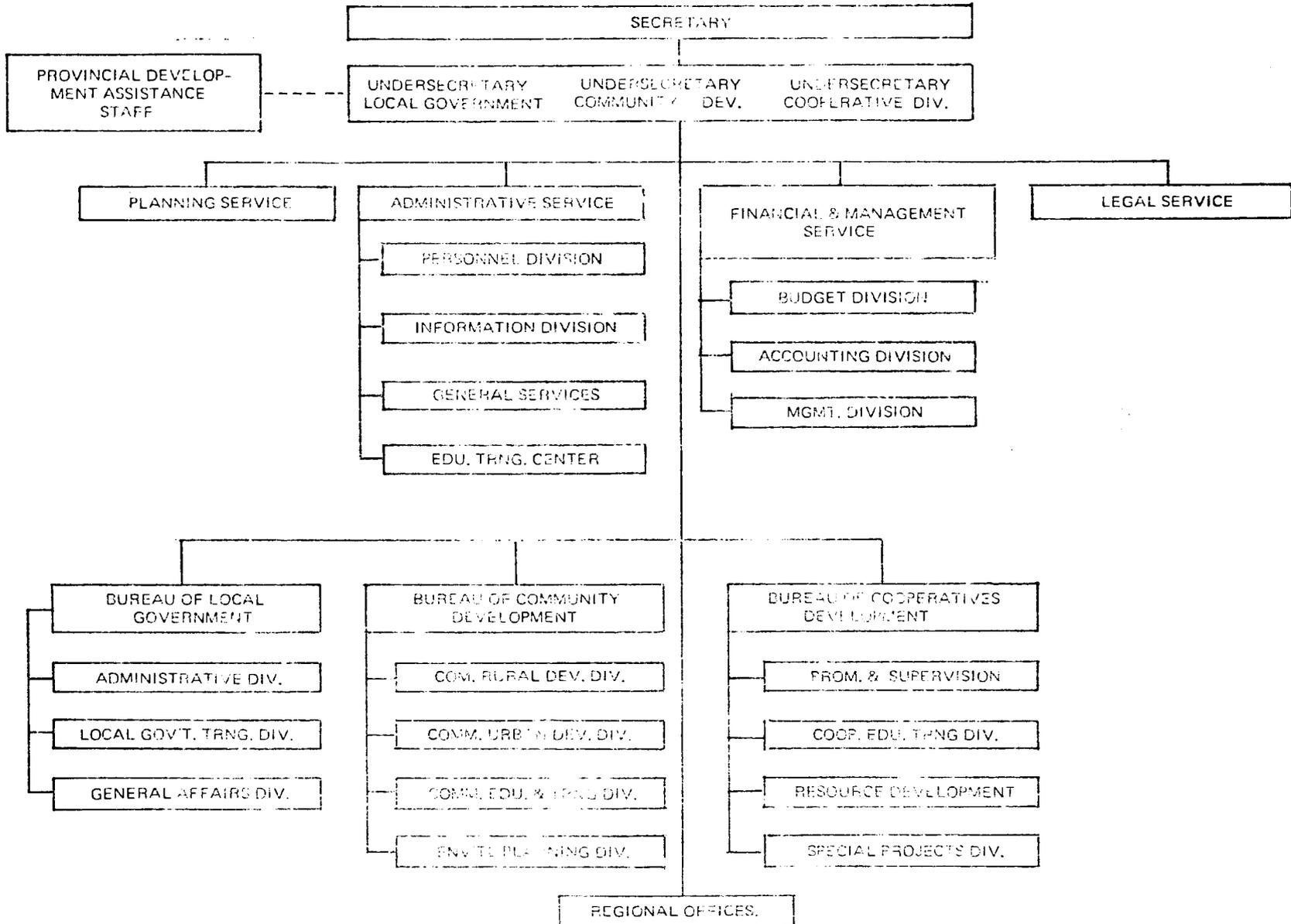
- (1) PDAP Transferred from National Economic Council to Office of the Executive Secretary to the President
 (2) Chiefs of Provincial and National Offices are members of Provincial Development Council
 (3) Recommended Composition of Provincial Development Staff:

Chief: Provincial Development Coordinator

Staff: Project Analyst
 Fiscal Analyst
 Engineering Analyst
 Agricultural Analyst
 Statistician

Researcher
 Draftsman/Illustrator
 Information Writer
 Family Planning/Nutrition
 Liaison Officer

DEPARTMENT OF LOCAL GOVERNMENT AND COMMUNITY DEVELOPMENT



Office of the Executive Secretary
Malacañang, Manila

September 19, 1974

Mr. Thomas C. Niblock
Director
US Agency for International Development
Roxas Boulevard, Manila

Dear Mr. Niblock:

We plan to undertake a Rural Roads Program that would upgrade existing local government-funded road systems and construct new ones in provinces covered by the Provincial Development Assistance Project (PDAP). The initial phase of this program will construct approximately 750 kilometers of rural roads and some 2,500 meters of bridges at an estimated cost of P130 million (\$19.3 million). Approximately P100 million (\$15.0 million) will be reimbursed to the provinces by the national government. The balance will be the province counterpart.

This program will be implemented by the Department of Local Government and Community Development (DLGCD), initially, with the assistance of PDAP. Implementation will be on a reimbursement basis similar to that in the PDAP Flood Rehabilitation and Special Infrastructure Programs, utilizing the Discretionary Funds provided in Presidential Decree No. 144.

To assist us in implementing this program, we would like to request your consideration of a \$15 million project loan under the most favorable AID terms. We also propose that this loan be in the form of a Special Letter of Credit in a US Bank for GOP purchases (primarily of new equipment) in the US. GOP plans to transfer these equipment to provinces and cities on a deferred payment arrangement.

May we, therefore, request your assistance in obtaining the above-mentioned loan. Our government gives the assurance

- 2 -

that its contribution to the program will be expeditiously made and that the concomitant obligations to maintain the value of the capital investment will be met in accordance with agreed procedures.

Very truly yours,

By Authority of the President:


ALEJANDRO MELCHOR
Executive Secretary

Economic Analysis - Discussion and Methodology

1. Rationale

The need to evaluate public investments such as those used for establishing road transport or improving road transportation has been well established. Sufficient funds are generally not available to perform all of the public investment projects, which are desired. The construction of rural roads competes inter-sectorally with potential public investment in education and irrigation, for example, as well as competing intra-sectorally with possible investments in other transport modes such as railroads, and water transportation. Those who make investment decisions in the road transport sub-sector must choose projects for implementation from among project possibilities ranging from relatively high standard roads to rudimentary single lane earth or gravel roads.

Methods have been devised to assist public investment analysts in deciding which investments should be undertaken. These methods are based on one criterion. Those projects with the highest socio-economic benefits relative to costs shall have a higher implementation priority than those of lower benefits to costs. Since the reimbursable portion (75% of the total costs) of the costs of rural roads selected for improvement will be a loan to the Republic of the Philippines and as such shall be allocated by the government to the provinces, common criteria should be applied in the selection of roads to be improved or constructed. The purpose of the development of an economic methodology is to ensure that all projects pass the same tests. Also, consideration should be given to the extent of the social enrichment of the population served by each road and other socio-economic effects.

There are inherent conceptual and practical difficulties in estimating the benefits to small farmers from improved transportation. The main benefit would be increases in small farmer income. However, some benefits are not easily measurable in terms of income. These benefits may be more important than those which are measurable. The improvement of rural roads may open up or improve access for the population of certain areas to health and education facilities and to community development programs. In the methodology proposed here, savings in transport costs and/or increased income to small farmers and road maintenance cost differences will be the major benefits. Benefits stemming from the enrichment of rural life due to road improvement or construction shall consider whether the population served shall reap average, or above average social benefits as well as identify other socio-economic effects.

2. Economic Evaluation

The underlying concept for evaluation is the "with or without" criterion. The analyses shall seek to measure the benefits relative to costs without road improvement or construction and with road improvement or construction. Improved rural roads will reduce transportation costs & stimulate marketable agricultural production and facilitate commercial activity for rural areas particularly in the movement of agricultural inputs to the producing areas and the movement of agricultural surpluses to markets and processing (agro-industrial) facilities. Small farmer communities may also be linked by all weather access to medical, educational, agricultural, extension and other services and ideas thus contributing to the enrichment of rural life.

For minor feeder and penetration roads the stimulation of marketable agricultural surpluses would substantially increase small farmer income. Crops produced for consumption by a farmer's family will not be materially affected by road improvement. This analysis therefore concentrates on crops produced for sale outside of the immediate producing area.

Rural roads can be functionally divided into three categories based upon their service to agriculture, the area served, traffic levels, road condition and the anticipated benefits from road improvement. These are major and minor feeder roads and penetration roads.

a) Major Feeder Roads

Major feeder roads serve as a main access route to agricultural areas connecting poblacions and produce collection centers to the primary road network. Current traffic levels are high on major feeder roads and they are usually open to traffic throughout the year. Although operating costs are high because of low construction and maintenance standards, these roads do not significantly hinder the transport of agricultural inputs or of commodities to market. The major result of improvement will be the lowering of transportation costs (reduced vehicle operating costs). Present users of the road and those who would normally be using the road in the future will incur lower costs for operating their vehicles. The present value of the algebraic sum of annual vehicle operating cost savings and road maintenance cost differences are compared with the present value of construction costs to determine the probable return on investment.

b) Minor Feeder Roads

Minor feeder roads serve smaller producing areas and communities. They are in general closed part of the year

or are very difficult to negotiate in the rainy season. Traffic levels are moderate to low. These roads are a first link in the farm to market transport system connecting agricultural producing areas to nearby poblacions and produce collection and storage centers and/or the major feeder road networks. Increased agricultural production is a basic reason for road improvement and should result from extended road use in the rainy season, thus allowing more production to reach markets and inputs to reach the producing areas. Forecasts of induced production over the analysis period, net of other economic costs is the bases for estimating benefits of road improvement. Vehicle operating costs savings are small in scarcely populated areas because of low traffic levels but can be a significant factor for some minor feeder roads when present traffic is higher. The present value of the algebraic sum of the net income to small farmers from agricultural production generated by road improvement, vehicle operating cost savings and annual road maintenance cost differences are compared with the present value of construction costs to determine the probable return on investment.

c) Penetration Roads

Penetration roads usually involve new construction or improvement of low standard roads or tracks. Penetration roads can open up entirely new areas to settlement or serve areas where cash crop production is very small due to lack of transport facilities. Dry weather access is difficult and in some cases impossible due to the lack of bridges over perennial streams. Traffic levels are very low to non-existent. There is a high uncertainty as to the rate and type of development which could be expected from the establishment or improvement of penetration roads. Stimulated agricultural production is the main benefit to be derived from penetration roads. The present value of the algebraic sum of the net income to small farmers from agricultural production generated by road improvement and annual road maintenance cost differences are compared with the probable return on investment. Penetration roads may also be evaluated as part of a sub-project scheme. Here a package approach can be used.

3. General Considerations

a) The Data Base

The Philippine Bureau of Census and Statistics has produced a 1960 agricultural census for each province. These are disaggregated to the municipal level. A similar census has been conducted for 1971 which at present exists in the form of computer runs. Existing population statistics including the farm population allow estimates of agricultural production in the influence area of the roads and therefore truck and passenger traffic over the roads with changes over the 1960 and 1971 period. Data can also be obtained to determine the net returns to farmers by crop.

Traffic surveys have been conducted along some of the roads to be evaluated in the selected provinces. No origin and destination surveys have been conducted on these roads. For existing roads, estimates of current passenger and cargo traffic shall be based on these actual traffic counts and on estimates generated by simplified passenger and truck traffic models. Traffic count estimates are not likely to reflect the seasonal variation of traffic over a sub-project. Such seasonal variations which depend particularly on the time pattern of agricultural activity and weather in the influence area, may be considerable. The traffic count results, therefore, will have to be cross-checked and modified by traffic estimates using passenger and truck traffic models for feeder roads which have been specified empirically in an IBRD study conducted by two consulting firms, Norconsult A.S. and HOFF and OVERGAARD. These models may be used to estimate coverage annual daily traffic generated by population and agricultural activity in the influence area. The model estimates exclude through traffic but in any case, such traffic constitutes a minor portion of total traffic for most of the sub-projects. Traffic projections are also based on these modified models, which are presented later in Annex XII. Road construction standards are based on projected traffic volumes and composition at the end of the evaluation period.

Unit parameters for vehicle operating costs for varying types and conditions of pavement and operating speeds have also been developed in the recent study of feeder roads conducted for the IBRD. These parameters are also shown in Annex XII. The parameters, particularly those applicable to passenger traffic, will require minor adjustments to realistically reflect average passenger traffic conditions on a participating province's sub-projects. The adjusted cost parameters, together with information on the present and projected (after improvement) pavement type and condition and operating speed, shall be used as data inputs for determining vehicle user cost savings. In the interest of simplification, time savings from increased vehicle speeds has not been considered. The results will not be affected significantly. User cost savings (per truck-km. or passenger-km.) resulting from road improvement will be assumed constant throughout the project lifetime.

b) The Evaluation Period

Annual projections of benefits and costs are prepared for a 10-year periods for roads to be improved or constructed to gravel standards. The additional benefits and costs after the 10-year period, should not significantly affect the internal rate of return of IRR's near 15%. Roads to be considered for improvement to higher than gravel standards will be evaluated over a 20-year period.

c) Construction and Maintenance Costs

The Engineering analysis, including the selection of design standards, cost estimates, and maintenance are discussed above in Section II B. Certain engineering elements are discussed here to guide the economic analyst in handling the engineering elements.

i) Construction Costs

Construction costs vary with the design standards adopted for the road to be improved, or constructed. Total construction costs minus taxes are used (see Section II in text). Design standards will depend on the magnitude and composition of traffic at the end of the design period. Gravel roads are assumed to have a project life of 10 years. However, items such as major RCDG bridges are assumed to have a life of 30 years. The present value (at 15%) of the surplus or remaining utility of major drainage structures has been found to be over 20% of the original cost. For the IRR computations, 20% of the original cost of major drainage is used to estimate the present value of the remaining utility for gravel roads and as such is treated as a benefit. Factors shall be calculated later for higher standard roads.

ii) Maintenance Costs

Optimal maintenance costs levels vary with the magnitude and composition of traffic, pavement surface and width, and engineering design standards. Maintenance cost differentials will occur in upgrading a road to a higher standard. Usually these differences reflect higher maintenance costs for the improved road during the early years after construction. After some years the situation is reversed and maintenance cost savings are incurred. These differences should be handled as either negative or positive benefits in the analysis. In order to be consistent, maintenance costs for the construction of penetration roads shall be treated as negative road maintenance savings, i.e., they will subtract from the benefits. Maintenance cost savings for improved roads constitute a small portion of total benefits and will likely have little effect of the internal rate of return. A number of projects could be analyzed to determine the sensitivity of the IRR's to the consideration of negative and positive maintenance cost savings. Except in unusual circumstances, annual maintenance costs should be ignored or quickly computed for inclusion in the analysis.

d) Vehicle Operating costs savings

Vehicle operating costs savings are the major benefit for major feeder roads and can be important for minor feeder roads now carrying significant traffic volumes. After some experience with

the analyses, of minor feeder roads, the Provincial Development Staff should be able to develop some cutoff points based on the magnitude and composition of present traffic below which the consideration of vehicle operating cost savings does not contribute meaningfully to the determination of the internal rate of return. For calculating vehicle operating cost savings the following steps are required:

- Annual Average Daily Traffic (AADT) is estimated from actual traffic counts or on estimates generated by simplified passenger and truck models as described later in Annex XII. These calculations involve estimating traffic costs per passenger-kilometer and truck-kilometer along the road in its existing and in its improved condition. The differences are the estimated savings per passenger-kilometer and truck-kilometer due to road improvement. Projected population and production in the road influence area are converted to annual passenger-kilometers and annual truck-kilometers based on modified passenger and truck traffic models. By multiplying unit savings by the annual passenger and truck kilometers, annual vehicle operating cost savings are obtained for the evaluation period.

e) The Influence area of the Roads

The influence area of a road is defined as the geographical limits over which farmers depend on a road for the movement of passengers and goods into and out of the area. The influence area should be determined on the basis of relevant topographical features and the existence of planned construction of alternative means of transport. In the absence of sufficient information, analysts may wish to consider the influence zone of a road as equal to the total land area within one kilometer deep on both sides of a road.

4. The Evaluation of Rural Roads

a) Major Feeder Roads

The benefits from the improvement of major feeder roads will be:

- Vehicle operating cost savings
- Annual road maintenance costs differences (positive or negative)

The costs incurred in the improvement of major feeder roads are:

- Construction costs

The economic evaluation of major feeder roads will consider vehicle operating cost savings and maintenance cost differences as the benefits to road improvement. The basic methodology is well known and has been simplified as much as possible here to facilitate its use by the PDS's without compromising its utility as an effective aid to decision making. The algebraic sum of the present value of annual vehicle operating cost savings and road maintenance cost differentials are compared with the present value of construction costs to determine the probable return on investment.

b) The Agro-Economic Approach for Minor Feeder and Penetration Roads

The evaluation methodology consists of an agro-economic approach and a qualification of the social effects of the road sub-projects as well as other socio-economic factors. Minor feeder and penetration roads will generally be improved or constructed to gravel standards.

The agro-economic approach seeks to measure the main result of rural road improvement - the stimulation of marketable agricultural surpluses. It is not expected that crops produced for consumption by the farmer's family will be affected by improved roads. The evaluation therefore concentrates on the small farmer's agricultural surpluses. The analysis seeks to measure how affected farmers will respond to improved transport.

Improved access to producing areas should induce more production in several ways. Most importantly, perishable crops which are harvested during the rainy season can be moved immediately to markets or to processing facilities. It has been found, for example, that farmers with poor access to markets in Iloilo Province could incur higher costs in having certain perishable crops carried to the market than the possible sale price at the market. These crops are now left to spoil or given to domestic animals. Improved all weather roads ensures that agricultural inputs such as fertilizers, insecticides and improved planting material will be available when needed, especially during the wet season. Improved roads should make the extension officers more effective.

The importance of transportation in facilitating economic and social development and in improved transport services in stimulating development has long been recognized. However,

theoretical problems arise in determining the net induced benefits due to the road alone and practical problems of measurement emerge. A minor feeder road or penetration road is normally expected to provide relatively larger development benefits - proportionate to total benefits - than is true to improvement of a major feeder road. Indeed, the development effect is basically the reason and justification for minor feeder and penetration roads. Economic feasibility depends upon the extent to which the absence or inadequacy of such roads imposes a constraint on production. However, recognition and consideration must be given to non-road factors which may constitute production constraints. For agricultural development to take place, adequate feeder roads are a necessary condition; on the other hand, improved roads alone may not be a sufficient condition to induce development. Other major constraints shall be identified in the sub-project analyses. To the extent possible, a coordinated program should be developed to deal with these problems and transport improvement, simultaneously.

The importance of minor feeder and penetration roads for marketed crop production varies with each crop. The timing of planting and harvesting, the level of inputs to production and the storability of the crop are the most important factors. The major crops in the selected provinces should be examined and classified relative to their sensitivity to road conditions.

i) Response to Road Improvement

The analysis assumes that induced agricultural benefits will accrue due to road improvement in the first year immediately following construction. The assumption is that farmers will respond by more intensive and extensive agricultural methods to increase marketed production of crops already under cultivation on their farms. Some crop diversification is also anticipated but time, type and rate of these changes is highly uncertain. No attempt has been made to estimate the benefits from crop diversification in the sub-project areas.

ii) Projecting Future Production

Projecting future production requires forecasts of the volume of selected priority crop production in each service area without road improvement and with road improvement. Over the 10-year period the "without" forecast assumes no improvements are made to the roads and other conditions remain unchanged. The "with" forecast for agricultural production assumes that road improvements will be undertaken but that other conditions remain unchanged. This forecast quantifies the importance of road conditions as a factor affecting the marketed production of each

crop. The difference between both forecasts is the incremental production likely to be induced by road improvement.

Incremental Production estimates are based on an agro-economic analysis of the area served by the road. Two production forecasts for each major crop are required over the 10-year evaluation period. The first assumes no changes in the road conditions and would in most cases be a projection of historical trends from the 1960 and 1971 agricultural census data or other available data. Production forecasts assuming road improvement is the most crucial part of the analysis and it is unlikely that any short cuts each be substituted here for the analyses and judgments required. The analysts has already determined via the preliminary screening criteria that poor transportation is a major constraint to increased production. He should be able to substantiate that:

- Agricultural yields are lower in the road service area than elsewhere in the Province for areas of similar characteristics and growing patterns and/or
- Show that idle lands suitable for the crops under consideration exist.

The stream of differences between the forecasts represents the incremental production attributable to road improvement:

iii) Valuing Forecast Production

The issue of shadow pricing sub-project inputs and outputs has been examined, and it has been concluded that only the unskilled labor input needs to be shadow priced. No serious distortions are likely to be introduced into a sub-project analysis if prevailing market prices are used for other inputs and outputs. The shadow price for unskilled labor will of course vary from province to province, depending on local labor market conditions. The PDS shall endeavor to provide guidance for participating provinces on the determination of appropriate shadow wage rates for unskilled labor.

Forecast production is valued by current on farm prices. The internal rate of return comparisons for each road are based on the net value to farmers of the estimated incremental production induced by road improvement, excluding all factor costs to the farmer. Sufficient data should exist to allow the calculation of the net value of the incremental production by crop. As experience is gained by the PDS, coefficients by crop representing the percentage of gross income which estimates the net income to the farmers should be developed.

c) Minor Feeder Roads

The benefits from the improvement of minor feeder roads will be:

- incremental marketable crop production leading to increased net income to small farmers.
- vehicle operating costs savings
- road maintenance cost differences (positive or negative)
- the enrichment in the quality of life in rural areas (social benefits) and other socio-economic effects.

The costs incurred in the improvement of minor feeder roads are:

- construction costs.

i) The enrichment in the quality of life in rural areas
Social Benefits are benefits which are not easily quantifiable. They are nonetheless not less important than those to which numbers and values can be affixed. In fact the farmer and his family are the final recipients of the gains from rural road improvement and it is the betterment of his human condition which is sought here. He may have improved or new access to medical and educational facilities and to gains and enrichment which derive from additional contact to new people and new ideas. The farmers commercial links will thus be improved and in some cases better access to processing facilities (agro-industrial) will be afforded. These benefits may be relatively constant over the roads, The methodology requires the inclusion of whether the socio-economic benefits due to road improvement are expected to be average or above average in which case a short qualifying statement would be included.

ii) The internal rate of return is derived from the algebraic sum of the present values of the annual benefits (net value of incremental crop production, vehicle operating costs savings and maintenance cost savings (positive or negative) as compared to the present value of construction costs to determine the probable return on investment.

d) Penetration Roads

The benefits from the improvement of penetration do not require that vehicle operating cost savings be considered since present traffic is either extremely low or non-existent. The net income from incremental crop production will be the single most important gain from road construction. Benefits from the construction of penetration roads are a much greater uncertainty than those of minor feeder roads since preliminary analysis of the potential for agricultural production of the influence area of the road including the availability of people and their eventual settlement, fertile land, suitable climate, marketing channels and other essential factors must be demonstrated. The results should therefore be viewed accordingly. Again, the benefits from road improvement will be:

- incremental marketable crop production leading to increased net income to small farmers.
- The enrichment in the quality of life in rural areas (social benefits) and other socio-economic effects.
- road maintenance costs differences (negative)

The costs incurred in the improvement of minor feeder roads are:

- construction costs

There are two ways of handling the evaluation of penetration roads. The first is the method used above for minor feeder roads and is much simpler than that of minor feeder roads since vehicle operating costs savings do not exist. Since little or no maintenance costs are incurred before construction, the maintenance costs after construction are a cost to the sub-project and should be considered in the analysis. In order to be consistent with the minor feeder road methodology, maintenance costs for penetration roads are negative benefits and not positive costs. In other respects the analysis is identical with that of minor feeder roads.

Where penetration roads are all integral part of a sub-project or part of an integrated development scheme, a package approach is used. The costs of construction should be treated as any other input cost and the internal rate of return estimated for the entire sub-project. Assuming that the returns of all of the factor inputs is proportional to their costs, then the IRR for the penetration road would be identical with the total project or scheme IRR.

The criteria for evaluating the eligibility of financing the construction of penetration roads is the same as for major feeder roads, i.e., a minimum IRR of 15% and a consideration of socio-economic effects.

5. The Eligibility of roads for improvement or construction

A principal criterion for evaluating the eligibility of rural roads for improvement is an IRR of 15% or more on investment which is the currently accepted opportunity cost of capital in the Philippines. Also where the anticipated additional socio-economic benefits are expected to be more than average, these would be qualified. Other important factors in the influence area of the road should be identified. The discussion of benefit incidence and additional socio-economic benefits can help to clarify proper choices especially when there are marginal differences among roads in terms of IRR criteria. The IRR would be expressed as a non-fractional percentage, e.g. 15% or 17%.

ECONOMIC STUDY MODEL - ILLUSTRATIVE CASE

Introduction

The following study seeks to illustrate the application of the economic methodology described in Section II. C of the text and in Appendix XI, to a specific sub-project (hereinafter referred to as the project) selected from the Road Network Development Plan of Bulacan, a province located north of Manila. The project is a segment of the Baliwag-San Rafael-Sta. Lucia road and is shown in Charts 1 & 2. This project is considered as a high priority project by the provincial government of Bulacan.

The study illustrates the economic methodology applicable to a major feeder road as defined in Section II. C of the text. Two other illustrative cases showing the application of the economic methodology relevant for minor feeder and penetration roads are being developed by USAID and PDAP. The examples, together with this study, will be used in the training courses proposed for the PDS staff of participating PDAP provinces.

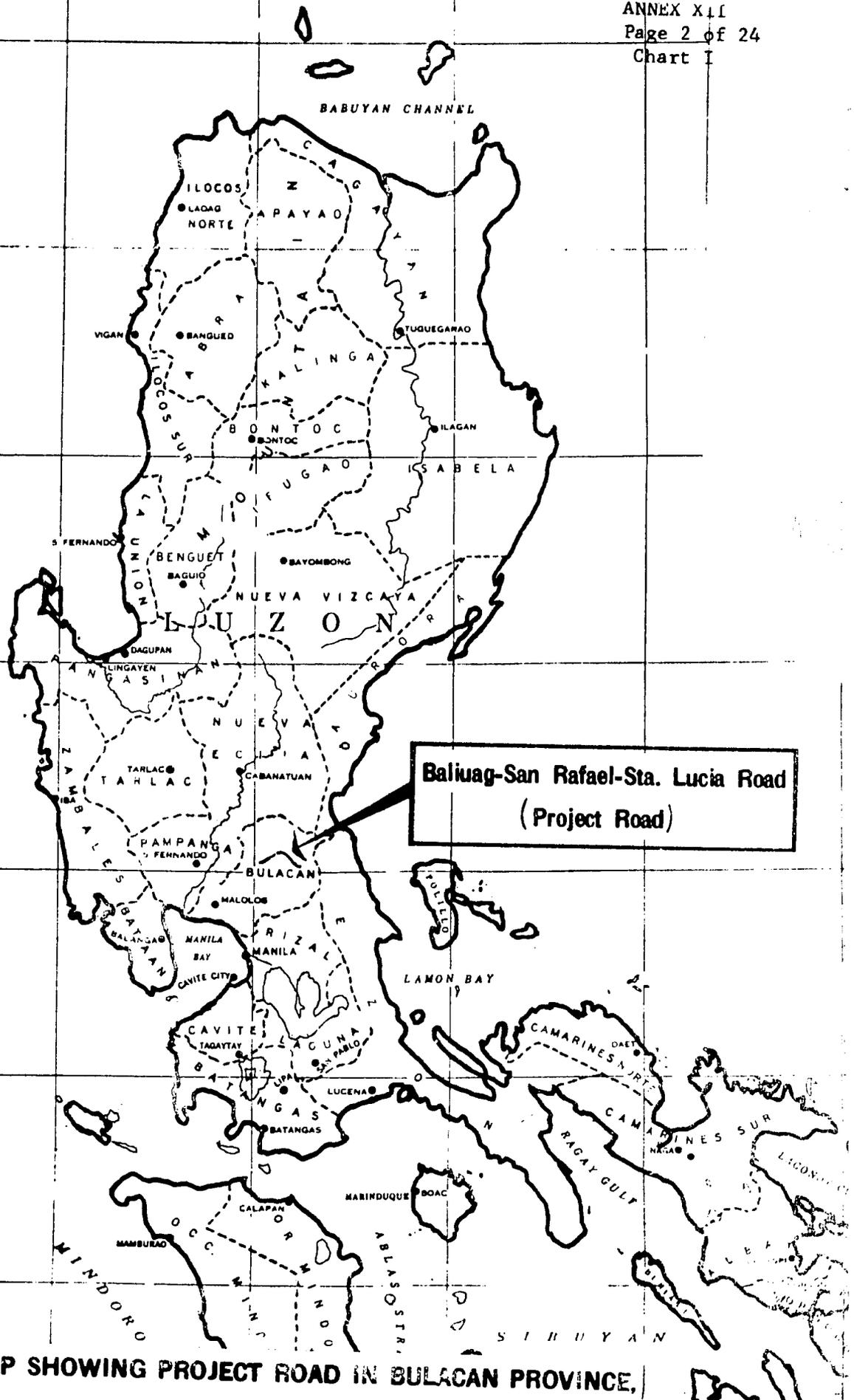
The study is merely illustrative in nature, and its results should therefore be considered as highly tentative at this time. Additional analysis using refined data will be undertaken in the future to verify the initial results of this study.

Project Description

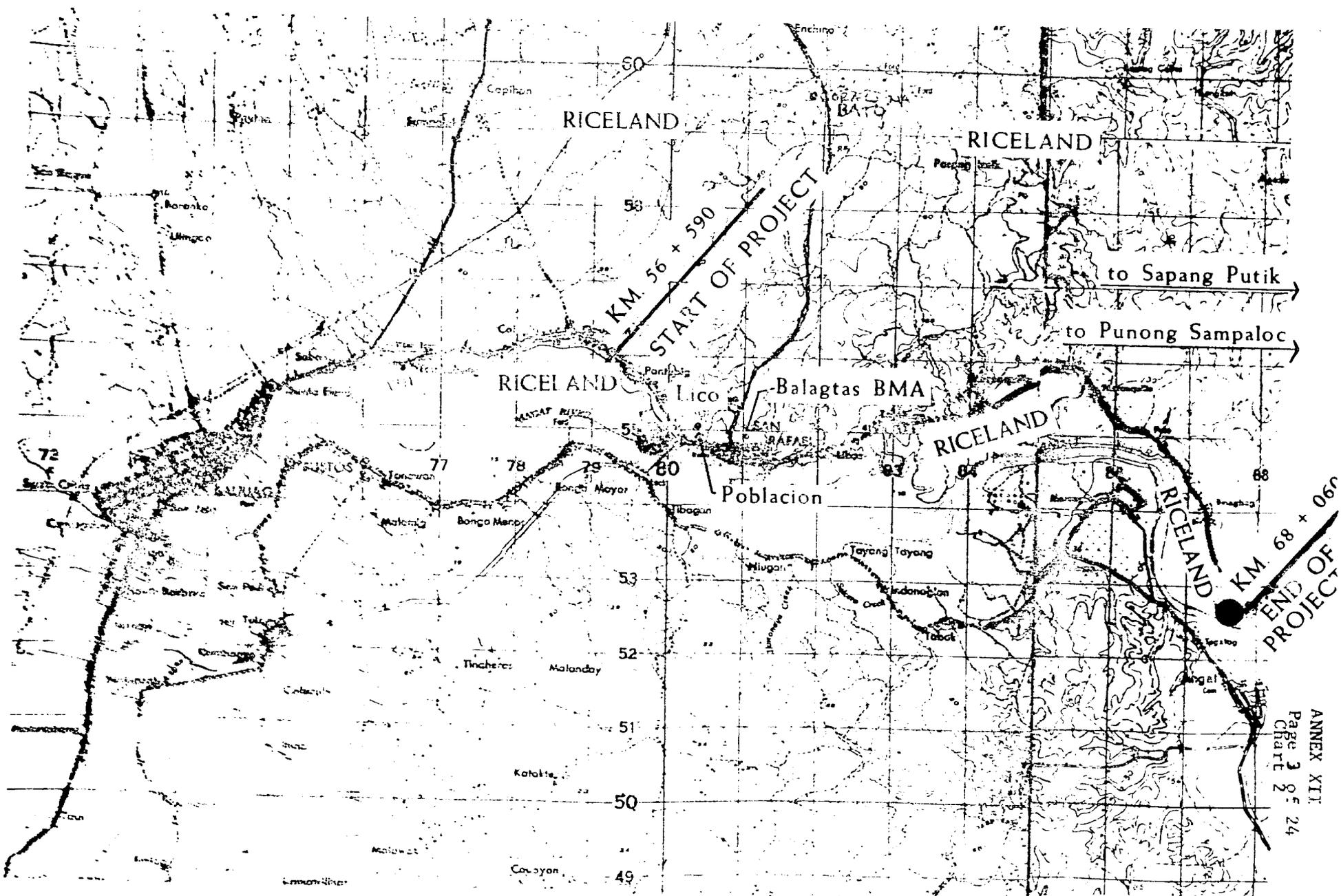
a. Existing Road Characteristics

A detailed inventory of the proposed project was recently undertaken by the Provincial Engineer's Office of Bulacan province. For the purpose of this inventory, the road was divided into a number of homogeneous subsections on the basis of roadway width, and type and condition of pavement. For each subsection, data was collected on present road condition and characteristics, degree of roadside friction, structures, terrain, major intersections, and operating speed. This inventory has formed the basis for calculating the traffic costs for the road in its existing condition.

The project starts at KM 56+590 on the Baliwag-San Rafael-Sta. Lucia Road and ends at KM 68+060, comprising a total length of 11.47 kilometers. It has for the most part a roadway width of 5.0 meters, except for short sections (totalling 1.1 kilometers) with a width of 4.0 meters. Except for a short section of 0.45 kilometers of cement concrete in the San Rafael poblacion area (KM 58+054-KM 58+500), the road's surface



**MAP SHOWING PROJECT ROAD IN BULACAN PROVINCE,
LUZON ISLAND, PHILIPPINES**



SALIUAG-SAN RAFAEL-STA. LUCIA ROAD, BULACAN PROVINCE

Sand and gravel pits

is either asphalt or gravel and is in either bad or very bad condition. The terrain is generally flat for the first 4 kilometers of the road, and becomes rolling thereafter. Road structures include a number of drainage pipes and two bridges. The first bridge (KM 61+693) is a recently constructed bailey bridge with a span length of 9.00 meters and a carriage width of 3.9 meters. The second bridge (KM 65+380) is another bailey bridge which spans a length of 33.1 meters and has a carriage width of 3.53 meters. The second bridge is currently in a bad condition.

b. Proposed Improvement Level

The initial 1.464 kilometers of the project road (KM 56+590-KM 58+054) is proposed to be upgraded to a cement concrete pavement. This section of the project road has a relatively high traffic density. Its average annual daily traffic is estimated at over 400 vehicles. The second section of the project road has a cement concrete pavement which is in good condition; no improvements are proposed for this section. The third section consists of 9.56 kilometers (KM 58+500-KM 68+060) and is proposed to be provided with a new gravel course. Present average annual daily traffic over this section is between 100-150 vehicles.

The scope of improvement also involves the widening of the roadway in certain sections; the raising of elevation of some sections and the lowering in some sections to reduce grade; the replacement of the bailey bridge at KM 61+693 with a reinforced concrete box culvert and the replacement of the bailey bridge at KM 65+380 with an RCDG.

Initial Selection Criteria

The project meets the initial selection criteria listed in pa. 3 of the text. First, the project will serve an agricultural area and will benefit mainly small farmers. While no actual survey of farms in the influence area was undertaken, it can be assumed safely that the project will serve an average of at least 10 farms of less than 3 hectares each within its influence area per kilometer of length. The available agricultural information shows that Bulacan is a province of small farms. Table 1 shows that over 75% of all farms in Bulacan has individual sizes of less than 3 hectares, while less than 1% comprises farms of 10 hectares and over. Similarly, in San Rafael and Angat municipalities (where the sub-project has its influence area), the proportion of total farms with individual sizes of less than 3 hectares is greater than 70% (70.1% in San Rafael and 79.8% in Angat). Less than 1% of all farms in San Rafael and in Angat consists of farms with individual sizes of 10 hectares and over. Second, the project does not lead to a deadend or impassable road at both ends. Third, the project

passes through the poblacion area of San Rafael municipality and connects to a road network that leads to Baliwag, a major market center in Bulacan. Fourth, the level to which the road and the road structures are proposed to be improved took into consideration the preliminary engineering criteria listed in pp. 3 of the text.

Influence Area

The influence area of the project was determined with the aid of Bureau of Coast and Geodetic maps of the area (scale 1:50,000) and aerial photos taken sometime in 1966. Most of the project's influence area lies on its northern side since the influence area is sharply delimited on the southern side by the Angat River. On the northern side, the road's influence area is circumscribed by the San Ildefonso-Acle Road and on the western side, by the national highway.

The project is a segment of a road that feeds to a national highway. The sub-project provides access to 12 barrios in the municipality of San Rafael and 5 barrios in the municipality of Angat.

Project Benefits and Benefit Incidence

The project can be classified as a major feeder road in terms of the functional classification of rural roads as discussed in Section II.C. The road carries a relatively high traffic volume and despite its existing bad condition is capable of providing year-round access to agricultural areas within its area of influence. The relation of the road to the agricultural area it serves has been analyzed, and it has been concluded that the road in its existing condition does not pose a significant constraint to increased agricultural production in the influence area.

Vehicle operating costs on the road are relatively high because of the road's generally bad condition. The major benefits expected from road improvement are user cost savings resulting from a reduction in vehicle operating costs. The road improvement may stimulate agricultural production since part of the user cost savings is expected to be passed on to farmers in the form of lower input prices or higher net prices for their agricultural output. The development benefits are believed to be small, however, and have not been quantified. Transport costs for farmers in the influence area are not a significant proportion of total production costs. A decrease in transport costs, therefore, is not likely to induce significant production increases.

The major social benefit expected from this project is easier access to health, educational, and market facilities in Baliwag, a major center in Bulacan province. The social benefits from this project will accrue mostly to small farmers in the road's influence area.

User cost savings expected from road improvement are expected to be distributed among small farmers in the influence area, traders, transport owner/operators, and construction firms (which are mostly small-sized) quarrying sand and gravel deposits in the influence area. It is quite difficult to ascertain the exact proportionate shares of the various beneficiary sectors; much of the user cost savings, however, is likely to be passed on to small farmers. The transport sector serving the influence area is dominated by small transport owners/operators and is competitive. Additionally, the road improvement is likely to attract additional transport owners/operators who are not serving the area now due to the bad road condition.

Existing Traffic

a. Traffic Counts

The demand for transport services in the project's influence area is generated by three major sources: (1) population; (2) agricultural production; and (3) sand and gravel deposits. To estimate the resulting traffic generated by these sources, two-day traffic counts were undertaken on two stations along the project. The first counting station was located at KM 57, near the start of the sub-project. The second station was located near KM 63, midway between the start and end of the project. The results are shown in Table 2. These estimates include traffic generated within the influence area only since the project road does not carry through traffic.

It is doubtful if the results of the two-day traffic counts reflect accurately the annual average daily traffic which could pass the project road. First, traffic along the road, particularly the agriculture-related component, shows considerable seasonal variation. Second, the generally bad condition of the road has adversely affected traffic levels. To evaluate the results of the traffic counts, it was necessary to use simple passenger and truck traffic models which have been empirically specified in a recent survey of feeder roads for the IBRD. The models yield results (traffic estimates) that would obtain if the road standard allowed any vehicle to pass the project road all year round.

b. Passenger Traffic

From an analysis of traffic of feeder roads not carrying through traffic, the IBRD study found that an average of 50 passenger trips (both ways) were generated for every 1,000 persons living in the influence area.

$$(1.1) \quad \text{Passenger trips} = \sum_{x=1}^n B_x \cdot 0.056$$

where B_x - Population of barrio X included in the influence area. To

convert passenger trips into passenger-kilometers, the barrio population was multiplied by the distance of the barrio from the start of the road project. Thus,

$$(1.2) \quad \text{Passenger-kms} = \sum_{x=1}^n B_x L_x \cdot 0.056$$

where L_x = distance (in kms.) of barrio x from the start of the road project.

The barrios in the project's influence area, their respective populations in 1974 and distances from the start of the project, are shown in Table 3. The following compares results of applying equation (1.1) to project data with traffic count results.

	<u>Average Daily Passenger Trips Generated, 1974</u>	<u>% of Population 1974</u>
Model Estimates	1061	5.6
Traffic Count Estimates		
Sept. 7, 1974	1416	7.5
Sept. 9, 1974	1668	8.8

The traffic count estimates yield higher estimates than those of the model. They also appear to show some degree of stability which is probably indicative of a lack of a strong seasonal variation in passenger traffic. The project provides access to educational and market facilities in Baliwag for barrios in the influence area, and this factor is a strong and regular component in passenger traffic on the road. In passenger traffic projections, the parameter 0.082 instead of 0.056 will be used.

c. Truck Traffic (Generated by Agriculture and Population)

The truck trip model as formulated in a recent study of feeder roads referred to above relates the number of daily truck trips to the population and agricultural production in the influence area. The model's estimates include only truck trips generated by a road's influence area, and excludes through traffic. The model as specified is as follows.

$$(1.3) \quad \text{Truck trips} = \frac{.002 \cdot \text{Population} + \text{Agricultural Production (by road)}}{300}$$

$$(1.4) \quad \text{Truck-kms} = \text{Truck trips} \times \frac{\text{Road Length}}{2}$$

The study established empirically that for every 1,000 people in a road's influence area, 2 truck trips are generated, while for every 300 tons of agricultural production, 1 truck trip is generated. The model is admittedly crude since first, marketable surplus not total agricultural production is the relevant variable and second, this approach does not

include truck-trips generated by other economic activities such as fishing, mining, industry, etc.

In estimating current truck traffic on the basis of the model, agricultural production in the influence area was first calculated. This calculation was not done directly for lack of sufficient information on land use and capability in the influence area. An indirect method was used instead. This method involves estimating the per capita (i.e. per head of farm population) agricultural production in the influence area and multiplying it by an estimate of farm population in the same area. The most recent Agriculture Census (1971) provides an estimate of per capita agricultural production for San Rafael municipality where most of the project's influence area lies. (The most disaggregative level of agriculture census data is the municipality level). This estimate for San Rafael was adopted for the influence area, and was projected up to 1974 on the basis of the historical annual growth rate between 1960 and 1971. An estimate of farm population in the influence area in 1971 was derived by multiplying the proportion of farm population to total population in San Rafael by the estimated population in the influence area. The result (farm population in the influence area in 1971) was then projected on the basis of the farm population growth for San Rafael between 1960 and 1971.

Tables 4 and 5 show the agricultural production and farm population in San Rafael for the census years July, 1959-June 1960 and July, 1970-June 1, 1971, and in the influence area for 1970-1974.

A comparison of model estimates using project data with traffic count estimates is shown below. The data indicate that truck traffic shows considerable seasonal fluctuations, and it is likely that the traffic count estimates are at the lower range of these fluctuations since the counts were taken during the agricultural slack season. The peak times for agricultural activity in the area are the harvest months, usually April-May and October-November .

Average Annual Daily Truck Trips, 1974

Model Estimates	69
Traffic count estimates	
Sept. 7, 1974	53
Sept. 9, 1974	26

d. Truck Traffic (Sand and Gravel)

The sand and gravel deposits found within the influence area along the banks of Angat River generate a substantial amount of traffic on the project road. These deposits are quarried by private construction

companies and transported to the Greater Manila area or used within Bulacan province itself. The province of Bulacan is the major supplier of sand and gravel to the Greater Manila area. Table 6 shows estimates of sand and gravel quarried from various pits in Bulacan from FY 1966-FY 1973.

The sand and gravel traffic that uses the project road is generated by the Pantubig (San Rafael municipality) and Sta. Lucia (Angat municipality) pits in the influence area. These pits are shown in Chart No. 1. On the basis of interviews with local people, it has been established that during recent years, about 67% of the total sand and gravel hauled from San Rafael came from the Pantubig pit which is over a kilometer away from the start of the project road. The 67% share or almost 36 thousand cubic meters annually is equivalent to 117 truck trips daily (1 truck = 4 cubic meters). It is further estimated that about 70% of these trips (or 81 trips) passes through 1.3 kilometers of the project road daily, generating an annual average daily traffic of 105 truck-kms.

The current proportion of total sand and gravel from Angat municipality that comes from the Sta. Lucia pit cannot be determined. Due to the very poor condition of the project road, particularly the bailey bridge at KM 65 + 380, the volume of sand and gravel quarried from the Sta. Lucia pit has probably declined in recent years and is small at present. The Sta. Lucia pit, however, possesses deposits much more substantial than those in competing pits nearer Manila. The improvement of the project road will reduce transport costs for private construction companies, and will have the positive impact of opening the Sta. Lucia pit to further exploitation. It is assumed that about 42 annual average daily truck trips (equivalent to 482 truck-kms) can be generated.

Traffic Projections

To provide a basis for calculating annual benefits over the project lifetime, traffic projections have been prepared for each major source of traffic demand. The projections are shown in Table 7.

a. Population

The populations in the barrios within the influence area have been projected to continue to grow at their respective intercensal (1960 and 1970) annual growth rates. The projected populations of the barrios in the influence area are shown in Table 8. The projected barrio populations were converted into annual average daily passenger-kilometers using the following equation:

$$\text{Annual Average Daily Passenger-Kms. (for all barrios)} = \sum_{X=1}^9 B_x \cdot L_x \cdot 0.082$$

where B_x = projected population of barrio X included in the influence area; and

L_x = distance (in kms.) of barrio X from the start of the road project.

b. Agriculture

Agricultural production in the influence area was assumed to grow at an annual average rate of 6.8 percent, a combined result of a projected 1.8 percent annual increase in farm population and a 5.0 percent annual increase in per capita agricultural production. The projected increases in farm population and in per capita agricultural production continue the historical trend during the period 1960-71. Much scope exists for increasing productivity in the influence area particularly if irrigation coverage is expanded. The 1971 census data show that palay yields in San Rafael municipality (where most of the road's influence area is located) average only about 48 cavans/hectare (2.1 MT/ha). The same data show that only about 9 percent of total farm area in San Rafael municipality is irrigated. Additionally, some scope also exists for increasing hectareage particularly in the northeastern fringes of the road's influence area.

The projected agricultural production (and population) was then converted into truck-kms. using the following equation.

$$\text{Annual Average Daily Truck - Kms.} = .002 \sum_{x=1}^n B_x + \frac{\text{Agricultural production (by road)}}{300} \times \frac{11.47 \text{ kms}}{2}$$

c. Sand and Gravel Traffic

No realistic basis exists at this time for making traffic projections generated by sand and gravel deposits in the influence area. For the purpose of this study, it is conservatively assumed that an annual average daily volume of 244 cubic meters will be quarried from pits within the influence area, and will generate about 123 truck trips or 586 truck-kms.

Traffic Costs

Vehicle operating costs over the project road in its present and projected (improved) condition were determined on the basis of traffic costs that have been calculated in the recent study of feeder roads referred to above. These costs are expressed on a passenger-kilometer and truck-kilometer basis, and are shown in Tables 9-10. The traffic costs shown in these tables are net of taxes, and hence can be regarded as economic costs.

As can be observed from Table 9 traffic costs are expressed in terms of a homogeneous unit, i.e., passenger-kilometer, instead of being disaggregated by major means of passenger transport (cars, jeepneys, buses). This was done because the proportion of cars, jeepneys, and buses in the various feeder roads studied has been observed to be highly dependent on existing road conditions. The traffic costs per passenger-kilometer have been derived through a weighting system reflecting the average

passenger vehicle composition on feeder roads.

It is realized that the adoption of traffic costs shown in Table 9 as parameters for this study assumes some homogeneity between the project road and the feeder roads for which the cost parameters were developed. This assumption will have to be checked in the future.

The benefits of improving a road/readily apparent from Tables 9-10. For example, upgrading a gravel road which is in bad condition and on which the operating speed is 20 KPH to a paved road with an operating speed of 60 KPH will realize a cost saving of 2.5 centavos per pass.-km. and 52 centavos per truck-km.

a. Traffic costs before improvement

Calculations of traffic costs incurred on the project road in its existing condition are shown in Table 11. The project road was divided into homogeneous sections and traffic costs for each section were determined. These were then multiplied by the relative lengths of all sections to derive the average traffic costs over the project. The calculations show that ₱0.048 per pass.-km and ₱0.93 per truck-km are incurred over the project road in its existing condition.

b. Traffic costs after improvement

Calculations of traffic costs to be incurred on the project road after improvement are shown in Table 12, using the same procedure adopted in (a) above. The calculations show that ₱0.03 per pass.-km and ₱0.55 per truck-km will be incurred over the project road after improvement.

c. Unit benefits from improvement

The benefits to be derived from the improvement of the project road are the reduction in vehicle operating costs. These are simply the difference between traffic costs before and after improvement and are shown below.

<u>Benefits per</u>	<u>(Centavos)</u>
Pass-Km	1.8
Truck-Km	38

Project Benefits

The projected annual benefits from the improvement of the project road are shown in Table 15. The benefit stream consists of annual user cost savings, annual maintenance cost savings, and the salvage or remaining utility values of the major road structures. The annual user cost saving

were derived by multiplying the projected annual average daily passenger-kms. and truck-kms. by 365 days and by unit cost savings. The annual maintenance cost savings were derived as the difference in the annual maintenance cost of the road in its existing versus its improved condition (see Table 14). The annual maintenance cost savings have been assumed constant over the projection period. The present values of the salvage or remaining utility values of the cement concrete portion of the road, the reinforced concrete box culvert, and the RCDG bridge, beyond the 10th year have been expressed as a benefit during the initial or construction year.

Project Costs

The improvement costs of the project road are shown in detail in Table 13. The cost data are net of taxes, and hence can be thought of as approximate measures of the project's economic costs. Due to lack of sufficiently detailed information, shadow pricing of the unskilled labor component of the project has not been undertaken. As a result of this lack of adjustment, project costs shown in Tables 13 and 14 are overestimated, but probably not significantly as to seriously affect the outcome of the analysis. (Very rough calculations show that project costs shown in Table 13 are overestimated by around 3 percent). Nonetheless, the refinement of this study will have to consider shadow pricing the unskilled labor component.

Benefit Cost Ratio and Internal Rate of Return

The present values of the project's benefits and costs have been evaluated using a discount rate of 15 percent, an approximate measure of the opportunity cost of capital in the Philippine economy. At this discount rate, the benefit-cost ratio is about 1.0. The internal rate of return is approximately 15 percent. The project meets the minimum economic criteria, and hence can be considered tentatively as economically feasible.

Table 1

Size Distribution of Farms in Bulacan Province and in
San Rafael and Angat Municipalities, April 1971*

Size of Farm (in hectares)	Bulacan		San Rafael		Angat	
	No. of Farms	%	No. of Farms	%	No. of Farms	%
All Farms	28,675	100.0	2,299	100.0	1,204	100.0
Under 1.0	3,232	11.3	168	7.3	132	11.0
1.0 and under 3.0	18,361	64.0	1,443	62.8	829	68.8
3.0 and under 5.0	5,587	19.5	523	22.7	212	17.6
5.0 and under 10.0	1,289	4.5	159	6.9	29	2.4
10.0 and under 25.0	192	0.7	4	0.2	2	0.2
25.0 and under 50.0	12	-	2	-	-	-
50.0 and over	2	-	-	-	-	-

* Preliminary

Source of Data: 1971 Agriculture Census of the Philippines: Bulacan,
National Census and Statistics Office

Table 2

Traffic Count Estimates on Project Road
By Vehicle Type

Vehicle Type/ Counting Stations	September 7, 1974		September 9, 1974	
	KM 57+360 (7:00 a.m.- 6:00 p.m.)	KM 62+900 (8:00 a.m.- 4:00 p.m.)	KM 57+020 (7:00 a.m.- 6:00 p.m.)	KM 62+900 (8:00 a.m.- 4:00 p.m.)
Passenger Cars *	34	0	39	1
Jeepneys *	317	122	334	118
Buses *	0	0	6	3
Trucks	106	0	47	4
Animal Drawn	18	7	0	31

* Average occupancy rates:

- a) Passenger Cars - 3 passengers
- b) Jeepneys - 6.22 passengers.
- c) Buses - 45 passengers

Table 3

Estimated Population and Passenger Traffic Generated
Within the Influence Area, 1974

<u>Name of Barrio</u>	<u>Estimated ^{1/} Population (1)</u>	<u>Estimated No. of Daily Pass. ^{2/} Trips (2)</u>	<u>Distance of Barrio from Start of Sub-project (kms) (3)</u>	<u>Estimated No. of Daily Pass.-Kms ^{3/} (4)</u>
<u>Municipality of San Rafael</u>				
1. Pantubig	1616	90	1.16	104
2. Lico	914	51	1.45	74
3. Poblacion and Balagtas BMA	2014	113	2.35	266
4. Libis	772	43	3.75	161
5. Talaksan	1547	87	4.80	418
6. Maronquillo	2027	114	6.35	724
7. Pulo	1812	101	8.20	828
8. Coral na Bato	562	31	2.35	73
9. San Isidro	472	26	2.35	61
10. Pasong Callos	464	26	6.35	165
11. Pasong Bangkal	302	17	6.35	108
12. Maasim	603	34	8.20	279
<u>Municipality of Angat</u>				
1. Binagbag	2261	127	10.10	1283
2. Santa Lucia	669	37	11.60	429
3. Baybay	226	13	11.60	151
4. Pulong Sampaloc	1031	58	11.60	673
5. Sapang Putik	<u>1653</u>	<u>92</u>	<u>11.60</u>	<u>1067</u>
TOTAL	18945	1061		6864

1/ Estimated on the basis of intercensal growth rates between 1960 and 1970. See Table 8.

2/ $0.056 \times (1)$

3/ $(3) \times (2)$

Table 4

Agricultural Production and Farm Population
in San Rafael Municipality, Bulacan
1959-60 and 1970-71

	<u>1959-60</u>	<u>1970-71</u>	<u>Intercensal Annual Growth Rate (%)</u>
Agricultural Production (metric tons)	<u>5970</u>	<u>12,278</u>	<u>6.8</u>
Palay	5717	11,937	
Corn	129	144	
Stringbeans	66	135	
Others	58	62	
Total Farm Population	12,726	15,421	1.8
Agricultural Production/Farm Population	0.47	0.80	5.0
% Farm Population to Total Population	64.4	53.1	

Table 5

Estimates of Agricultural Production and Farm Population
in the Project's Influence Area, 1970-1974

	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>Average Annual Growth Rate 1970-74 (%)</u>
Agricultural Production (metric tons)	7,156	7,643	8,162	8,717	9,304	6.8
Total Farm Population	8,945	9,106	9,270	9,437	9,592	1.8
Agricultural Production/ Farm Population	.80	.84	.88	.92	.97	5.0
% Farm Population to Total Population	53.1	52.5	51.9	51.3	50.6	

Table 6

Sand and Gravel Quarried
from Bulacan, FY 1966-FY 1973
(in thousand cubic meters)

<u>Fiscal Year</u>	<u>Total Bulacan</u>	<u>San Rafael</u>	<u>% of Total</u>	<u>Angat</u>	<u>% of Total</u>
1965-66	513	-	-	3	0.6
1966-67	603	24	4.0	-	-
1967-68	891	178	20.0	14	1.6
1968-69	1,002	117	11.7	32	3.2
1969-70	1,516	327	21.6	29	1.9
1970-71	993	100	10.0	3	0.3
1971-72	976	160	16.4	-	-
1972-73	918	124	13.5	12	1.3

Source: Provincial Development Staff, Bulacan

Table 7

Traffic Projections for the Project Road

Year	Annual Average <u>1/</u> Daily Pass-Kms.	Population in the Influence Area	Annual Agricultural Production (metric tons)	Annual Average Daily Truck-Kms. <u>2/</u> (Agriculture and Population-Related)	Sand and Gravel <u>3/</u> Quarried Daily (cu.m.)	Annual Average <u>4/</u> Daily Truck-Kms (Sand and Gravel Related)
1975	10,329	19,516	9,955	413	244	586
1976	10,654	20,105	10,627	430	244	586
1977	10,947	20,717	11,320	453	244	586
1978	11,290	21,354	12,135	476	244	586
1979	11,605	22,015	12,977	499	244	586
1980	11,970	22,697	13,845	522	244	586
1981	12,336	23,404	14,847	550	244	586
1982	12,692	24,141	15,880	579	244	586
1983	13,115	24,905	16,945	608	244	586
1984	13,508	25,697	18,042	637	244	586
1985	13,950	26,520	19,289	671	244	586

1/ Computed using the ff. equation:

$$\text{Annual Average Daily Pass-Kms.} = \sum_{X=1}^N B_x \cdot L_x \cdot 0.082$$

Where B_x = projected population of barrio x included in the influence area (see Table 8);
 L_x = distance (in kms.) of barrio x from start of the road project (see Table 3).

2/ Computed using the ff. equation:

$$\text{Annual Average Daily Truck-Kms.} = .002 \sum_{X=1}^N B_x + \frac{\text{Annual Agricultural production} \times 11.47 \text{ kms.}}{300 \times 2}$$

$\sum_{X=1}^N B_x$ is column 2 of Table 7 while agricultural production is shown as Column 3.

3/ Assumes that 160 cu.m. daily will be quarried from the Pantubig pit (1.3 kms away from the start of the project) while 84 cu.m. daily will be quarried from the Sta. Lucia pit (11.47 kms. away from the start of the project).

4/ Derived as follows:

$$2 \left[\frac{160 \text{ cu. m.}}{4 \text{ cu.m./truck}} \cdot 1.3 \text{ kms.} + \frac{84 \text{ cu.m.}}{4 \text{ cu.m./truck}} \cdot 11.47 \text{ kms.} \right]$$

Table 8

Present and Projected Population in the Road Influence Area

Name of Barrio	Intercensal		1971	1972	1973	1974	1975	1976	1977	1978	
	1960	1970									Growth Rate (%)
Municipality of San Rafael											
1. Pantubig	1,054	1,430	3.11	1,474	1,520	1,568	1,616	1,667	1,718	1,772	1,827
2. Lico	709	850	1.83	866	881	898	914	931	948	965	983
3. Poblacion)	1,331	1,789	3.00	1,843	1,898	1,955	2,014	2,074	2,136	2,200	2,266
4. Balagtas (BMA)											
5. Libis	557	703	2.37	720	737	754	772	790	809	828	848
6. Talaksan	1,159	1,425	2.07	1,454	1,485	1,515	1,547	1,579	1,611	1,645	1,679
7. Maronquillo	1,458	1,845	2.38	1,889	1,934	1,980	2,027	2,075	2,125	2,175	2,227
8. Pulo	1,245	1,628	2.71	1,672	1,717	1,764	1,812	1,861	1,911	1,963	2,016
9. Coral na Bato	215	427	7.10	457	490	525	562	602	644	690	739
10. San Isidro	256	396	4.48	414	432	452	472	493	515	538	562
11. Pasong Callos	175	351	7.20	376	403	432	464	497	533	571	612
12. Pasong Bangkal	125	235	6.51	250	266	284	302	322	343	365	389
13. Maasim	530	581	0.92	586	592	597	603	608	614	619	625
Total	8,814	11,660		12,001	13,883	12,724	13,105	13,499	13,907	14,331	14,773
Municipality of Angat											
1. Binagbag	1,558	2,033	2.69	2,088	2,144	2,202	2,261	2,322	2,384	2,448	2,514
2. Santa Lucia	336	548	5.10	576	605	636	669	703	738	776	816
3. Baybay	137	196	3.63	203	210	218	226	234	243	252	261
4. Pulong Sampaloc	711	927	2.69	952	978	1,004	1,031	1,059	1,087	1,116	1,146
5. Sapang Putik	1,128	1,481	2.78	1,522	1,564	1,608	1,653	1,699	1,746	1,794	1,844
Total	3,870	5,185		5,341	5,501	5,668	5,840	6,017	6,198	6,386	6,581
Total Population in Influence Area	12,684	16,845		17,342	17,856	18,392	18,945	19,516	20,105	20,717	21,354
Source of Data:	1960 and 1970 data are from the <u>1960 and 1970 Population Censuses</u> , National Census and Statistics Office										

Continuation - Table 8

<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>
1,884	1,942	2,003	2,065	2,129	2,196	2,264
1,001	1,019	1,038	1,057	1,076	1,096	1,116
2,334	2,404	2,476	2,551	2,627	2,706	2,787
868	889	910	931	953	976	999
1,714	1,749	1,785	1,822	1,860	1,898	1,938
2,280	2,334	2,390	2,447	2,505	2,565	2,626
2,071	2,127	2,185	2,244	2,305	2,367	2,431
792	848	908	972	1,042	1,116	1,195
587	614	641	670	700	731	764
656	703	754	808	867	929	996
415	442	470	501	534	568	605
<u>631</u>	<u>637</u>	<u>642</u>	<u>648</u>	<u>654</u>	<u>660</u>	<u>667</u>
15,233	15,708	16,202	16,716	17,252	17,808	18,388
2,582	2,651	2,722	2,796	2,871	2,948	3,027
857	901	947	995	1,046	1,100	1,156
270	280	290	301	312	323	335
1,177	1,209	1,241	1,275	1,309	1,344	1,380
<u>1,896</u>	<u>1,948</u>	<u>2,002</u>	<u>2,058</u>	<u>2,115</u>	<u>2,174</u>	<u>2,234</u>
6,782	6,989	7,202	7,425	7,653	7,889	8,132
22,015	22,697	23,404	24,141	24,905	25,697	26,520

Table 9

Traffic Costs in Centavos Per Passenger Km

Condition/Type of Surface	Speed, Km / Hr.					
	20	30	40	50	60	70
Good/Paved	3.6	3.0	2.7	2.6	2.5	2.3
Good/Gravel	4.0	3.4	3.1	3.0	2.9	2.7
Fair/Paved	4.1	3.5	3.2	3.1	3.0	2.8
Fair/Gravel	4.3	3.7	3.4	3.3	3.2	3.0
Bad/Paved	4.5	3.9	3.6	3.5	3.4	3.2
Very Bad/Paved)						
Bad/Gravel)	5.0	4.4	4.1	4.0	3.9	3.7
Very Bad/Gravel	5.6	5.0	4.7	4.6	4.5	4.3

Source: Road Feasibility Studies II
Reconnaissance Report, Text Volume, May, 1974, p. 41.

Table 10

Traffic Costs in Centavos Per Truck Km

Condition/Type of Surface	Speed, Km / Hr.				
	20	30	40	50	60
Good/Paved	65	56	50	48	46
Good/Gravel	74	64	60	56	54
Fair/Paved	76	66	62	58	56
Fair/Gravel	83	74	68	66	64
Bad/Paved	86	77	72	69	67
Very Bad/Paved					
Bad/Gravel	98	88	83	80	78
Very Bad/Gravel	112	102	97	94	92

Source: Road Feasibility Studies II
Reconnaissance Report, Text Volume, May, 1974, p. 42.

Table 11

Traffic Costs Over Project Road Before Improvement

<u>Section</u>	<u>Length (Kms.)</u>	<u>Type of Surface</u>	<u>Condition of Surface</u>	<u>Operating Speed</u>	<u>Traffic Costs (Per Pass-Kms)</u>	<u>(Centavos) Per Truck-Km</u>
KM 56 + 595 - 58 + 054	1.464	Asphalt	Bad	20	4.5	86
KM 58 + 054 - 58 + 500	0.446	Cement	Good	40	2.7	65
KM 58 + 500 - 62 + 260	3.76	Asphalt	Bad	20	4.5	86
KM 62 + 260 - 66 + 460	4.20	Gravel	Bad	20	5.0	98
KM 66 + 460 - 68 + 060	1.60	Gravel	Very Bad	15	<u>5.6</u>	<u>112</u>
				Average	4.8	93

Table 12

Traffic Costs Over Project Road After Improvement

<u>Section</u>	<u>Length (Kms.)</u>	<u>Type of Surface</u>	<u>Condition of Surface</u>	<u>Operating Speed</u>	<u>Traffic Costs Per Pass-Km</u>	<u>(Centavos) Per Truck-Km</u>
KM 56 + 590 - 58 + 500	1.910	Cement	Good	40	2.7	50
KM 58 + 500 - 68 + 060	9.560	Gravel	Good	50	<u>3.0</u>	<u>56</u>
				Average	3.0	55

Table 13

Project Road Improvement Costs ^{1/}

<u>ITEM</u>	<u>UNIT</u>	<u>UNIT COST</u> (Pesos)	<u>QUANTITY</u>	<u>AMOUNT</u> (in thousand pesos)
<u>Road Improvement Cost</u>				
<u>PCCP Section: KM 56 + 590 - KM 58 + 054</u>				<u>384.5</u>
Clearing and Grubbing	Ha.	2,752	.307	0.8
Repreparation of Previously Constructed Road	Km.	4,128	1,464	6.0
Aggregate Sub-base	Cu.M.	23	2,847	65.5
Aggregate Base Course	Cu.M.	25.50	1,708	43.6
Portland Cement Concrete Pavement	Sq.M.	36.12	7,320	264.4
Overhead				4.2
<u>ABC Section: KM 58 + 500 - KM 68 +060</u>				<u>816.2</u>
Clearing and Grubbing	Ha.	2,752	2,677	7.4
Repreparation of Previously Constructed Road	Km.	4,128	9,560	39.5
Aggregate Sub-base	Cu.M.	23	18,589	427.5
Aggregate Base Course	Cu.M.	25.50	11,153	284.4
Reinforced Concrete Box Culvert	-	-	-	30.0
Overhead	-	-	-	27.4
<u>Bridge Improvement Cost ^{2/}</u>				<u>337.6</u>
Removal of Bridge Roadway and Drainage Excavation	L.S.	5,745.00	A11	5.7
Borrow	Cu.M.	5.22	60	0.3
R.C. Piling	Cu.M.	7.20	660	4.8
R.C. Test Pile	LM	318.48	360	114.6
Concrete Railing	Each	9,000.00	1	9.0
Concrete Class "A"	L.M.	136.00	54	7.3
Concrete Class "Y"	Cu.M.	475.60	12.4	34.4
Reinforcing Steel	Cu.M.	472.50	34.2	16.2
Structural Steel	Kilos	468.00	10,093	47.2
Prestressed T-Guider	Kilos	10.80	470	5.1
Riprap and Grouted	Pcs.	10,371.00	8	83.0
Bituminous Concrete Surface	Cu.M.	85.50	50	4.3
Miscellaneous	M.T.	76.80	12.1	0.9
Overhead	-	-	-	1.0
				3.8
<u>Total Improvement Cost</u>				<u>1,538.3</u>

^{1/} Financial cost net of taxes but unadjusted for the shadow price of unskilled labor.

^{2/} Existing bridge at KM 65+380.

Table 14

**Maintenance Cost for Project Road
Existing Vs. Improved Condition**

<u>Section</u>	<u>Length (Kms.)</u>	<u>Unit Maintenance (Pesos)</u>	<u>Total Maintenance (Pesos)</u>
<u>Existing Condition</u>			
PCCP	.45	1,657	746
Asphalt	5.22	8,668	45,247
Gravel	5.80	2,233	<u>12,951</u>
		Total	<u>58,944</u>
<u>Improved Condition</u>			
PCCP	1.91	1,657	3,165
Gravel	9.56	1,718	<u>16,424</u>
		Total	<u>19,589</u>
Annual Maintenance Cost Saving			<u>39,355</u>

Table 15

IRR Calculations for Project Road
(in thousand pesos)

YEAR	PROJECTED BENEFITS				PROJECTED COSTS		
	Cost Savings, Passenger Traffic	Cost Savings, (Population and Agriculture-Related)	Truck Traffic (Sand and Gravel- Related)	Maintenance Cost Savings	Total Benefits	Improvement Costs	Total Costs
1975	-	-	-	-	165*	1,538	1,538
1976	70	60	81	39	250	-	-
1977	72	63	81	39	255	-	-
1978	74	66	81	39	260	-	-
1979	76	69	81	39	265	-	-
1980	79	72	81	39	271	-	-
1981	81	76	81	39	277	-	-
1982	83	80	81	39	283	-	-
1983	86	84	81	39	290	-	-
1984	89	88	81	39	297	-	-
1985	92	93	81	39	305	-	-

Present Value: 14% discount rate 1,570
 15% discount rate 1,514

Benefit Cost Ratio (15% discount rate): 1.0
 Internal rate of return: 14.6%

*Sum of the present values of the salvage or/remaining utility values of the project components whose lifetimes exceed 10 years. The cement concrete portion (KM 56+590-KM 58+054) is assumed to have a lifetime of 20 years. The concrete box culvert (KM 61+693) and the RCDDG bridge (KM 65+380) are assumed to have lifetimes of 30 years. The calculations of the salvage or/remaining utility values are shown below:

24% x P384 (improvement cost of concrete portion)	-	92
20% x P337 (RCDDG bridge)	-	67
20% x P 30 (box culvert)	-	6
		<u>165</u>

ILLUSTRATIVE CASE II

The following study seeks to illustrate the application of the methodology described in the Capital Assistance Paper on Rural Roads in the Philippines (Section II C of the text and in Appendix VI) relative to low traffic minor feeder roads and penetration roads. For such roads the main benefit to be derived from improvement or construction would be stimulated agricultural production. Present traffic is very low or nonexistent over parts of the road segment under study. Part of the marketable production is carried by carabao (water buffalo) sled. Inhabitants and those providing social services, such as teachers, to the area of influence of the road, have been observed to walk long distances because of the lack of all weather passage and transport facilities. Savings in transport costs (road user savings) are assumed to be negligible for the purpose of this study.

The methodology for low traffic minor feeder roads and penetration roads is identical to that of the major feeder road in Case I except that the major benefit here to road improvement is net income to small farmers from induced agricultural production and not the transport cost savings of Case I.

In order to obtain the internal rate of return of the road, the algebraic sum of the present values of the annual net income stream from induced agricultural production due to road improvement and annual road maintenance cost differences are compared with the present value of construction costs to determine the probable return on investment. Where roads are a part of an overall project without which the project would not be feasible then a package approach to determining the return on investment could be used. This latter case will not be demonstrated here.

Data does not now exist in forms which would make possible a precise and thorough analysis of the effects of agricultural production from improvement of the road selected for study. However, the required data can be compiled and generated with the cooperation of the Provincial Development Assistance Project (PDAP) Staff which is expected to be part of the Department of Local Government and Community Development in Manila and the Provincial Development Staffs (PDS) in the provinces. Brief tentative lists of the data requirements from the PDAP Staff and for the PDS for the economic analysis are included in a separate paper on the training of Provincial Development Staff.

The study is illustrative in nature. The results are tentative and should not be used directly to determine the feasibility of road improvement. Additional data and analysis would be necessary to verify the results of this study.

It was decided to root this study in a real situation rather than use a fictitious case in order to experience the nature and reliability of the existing data and research aids which would be available to a Provincial Development Staff.

Project Description

The road under study is a segment of a provincial road located in the Municipality of El Salvador in the Province of Misamis Oriental. The provincial road extends from the national road at the poblacion of El Salvador southwest through the length of the Municipality. It is the main access route through the Municipality connecting remoter parts to the national road system. The road segment under study is approximately 8.5 kilometers long and extends from the Lourdes Turnoff to Delayap as shown on the accompanying map. The road is the major link for the barrios of Hinigdaan and Kalungunan to the main road network.

This road is considered by the PDS to be the third priority road for the Province of Misamis Oriental in the proposed rural road project. It has been selected for study here because it basically serves only one municipality thereby simplifying the case study.

Economy

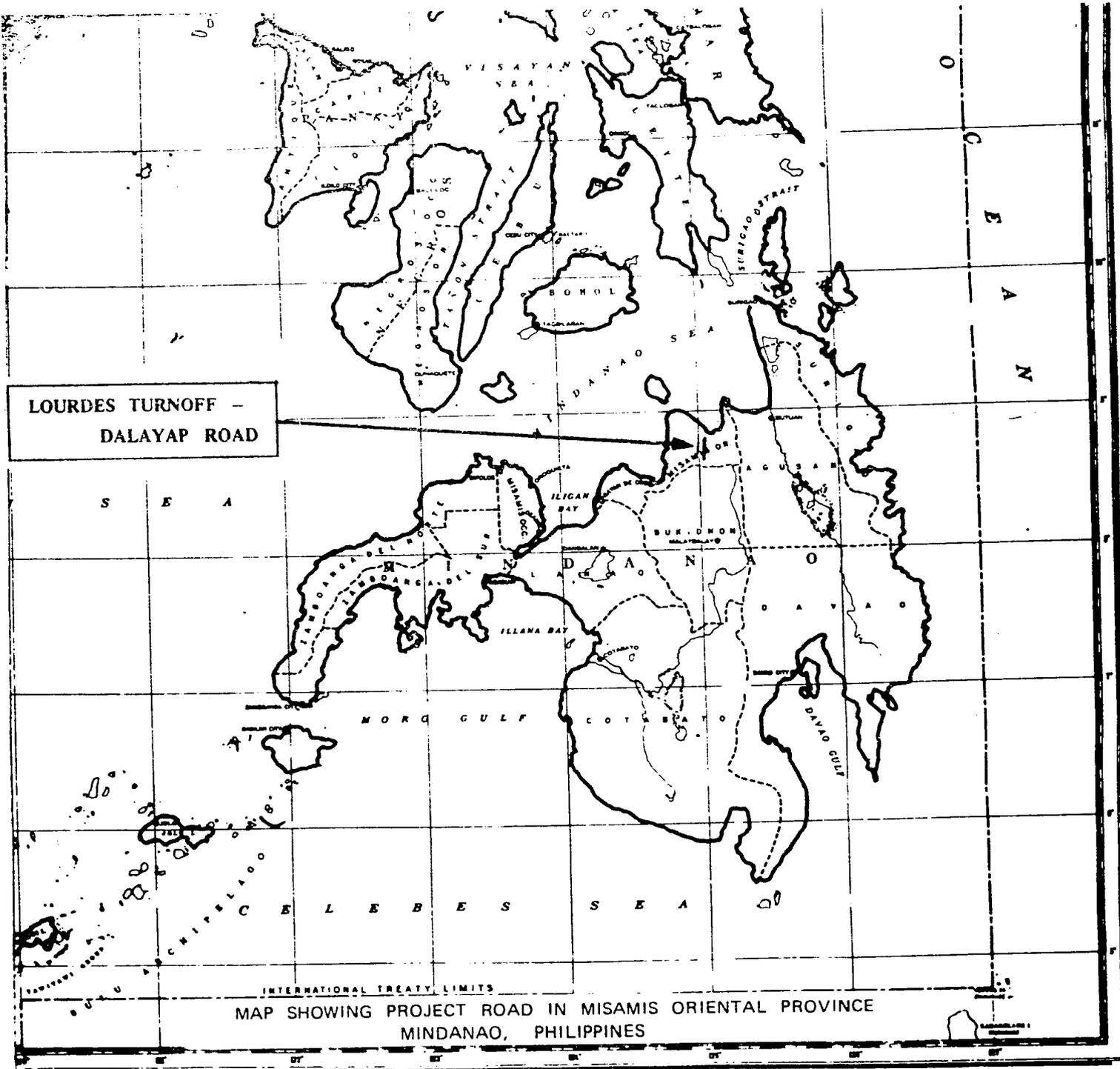
The economy of the Municipality of El Salvador is based on agriculture. The most important crop is copra which is cultivated mainly in areas closer to the coast. Copra is not an important crop in the area of influence of the road segment under study. Corn is the next crop in municipal importance and the chief crop in the area of influence of this study. Corn production in the Municipality of El Salvador in 1971 accounted for more than one half of provincial production. Other crops are lowland and upland rice, tobacco, peanuts, root crops and vegetables. All but lowland rice are grown in the area of influence of the road.

A plant for processing sorghum into animal feed for export is now being established near the beginning of this road segment. An output of an estimated 200 Tons/Day of finished product is expected at plant capacity. The plant would require about 200 to 250 hectares of sorghum harvested three times per year. Most of the initial production will rely on factory managed farms. The relative merits of sorghum cultivation are not known at present in the municipality. For the sake of this study, it is assumed that small farmers will generally continue to produce their traditional crops. If they decide to diversify to sorghum then it is assumed that the new crop is more profitable than the former and in which event road construction would be more attractive.

The Existing Road

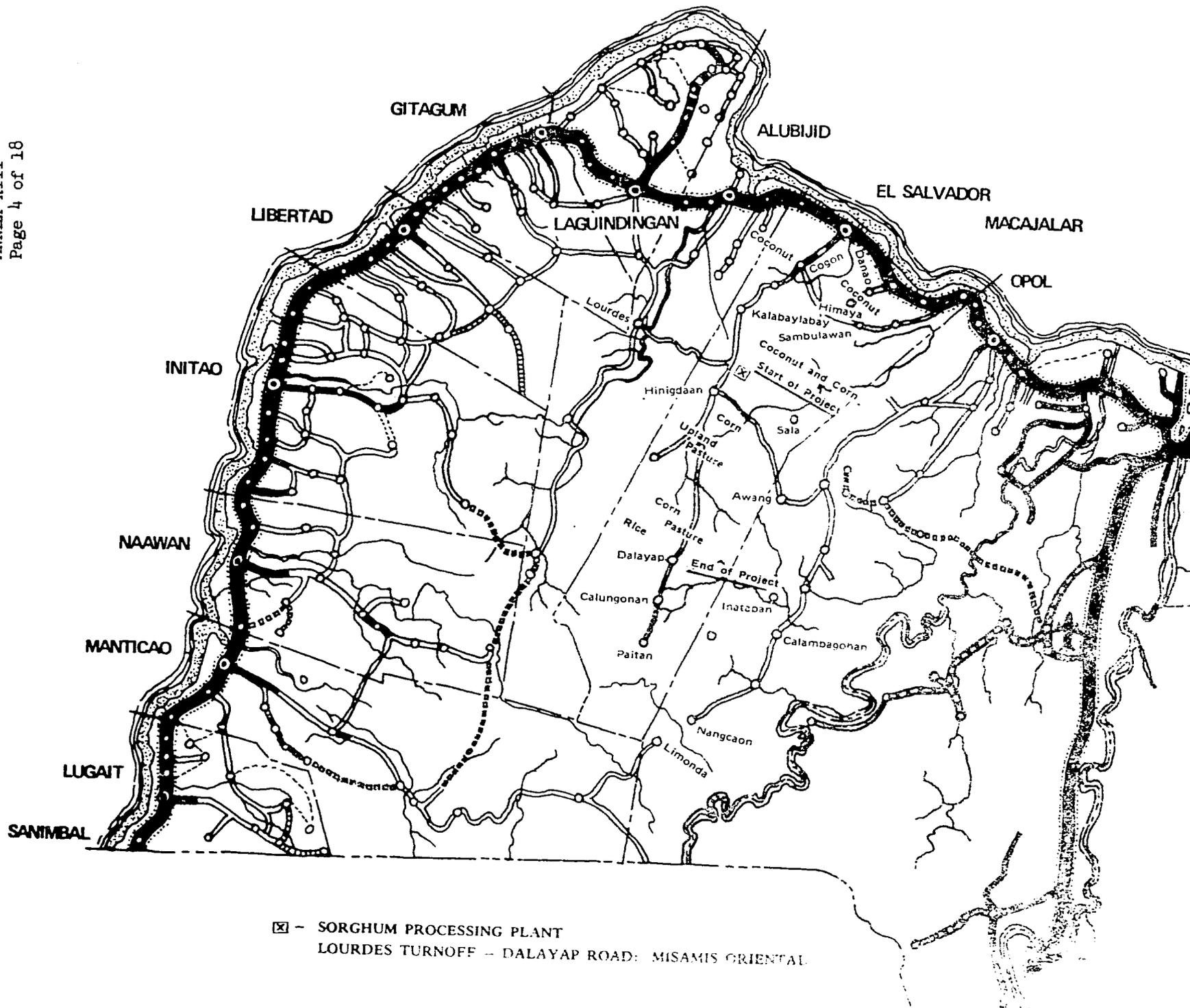
The existing road is a rudimentary earth road which passes through rolling terrain and is generally without gravel surfacing. The road is opened to four-wheel drive vehicles for part of the year. In addition the absence of a structure across the Molugan River is an obstacle to road use.

Average traffic is low along the segment under study although local traffic is of some importance at the beginning of the segment near the



**LOURDES TURNOFF -
DALAYAP ROAD**

INTERNATIONAL TREATY LIMITS
**MAP SHOWING PROJECT ROAD IN MISAMIS ORIENTAL PROVINCE
 MINDANAO, PHILIPPINES**



Lourdes Turnoff. No consideration has been given to savings in transport costs here since average traffic levels are very low. The inclusion of savings in transport costs would not affect the results significantly.

Proposed Improvement Level

Costs have been estimated for the improvement of the road to a standard 6 meter wide carriageway and 1.5 meter shoulders with 20 cm sub-base and 10 cm base courses at 1,150,000^{1/} pesos including approximately 50,000 pesos for a perforated spillway at the Molugan River crossing. The estimates are so rough that no distinction in this case is made between financial and economic costs of construction. For our purpose the financial costs are used as economic costs.

For the above road design standard, unit costs of construction are approximately 135,000 pesos per kilometer. Design standards could probably be compromised since the road by its nature is a penetration road into the hinterland. Estimated future traffic levels would probably not justify the construction of more than a 4 or 5 meter wide road. Unit costs for a 4 meter wide road are estimated to be approximately 770,000 pesos including the 50,000 for the structure at the Molugan River.

^{1/} Source: Provincial Engineer, Misamis Oriental, October, 1974

Maintenance

There is effectively little maintenance at present on the road. As emergencies arise, repairs and maintenance are effected. This study assumes that maintenance costs at present are zero and that future maintenance will require 2000 to 4000 pesos per kilometer depending on construction standards. For the sake of simplification, no variation in maintenance costs for different traffic levels have been considered.

Preliminary Selection Criteria

The road sub-project is assumed to satisfy the preliminary selection criteria. A cursory examination of the road relative to the criteria indicates that the preliminary criteria will likely be satisfied. At the time of a refinement of the data and analysis for this road sub-project, the roads adherence to the preliminary selection criteria should be verified.

Influence Area

For the purpose of this study the influence area of the road is assumed to follow the municipal boundaries. The municipalities adjacent

to the municipality of El Salvador are also elongated and served by roads along their main municipal axes. More detailed study and investigation would more precisely define the area of influence, but would likely not result in significant changes.

Project Benefits

The road sub-project can functionally be classified into a low traffic volume minor feeder road or penetration road. The road does not provide year round access to the agricultural areas. Carabaos (water buffalo) sleds are a favorite for transporting goods between producing areas and the all weather road system. The road in its present condition represents a constraint on agricultural production.

In this study, the additional net revenue to farmers from increased corn production due to road will be the major benefit from road improvement. Only corn marketed outside of the producing area is considered since it is not expected that corn for home consumption will be materially affected by road conditions. The production of other marketed crops would also benefit from road improvement. Increased production of all crops which are marketed in significant quantities should be included in the analysis. Corn production is not particularly sensitive to road conditions as compared for example to rice and sugar cane, although there are noticeable differences between the high quality of farm areas in other parts of the municipality of El Salvador served by all weather roads as compared to farms in the area of influence of this road segment.

Although all weather road access to the area of influence of the road is a necessary condition for increased agricultural production it is not a sufficient condition. Road improvement would allow easier access for agricultural inputs including extension services, fertilizer, etc. and the spreading of high yield varieties and technology into the more remote areas. The extension of Philippine Government program of supervised agricultural credit is likely to be of more importance in increasing corn production in the area served by the road than road improvement and would be complement to road improvement.

The major social benefit would be the provision of easier access to health and market facilities at Kalabaylabay and the Poblacion of El Salvador for the inhabitants of Hinigdaan and Kalungunan. Also those providing social services to the area served by the road would be greatly assisted in the discharge of their duties.

Quantification of Induced Corn Production

The basic source documents used for estimating induced corn production from road improvement are the 1959-60 Agricultural Census of the Philippines for the Province of Misamis Oriental and the preliminary results from the 1970-71 Agricultural Census which has not yet appeared in published form.

The data presented in Table 1 shows arable land planted to temporary crops such as corn decreased approximately 16% in Misamis Oriental

between 1960 and 1971 while the municipality shows an increase of about 20% for the same period. Idle land in El Salvador decreased from 490.9 hectares in 1959-60 to 257.7 hectares in 1970-71.

Table 2 presents data on areas planted for corn production for 1959-60 and 1970-71. The province shows an increase in area planned to corn from 53,276.6 hectares to 55,079.7 hectares for the period and El Salvador from 3111.2 hectares to 3690.8 for the same period. In spite of the more extensive use of land for corn, both total corn production dropped and yields decreased from 883 Kilos/hectare. The municipality shows a change from 569 Kilos/Hectare to 432 Kilos/Hectare. The production statistics are partially supported by evidence from the Misamis Oriental Provincial Agriculturist in Table 3. Here data is available only for the 1962-1973 period. The 1971 statistics from the census and the Provincial Agriculturist are fairly close.

On the basis of field interviews about 70% of the total municipal corn production is in the area of influence of the road. Marketed production is estimated at approximately 50% of total production. (See Table 3) These estimates should be refined when better estimates are available.

The basic approach to estimating the net income from induced corn production due to road improvement is to project corn production over the evaluation period without road improvement and with road improvement alone. The differences in annual production are the estimated quantities of corn induced by greater access between the producing areas and the all weather road network. By estimating the net income to farmers per metric ton of increased production, and multiplying these by the annual estimates of increased corn production, the annual net value to farmers due to road improvement is calculated.

Corn production for 1971 in the area of influence of the road has been estimated at 558 metric tons (See Tables 3 & 4). Estimates of future corn production without road improvement are based on the projection of the historical rate of provincial production between 1962 and 1973 (See Table 3) of approximately 5% per year from 432 kilos/Hectare until the former peak municipal yield of 569 Kilos/Hectare of the 1959-60 cropping season is achieved. It is assumed that the approximately 1292 hectares of marketed corn production in the area of influence of the road does not change. Therefore, in 1971 corn production is estimated at 735 tons and is considered to remain at this level without road improvement. (See Table 4)

With road improvement two forecasts are made. The first is based on an average rate of development and assumes an increase in yield from 525 Kilos/Hectare in 1975 to 1000 Kilos/Hectare (17.5 Cavans (57 Kilos) /Hectare) in 1985 and that an additional 50 Hectares of land will be turned from idle to corn producing land. Therefore in 1985, 1342 (1292 + 50) hectares are estimated to produce 1342 tons of corn. The change from 678 tons in 1975 to 1342 tons in 1985 is assumed to be linear. (See Table 4, Column 2). The differences between Columns (2) and (1) are the estimated annual volumes of induces production shown in Column (3) for this assumption.

The second forecast is based on a high rate of development in the road service area and assumes that yields will increase from 525 kilos/Hectare in 1975 to 1400 kilos/hectare (24.6 cavans (57 kilos/Hectare)

in 1985. The 24.6 cavans is less than one half of the target yields for high yield corns. In addition, it is assumed that an additional 100 hectares of land will be brought into corn production by 1985. Therefore, in 1985 corn production is estimated at 1392 hectares at 1400 kilos/hectare or approximately 1950 kilos/Hectare. Subtracting the estimates of annual corn production with and without road improvement, gives induced marketed production. (Table 4, Column (7)),

Estimating Net Income to Farmers Per Ton of Corn

Net income to farmers from increases in corn production varies with yields. Yields are assumed to increase from 525 kilos per hectare to 1000 kilos/hectare and to 1400 kilos per hectare under an assumed higher rate of growth. Table 5 presents estimates of net returns to farmers under different yields. These estimates based on the World Bank publication are at best approximations. Data from the Provincial Agriculturist have also been used for the estimates. Net income is assumed to increase linearly between 1975 and 1985. By multiplying induced annual marketed corn production in metric tons by the net income to farmers in Pesos per metric ton, an annual net income stream is calculated. (Table 4, Columns (5) and (9)).

The Internal Rate of Return

The internal rate of return calculations are summarized in Tables 6 and 7. These are self-explanatory and follow the conventional procedures for calculating the IRR. The IRR is defined as the rate of interest at which the sum of the present values of the benefits and the costs over a period renders them equivalent in magnitude or zero if subtracted. A benefit cost calculation has been made also. The results of the IRR calculations are summarized below:

	First Assumption (Average Growth Rate)	Second Assumption (High Growth Rate)
6 meter carriageway	2%	15%
4 meter carriageway	9%	25%

Under the first assumption of an average rate of development in the area of influence of the road, neither the 6 meter nor the 4 meter carriageway roads meet the criteria of a minimum acceptable rate of return of 15%. If other benefits were included in the analyses of say increased production of other crops, it is highly improbable that the 6 meter road with an IRR of 2% would achieve a rate of 15% and unlikely that the 4 meter road would increase from 9% to 15%.

Both roads meet the minimum rate of return under the second assumption of a surge in development in the area of influence of the road due to road improvement. The IRR's for the 6 meter and 4 meter roads are 15% and 25% respectively.

It would be justified to construct a high standard 6 meter wide carriageway road if the area shows exceptional promise for development. The area shows less than exceptional promise.

A road of say an intermediate standard (5 meter carriageway) would probably be justified under the assumption of a greater than average rate of development but less than a very high rate of development in the service area.

The analyses could be repeated to verify this conclusion.

TABLE 1
LAND USE

PROVINCE OF MISAMIS ORIENTAL AND MUNICIPALITY OF EL SALVADOR
(HECTARES)

	ESTIMATED TOTAL AREA OF LAND	ARABLE LAND PLANTED TO TEMPORARY CROPS	LYING IDLE ^{1/}	PLANTED TO PERMANENT CROPS	PERMANENT PASTURE	FOREST	ALL OTHER LANDS
MISAMIS ORIENTAL	379,9283						
1960		36,906.1	20,530.9	65,610.8	5020.2	10,119.1	2617.8
1971		30,967.0	15,259.2	62,956.9	7735.2	6,814.2	5014.2
EL SALVADOR	13,670 ^{2/}						
1960		1554.3	490.9	1475.0	-	75.2	0.8
1971		1862.0	257.7	1627.5	68.2	2.5	38.5

^{1/} Includes Land temporarily fallow and temporary fallow

^{2/} Subject to correction

Source: Bureau of Census and Statistics
Manila, "Census of the Philippines - 1960 -
Agriculture" and Preliminary Results of the 1970-71 Census

TABLE 2
CORN - AREA PLANTED AND PRODUCTION

PROVINCE OF MISAMIS ORIENTAL AND MUNICIPALITY OF EL SALVADOR

	<u>AREA PLANTED (HECTARES)</u>				<u>1/</u> <u>(PRODUCTION (METRIC TONS))</u>				<u>2/</u> <u>YIELD</u>
	<u>FIRST</u> <u>CROP</u>	<u>SECOND</u> <u>CROP</u>	<u>THIRD</u> <u>CROP</u>	<u>TOTAL</u>	<u>FIRST</u> <u>CROP</u>	<u>SECOND</u> <u>CROP</u>	<u>THIRD</u> <u>CROP</u>	<u>TOTAL</u>	<u>(KILOS/HECTARE)</u>
MISAMIS ORIENTAL									
1960	21936.6	16890.7	14449.3	53276.6	2201	1390	1115	4706	883
1971	22490.4	20876.9	11712.3	55079.7	1497	1075	437	3009	546
EL SALVADOR									
1960	1321.3	1088.7	701.2	3111.2	916	502	351	1769	569
1971	1689.7	1594.7	406.5	3690.8	816	634	145	1595	432

1/ Converted to tons from Cavans (57 Kilograms)

2/ Calculated here.

Source: Bureau of Census and Statistics
Manila, "Census of the Philippines - 1960 -
Agriculture" and Preliminary Results of the 1970-71 Census

TABLE 3
CORN PRODUCTION
(METRIC TONS)

	<u>AREA OF INFLUENCE OF</u> <u>LOURDES TURNOFF - DALAYAP ROAD</u>		<u>ESTIMATED</u> <u>PRODUCTION ^{3/}</u>	<u>ESTIMATED</u> <u>MARKETED PRODUCTION ^{4/}</u>
	<u>MISAMIS</u> <u>ORIENTAL</u>	<u>EL SALVADOR</u>		
1960	(4706) ^{1/}	(1769) ^{1/}		
1962	2522			
1963	2859			
1964	2645			
1965	3202			
1966	3129			
1967	2830			
1968	3264			
1969	3109			
1970	3125			
1971	3215			
	(3009) ^{2/}	(1595) ^{2/}	1116	558
1972	3638			
1973	4249			

1962-1973
Compounded Annual
Growth Rate
Approximately 5% per year

^{1/} From 1959-60 Census

^{2/} From 1970-71 Census

^{3/} Estimated at 70% of Municipal Production

^{4/} Estimated at 50% of Estimated Production

Source: Provincial Agriculturalist, Misamis Oriental, October, 1974

TABLE 4
MARKETED CORN PRODUCTION
AREA OF INFLUENCE OF THE LOURDES-DALAYAP ROAD

	FIRST ASSUMPTION (AVERAGE GROWTH RATE)					SECOND ASSUMPTION (HIGH GROWTH RATE)			
	WITH ROAD IMPROVEMENT					WITH ROAD IMPROVEMENT			
ESTIMATED MARKETED PRODUCTION WITHOUT ROAD IMPROVEMENT (METRIC TONS)	ESTIMATED MARKETED PRODUCTION (METRIC TONS)	INDUCED MARKETED PRODUCTION (METRIC TONS)	NET INCOME TO FARMERS PER TON (PESOS/TON)	NET INCOME TO FARMERS FROM INDUCED MARKETED PRODUCTION (1000 PESOS)	ESTIMATED MARKETED PRODUCTION (METRIC TONS)	INDUCED MARKETED PRODUCTION (METRIC TONS)	NET INCOME TO FARMERS PER TON (PESOS/TON)	NET INCOME TO FARMERS FROM INDUCED MARKETED PRODUCTION (1000 PESOS)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
		(2)-(1)		(4) x (3)		(6)-(1)		(8) x (7)	
1971	558(432) ^{2/}								
1972	586 (454)								
1973	615 (476)								
1974	646 (500)								
1975	678 (525) ^{2/}	-	457	-	678(525) ^{2/}	-	457	-	
1976	712 (551)	744	466	15	805	93	468	44	
1977	735 (569)	811	476	36	932	197	480	95	
1978	735	877	485	69	1060	325	491	160	
1979	735	944	494	103	1188	453	503	228	
1980	735	1010	504	139	1314	579	514	298	
1981	735	1076	513	175	1441	706	525	371	
1982	735	1143	522	213	1568	833	537	447	
1983	735	1209	531	252	1696	961	548	527	
1984	735	1276	541	293	1823 ^{2/}	1088	560	609	
1985	735	1342(1000) ^{2/}	607	334	1950(1400) ^{2/}	1215	571	694	

1/ See Table 5 - Net income is assumed to grow linearly between 1975 and 1985.

2/ Assumed yields in Kilograms per Hectare in parenthesis
Yields have been assumed to grow linearly between 1975 and 1985.

Source: The Consultant

TABLE 5
CORN: COSTS AND RETURNS ^{1/}

YIELD ($\frac{\text{Kilos}}{\text{Hectare}}$)	<u>525</u>	<u>1000</u>	<u>1400</u>
<u>Total Revenue/Hectare</u> P.80/Kilo	420 Pesos	800 Pesos	1120 Pesos
<u>Total Costs/Hectare</u>			
Farm Operations(Labor) ^{2/}	180 Pesos	250 Pesos	310
Seeds	-	-	10
<u>Net Revenue</u>	240 P/Hectare	550 P/Hectare	800 P/Hectare
Net Revenue Per Ton	$\frac{240}{.525} = 457$ P/Ton	550 P/Ton	$\frac{800}{1.4} = 571$ P/Ton

^{1/} The construction of this table has been guided by data presented the World Bank Publication "Agricultural Sector Survey - Philippines" - Vol. IV, Annex 14, Table 7.

^{2/} Farm and Family Labor Shadow priced at 4 Pesos/Day. The minimum wage for farm labor is approximately 6.50 Pesos/Day in Misamis Oriental.

TABLE 6
IRR CALCULATIONS FOR LOURDES TURNOFF - DALAYAP ROAD
(IN THOUSAND PESOS)

	(FIRST ASSUMPTION (AVERAGE GROWTH RATE) AND 6 METER ROAD)				(FIRST ASSUMPTION (AVERAGE GROWTH RATE) AND 4 METER ROAD)				
	PROJECTED BENEFITS		PROJECTED COSTS		PROJECTED BENEFITS			PROJECTED COSTS	
NET INCOME TO FARMERS FROM INDUCED MARKETED PRODUCTION	MAINTENANCE COST SAVINGS	TOTAL NET BENEFITS	ROAD IMPROVEMENT COSTS	TOTAL COSTS	NET INCOME TO FARMERS FROM INDUCED MARKETED PRODUCTION	MAINTENANCE COST SAVINGS	TOTAL NET BENEFITS	ROAD IMPROVEMENT COSTS	TOTAL COSTS
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1975	-	10 ^{1/}	1150	1150	-		10 ^{1/}	770	770
1976	15	-34	-19		15	-17	-2		
1977	36	-34	2		36	-17	19		
1978	69	-34	35		69	-17	52		
1979	103	-34	69		103	-17	86		
1980	139	-34	105		139	-17	122		
1981	175	-34	141		175	-17	158		
1982	213	-34	179		213	-17	196		
1983	252	-34	218		252	-17	235		
1984	293	-34	259		293	-17	276		
1985	334	-34	300		334	-17	317		
Present Value at 10%		633		1150	Present Value at 10%		737		770
Present Value at 2%		1115		1150	Present Value at 9%		784		770
. . . IRR is 2%				is	. . . IRR is 9%				
Benefit Cost Ratio (15% Discount)/Less than 1.0					Benefit Cost Ratio (15% Discount) is less than 1.0				

1/ The sum of the present values of the salvage or remaining utility of major drainage structures after the 10-Year evaluation period, with assumed economic lives of 30 years, is approximately 20% of the original construction costs at discount rates near 15%. Twenty percent of the construction costs of all major drainage structures is therefore added to the benefits at the beginning of the construction year (.20 x 50,000 = 10,000 Pesos)

Source: The Consultant

TABLE 7
IRR CALCULATIONS FOR LOURDESS TURNOFF - DALAYAP ROAD
(IN THOUSAND PESOS)

	<u>SECOND ASSUMPTION (HIGH GROWTH RATE) AND 6 METER ROAD</u>					<u>SECOND ASSUMPTION (HIGH GROWTH RATE) AND 4 METER ROAD</u>				
	<u>PROJECTED BENEFITS</u>			<u>PROJECTED COSTS</u>		<u>PROJECTED BENEFITS</u>			<u>PROJECTED COSTS</u>	
	<u>NET INCOME TO FARMERS FROM INDUCED MARKETED PRODUCTION</u>	<u>MAINTENANCE COST SAVINGS</u>	<u>TOTAL NET BENEFITS</u>	<u>ROAD IMPROVEMENT COSTS</u>	<u>TOTAL COSTS</u>	<u>NET INCOME TO FARMERS FROM INDUCED MARKETED PRODUCTION</u>	<u>MAINTENANCE COST SAVINGS</u>	<u>TOTAL NET BENEFITS</u>	<u>ROAD IMPROVEMENT COSTS</u>	<u>TOTAL COSTS</u>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1975	-		10 ^{1/}	1150	1150	-		10 ^{1/}	770	770
1976	44	-34	10			44	-17	27		
1977	95	-34	61			95	-17	78		
1978	160	-34	126			160	-17	143		
1979	228	-34	194			228	-17	211		
1980	298	-34	264			298	-17	281		
1981	371	-34	337			371	-17	354		
1982	447	-34	413			447	-17	430		
1983	527	-34	493			527	-17	510		
1984	609	-34	575			609	-17	592		
1985	694	-34	660			694	-17	677		
	Present Value at 16%		1113		1150	Present Value at 25%		753		770
	Present Value at 15%		1178		1150	Present Value at 24%		790		770
						Present Value at 23%		829		770
						Present Value at 20%		966		770
						Present Value at 15%		1265		770
						IRR is 25%				
						Benefit Cost Ratio (15%) is 1.6				

Benefit Cost Ratio (15%) is 1.0

^{1/} The sum of the present values of the salvage or remaining utility of major drainage structures after the 10-year evaluation period, with assumed economic lives of 30 years, is approximately 20% of the original construction costs at discount rates near 15%. Twenty percent of the construction costs of all major drainage structures is therefore added to the benefits at the beginning of the construction year (.20 x 50,000 = 10,000 Pesos)

Source: The Consultant

Work Sheets

	6 Meter Road First Assumption			4 Meter Road First Assumption	
	<u>10%</u>	<u>8%</u>	<u>2%</u>	<u>10%</u>	<u>9%</u>
1975	10		10	10	10
1976	-17		-19	-2	-2
1977	2		2	16	16
1978	26		33	39	40
1979	47		64	59	61
1980	65		95	76	79
1981	80		125	89	94
1982	92		156	101	107
1983	102		186	110	118
1984	110		217	117	127
1985	<u>116</u>		<u>246</u>	<u>122</u>	<u>134</u>
	633		1115	737	784

Work Sheets

	6 Meter Road Second Assumption		4 Meter Road Second Assumption				
	<u>15%</u>	<u>16%</u>	<u>15%</u>	<u>20%</u>	<u>23%</u>	<u>24%</u>	<u>25%</u>
1975	10	10	10	10	10	10	10
1976	9	9	23	22	22	22	22
1977	46	45	60	54	52	51	50
1978	83	81	94	83	77	75	73
1979	111	107	121	102	92	89	86
1980	131	126	140	113	100	96	92
1981	146	138	153	119	102	97	93
1982	155	146	162	120	100	95	90
1983	161	150	167	119	97	91	85
1984	163	151	168	115	82	85	79
1985	<u>163</u>	<u>150</u>	<u>167</u>	<u>109</u>	<u>85</u>	<u>79</u>	<u>73</u>
	1178	1113	1265	966	829	790	753

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CHECKLIST OF STATUTORY CRITERIA

BASIC AUTHORITY

1. E.A. 103; 104; 105;
106; & 107. Is loan being made

a. for agriculture, rural develop-
ment or nutrition;

This project will contribute to agriculture output and distribution by providing access to and egress from agriculture areas. The cost of transportation of agriculture inputs and outputs shall be greatly reduced.

b. for population planning or health; Not Applicable (N.A.)

c. for education, public administration; N.A.
or human resources development;

d. to solve economic and social
development problems in fields such as
transportation, power, industry, urban
development, and export development; N.A.

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e. in support of the general economy of the recipient country or for development programs conducted by private or international organizations.

N.A

COUNTRY PERFORMANCE

Progress Towards Country Goals

2. ^s FAA 5201 (b) (5), (7) & (8) ; § 208

A. Describe extent to which country is:

(1) Making appropriate efforts to increase food production and improve means for food storage and distribution.

Food production in top priority of the Marcos administration. Several programs are being implemented to achieve self-sufficiency in rice and corn and accelerate production of livestock, poultry, fish, fruits and vegetables. This project is another example of the GOP's efforts to increase food production and distribution.

(2) Creating a favorable climate for foreign and domestic private enterprise and investment.

See FAA 620 (e) (1) below.

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(3) Increasing the public's role in the developmental process.

The four-year agriculture program is increasing the productive capability of Philippine farmers. The Department for Local Government and Community Development carries out programs at the barrio (village) level throughout the Philippines. A Decentralization Act providing more autonomy to the Province was enacted in 1967. The Provincial Development Assistance Program is operating in seventeen provinces.

Additionally, in an attempt to redistribute income and raise the rural standard of living, the GOP has recently embarked upon an aggressive land reform program, and is well under way with a country-wide rural electrification program.

(4) (a) Allocating available budgetary resources to development.

(a) More than 70 percent of the national budget is allocated to social and economic development. One-fourth of the budget goes to education, nearly 10 percent to agriculture and natural resources, and almost 20 percent to transportation and communications.

(b) Diverting such resources for unnecessary military expenditure (See also Item No. 20) and intervention in affairs of other free and independent nations.) (See also Item No. 11)

(b) Less than 15 percent of the budget goes for national defense.

(5) Making economic, social, and political reforms such as tax collection improvements and changes in land tenure arrangements, and making progress toward respect for the rule of law, freedom of expression and of the press, and recognizing the importance of individual freedom, initiative, and private enterprise.

The GOP, ever since its establishment as an independent nation in 1946, has patterned its government after that of the United States, adopting the same democratic principles and strongly supporting a free and open society. On Sept. 22, 1972 President Marcos, citing a serious threat to their system from both the extreme left and right, invoked martial law and, ruling by decree, ordered an accelerated implementation of essential reforms long needed to

improve the efficiency of the government, to reduce widespread crime and corruption, to speed development efforts aimed primarily at improving the social and economic well-being of lower income groups. However, under Martial Law political activity and freedom of the press had been curtailed. In this regard President Marcos is inaugurating an all-encompassing nationwide land reform program. Over the last five years the GOP has increased revenues through improved administration and new tax laws, the most recent being/stabilization tax imposed on traditional high level exports following the devaluation of the peso in 1970.

(6) Willing to contribute funds to the project or program.

(7) Otherwise responding to the vital economic, political, and social concerns of its people, and demonstrating a clear determination to take effective self-help measures.

(6) The GOP will provide 100 percent of the funds necessary to construct the project. The loan will reimburse the GOP 75 percent of project cost after sub-projects are completed and accepted.

(7) As a result of the disastrous summer of 1972 floods, the Marcos Administration has embarked on a large scale reconstruction program with the help of USAID. This program is directly meeting the needs of the devastated communities of Luzon. Included in the program are: a school reconstruction and textbook program as well as on road building, irrigation and other infrastructure programs.

B. Are above factors taken into account in the furnishing of the subject assistance?

B. Yes.

Treatment of U.S. Citizens and Firms

3. FAA § 620(c). If assistance is to government, is the government liable as debtor or unconditional guarantor on any debt to a U.S. citizen for goods or services furnished or ordered where (a) such citizen has exhausted available legal remedies and (b) debt is not denied or contested by such government?

No.

4. FAA § 620 (e) (1)^s. If assistance is to a government, has it (including government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities?

Under the Parity Amendment to the 1935 Philippine Constitution U.S. citizens were given certain rights, including the ownership of land and the lease of land owned by the Government otherwise reserved under the Constitution to citizens of the Philippines, until July 3, 1974. The Philippine Government has ruled that the rights given in the Parity Amendment have no validity after July 3, 1974, but has deferred until May 27, 1975, action to implement its ruling in respect to ownership of private land and leases of publicly owned land. In the meantime, with the support of the U.S. Government, the affected U.S. citizens are seeking to work out with the Government of the Philippines implementation arrangements which if carried out as now envisaged would result in arrangements which would not contravene FAA Sec. 620 (e)(1).

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5. FAA § 620(0); Fishermen's Protective Act, § 5. If country has seized, or imposed any penalty or sanction against, any U.S. fishing vessel on account of its fishing activities in international waters,

N.A.

a. has any deduction required by Fishermen's Protective Act been made?

b. has complete denial of assistance been considered by A.I.D. Administrator?

Relations with U.S. Government and Other Nations

6. FAA § 620 (a). Does recipient country furnish assistance to Cuba or fail to take appropriate steps to prevent ships or aircraft under its flag from carrying cargoes to or from Cuba?

No.

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7. FAA § 620(b). If assistance is to a government, has the Secretary of State determined that it is not controlled by the international Communist movement? **Yes.**
8. FAA § 620(d). If assistance is for any productive enterprise which will compete in the United States with United States enterprise, is there an agreement by the recipient country to prevent export to the United States of more than 20% of the enterprise's annual production during the life of the loan? **N. A.**
9. FAA § 620(f). Is recipient country No. a Communist country?
10. FAA § 620(i). Is recipient country No. in any way involved in (a) subversion of, or military aggression against, the United States or any country receiving U.S. assistance, or (b) the planning of such subversion or aggression?
11. FAA § 620(j). Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction, by mob action, of U.S. property? **11. The GOP has taken all reasonable measures to protect U.S. property. On infrequent occasion when damage has occurred, proper compensation has been made without delay.**

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12. FAA § 620(l). If the country has failed to institute the investment guaranty program for the specific risks of expropriation, in convertibility or confiscation, has the A.I.D. administration within the past year considered denying assistance to such government for this reason? N.A.
13. FAA § 620(n). Does recipient country furnish goods to North Viet-Nam or permit ships or aircraft under its flag to carry cargoes to or from North Viet-Nam? No.
14. FAA § 620(q). Is the government of the recipient country in default on interest or principal of any A.I.D. loan to the country? No.
15. FAA § 620(t). Has the country severed diplomatic relations with the United States? If so, have they been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption? No.
16. FAA § 620(u). What is the payment status of the country's U.N. obligations? If the country is in arrears, were such arrearages taken into account by the A.I.D. Administrator in determining the current A.I.D. Operational Year Budget? 16. The Philippines is not in default with respect to its dues, assessments or other obligations to the U.S. The Loan Agreement and disbursement procedures will ensure that loan funds are not used for payment of U.N. obligations.

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17. FAA § 481. Has the government of recipient country failed to take adequate steps to prevent narcotic drugs and other controlled substances (as defined by the Comprehensive Drug Abuse Prevention and Control Act of 1970) produced or processed, in whole or in part, in each country, or transported through such country, from being sold illegally within the jurisdiction of such country to U.S. Government personnel or their dependents, or from entering the U.S. unlawfully?

No.

18. FAA, 1973 § 29. If (a) military base is located in recipient country, and was constructed or is being maintained or operated with funds furnished by U.S., and (b) U.S. personnel carry out military operations from such base, has the President determined that the government of recipient country has authorized regular access to U.S. correspondents to such base?

Yes. (Presidential Determination No. 74-14 dated 1/20/74).

Military Expenditures

19. FAA § 620(s). What percentage of country budget is for military expenditures? How much of foreign exchange resources spent on military equipment? How much spent for the purchase of sophisticated weapons systems? (Consideration of these points is to be coordinated with the Bureau for Program and Policy Coordination, Regional Coordinators and Military Assistance Staff (PPC/RC).)

19. Annual defense budgets average less than 15% of the national budget. Approximately one-third of this amount is for maintenance of peace and order. Philippine foreign exchange resources used to acquire military equipment are negligible. We know of no diversion of either development assistance or of PL 480 sales to military expenditures. We are not aware of any diversion of Philippine resources for unnecessary military expenditures.

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CONDITIONS OF THE LOAN

General Soundness

20. FAA § 201(d). Information and conclusion on reasonableness and legality (under laws of country and the United States) of lending and relending terms of the loan.

The rate of interest is considered reasonable and repayment of the loan with interest is within the financial capability of the borrower. Interest through the grace period will be at the rate of 2% per annum, and 3% thereafter. This rate is not higher than the applicable legal rate of interest in the Philippines.

21. FAA § 201(b) (2); § 201(c)

Information and conclusion on activity's economic and technical soundness. If loan is not made pursuant to a multilateral plan, and the amount of the loan exceeds \$100,000, has country submitted to A.I.D. an application for such funds together with assurances to indicate that funds will be used in an economically and technically sound manner?

All project development is covered by feasibility studies assuring viability.

22. FAA § 201(b)(2) Information and conclusion on capacity of the country to repay the loan, including reasonableness of repayment prospects.

The GOP is the borrower and the prospects for loan repayment are good.

23. FAA § 201(b)(1) Information and conclusion on availability of financing from other free-world sources, including private sources within the United States.

Financing is not considered to be available from other sources on terms comparable to this proposed loan.

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24. FAA § 611(a)(1). Prior to signing of loan will there be (a) engineering, financial, and other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the United States of the assistance? Yes.
25. FAA § 611 (a)(2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of loan? All legislative authority exist.
26. FAA § 611(e). If loan is for Capital Assistance, and all U.S. assistance to project now exceeds \$1 million, has Mission Director certified the country's capability effectively to maintain and utilize the project? Yes.

Loan's Relationship to Achievement of Country and Regional Goals

27. FAA § 207; § 113
Extent to which assistance reflects appropriate emphasis on: (a) encouraging development of democratic, economic, political, and social institutions; (b) self-help in meeting the country's food needs; (c) improving availability of trained manpower in the country; (d) programs designed to meet the country's health needs;
- (a) Indirectly the project encourages development of institutions by making rural areas more accessible.
(b) The project will contribute to agriculture output.
(c) N.A.
(d) N.A.

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(e) other important areas of economic, political, and social development, including industry; free labor unions, cooperatives, and Voluntary Agencies; transportation and communication; planning and public administration; urban development, and modernization of existing laws; or
(f) integrating women into the recipient country's national economy.

(e) This project puts primary emphasis on transportation and communication.

(f) For discussion of the considerable role of women, see pg. 4 this paper.

28. FAA § 209. Is project susceptible of execution as part of regional project? If so why is project not so executed?

No

29. FAA § 201(b)(4) Information and conclusion on activity's relationship to, and consistency with, other development activities, and its contribution to realizable long-range objectives.

This project is consistent with the GOP new society policy of assisting the common man. See page 7 of CAP.

30. FAA § 201(b)(9) Information and conclusion on whether or not the activity to be financed will contribute to the achievement of self-sustaining growth.

Improved transportation and communication will contribute to self-sustained growth.

31. FAA § 209;
Information and conclusion whether assistance will encourage regional development programs.

N.A.

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32. FAA § Section 111. Discuss the extent to which the loan will strengthen the participation of the urban and rural poor in their country's development, and will assist in the development of cooperatives which will enable and encourage greater numbers of poor people to help themselves toward a better life.
- This project will involve the Provinces in an activity that was formerly left to the national government and therefore encourage participation of rural poor people. No effect on development of cooperatives.
33. FAA § 201(f). If this is a project loan, describe how such project will promote the country's economic development taking into account the country's human and material resource requirements and the relationship between ultimate objectives of the project and overall economic development.
- This project has a very direct influence on promoting the country's economic development by contributing to agriculture production and distribution.
34. FAA § 281(a). Describe extent to which the loan will contribute to the objective of assuring maximum participation in the task of economic development on the part of the people of the country, through the encouragement of democratic, private, and local governmental institutions.
- N.A.
35. FAA § 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country: utilizes the country's intellectual resources to encourage institutional development; and supports civic education and training in skills required for effective participation in governmental and political processes essential to self-government.
- More economical and convenient transportation will have a wide range of influence on the rural communities by the fact that government and social institutions and services will be more readily available and the rural people more accessible.
36. FAA §201(b)(3). In what ways does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of production capabilities?
- Better roads will undoubtedly increase agriculture output by providing cheaper transportation for inputs and outputs.

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37. FAA § 601(a). Information and conclusions whether loan will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture, and commerce; and (f) strengthen free labor unions.
- (a) only to the extent that agriculture output exceeds local needs and will be exported. However, it will encourage use of imported fertilizer.
(b) it will encourage small farmers to increase production (c) indirectly (d) indirectly (e) cheaper transportation will contribute to agriculture and commerce (f) N.A.
38. FAA § 619. If assistance is for newly independent country; is it furnished through multilateral organizations or plans to the maximum extent appropriate?
- N.A.

Loan's Effect on U.S. and A.I.D. Program

39. FAA § 201(b)(6) Information and conclusion on possible effects of loan on U.S. economy, with special reference to areas of substantial labor surplus, and extent to which U.S. commodities and assistance are furnished in a manner consistent with improving the U.S. balance of payments position.
- N.A. Because this is a local currency project.
40. FAA § 202(a) Total amount of money under loan which is going directly to private enterprise, is going to intermediate credit institutions or other borrowers for use by private enterprise, is being used to finance imports from private sources, or is otherwise being used to finance procurements from private sources.
- Total loan will be used to establish a Special Letter of Credit in a U.S. bank to finance GOP purchases in the U.S.
Private Enterprise will participate in this project and procure will be from private sources.

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41. FAA § 601(b). Information and conclusion on how the loan will encourage U.S. private trade and investment abroad and how it will encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).
- Private enterprise is being used to the maximum extent practicable under this loan.
- This is a local currency project, therefore private U.S. participation will not be directly involved; however an SLC will be used for disbursement of these Loan funds which will be channeled through U.S. private enterprises.
42. FAA § 601(d). If a capital project, are engineering and professional services of U.S. firms and their affiliates used to the maximum extent consistent with the national interest?
- Philippine engineering firms and Provincial Engineering Offices are capable of designing and constructing this project without outside consulting assistance.
43. FAA § 602. Information and conclusion whether U.S. small business will participate equitably in the furnishing of good and services financed by the loan.
- U.S. small business will not participate because this is a local currency project and the goods and services to be provided are not the type normally of interest to them.
44. FAA § 620(h). Will the loan promote or assist the foreign aid projects or activities of the Communist-Bloc countries?
- No.
45. FAA § 621. If Technical Assistance is financed by the loan, information and conclusion whether such assistance will be furnished to the fullest extent practicable as goods and professional and other services from private enterprise on a contract basis. If the facilities of other Federal agencies will be utilized, information and conclusion on
- N.A.

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whether they are particularly suitable, are not competitive with private enterprise, and can be made available without undue interference with domestic programs.

Loan's Compliance with Specific Requirements

46. FAA § 110(a); § 208(e). In what manner has or will the recipient country provide assurances that it will provide at least 25% of the costs of the program, project, or activity with respect to which the Loan is to be made? The loan agreement will so provide and assurance obtained from the G.O.P.
47. FAA § 112. Will loan be used to finance police training or related program in recipient country? No.
48. FAA § 114. Will loan be used to pay for performance of abortions or to motivate or coerce persons to practice abortions? No.
49. FAA § 201(b). Is the country among the 20 countries in which development loan funds may be used to make loans in this fiscal year? Yes.
50. FAA § 201(d). Is interest rate of loan at least 2% per annum during grace period and at least 3% per annum thereafter? Yes.
51. FAA § 201(f). If this is a project loan, what provisions have been made for appropriate participation by the recipient country's private enterprise? Private engineering and construction firms will be used.
52. FAA § 504(a). Will all commodity procurement financed under the loan be from the United States except as otherwise determined by the President? Yes
53. FAA § 504 (b) What provision is made to prevent financing commodity procurement in bulk at prices higher than adjusted U.S. market price? N.A.

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54. FAA § 604(d). If the cooperating country discriminates against U.S. marine insurance companies, will loan agreement require that marine insurance be placed in the United States on commodities financed by the loan? Yes.
55. FAA § 604(e). If offshore procurement of agricultural commodity or product is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity? N.A.
56. FAA § 604(f). If loan finances a commodity import program, will arrangements be made for supplier certification to A.I.D. and A.I.D. approval of commodity as eligible and suitable? N.A.
57. FAA § 608(a). Information on measures to be taken to utilize U.S. Government excess personal property in lieu of the procurement of new items. Excess property is used extensively by the Provinces, no procurement of new equipment will be financed by the loan.
58. FAA § 611(b); App. § 101. If loan finances water or water-related land resource construction project or program, is there a benefit-cost computation made, insofar as practicable, in accordance with the procedures set forth in the Memorandum of the President dated May 15, 1962? N.A.

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59. FAA § 611(c). If contracts for construction are to be financed, what provision will be made that they be let on a competitive basis to maximum extent practicable? The GOP Standard practice of contracting is through competition.
60. FAA § 612(b); § 636(h). Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the United States are utilized to meet the cost of contractual and other services. The GOP is financing 100 percent of the project and the loan will reimburse the GOP in a Special Letter of Credit 75 percent of the project costs.
61. App. § 113. Will any of loan funds be used to acquire currency of recipient country from non-U.S. Treasury sources when excess currency of that country is on deposit in U.S. Treasury? The Philippines is not an excess currency country.
62. Section 30 and 31 of PL 93-189 (FAA of 1973). No.
Will any part of the loan be used to finance directly or indirectly military or paramilitary operations by the U.S. or by foreign forces in or over Laos, Cambodia, North Vietnam, South Vietnam, or Thailand?
63. Section 37 of PL 93 - 189 (FAA of 1973); App. § 111. No.
Will any part of this loan be used to aid or assist generally or in the reconstruction of North Vietnam?
64. FAA § 612(d). Does the United States own excess foreign currency and, if so, what arrangements have been made for its release? The Philippines is not an excess currency country.
65. FAA § 620(p). What provision is there against use of subject assistance to compensate owners for expropriated or nationalized property? The loan agreement will so provide.

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66. FAA § 620 (k). If construction of productive enterprise, will aggregate value of assistance to be furnished by the United States exceed \$100 million? N.A.
67. FAA § 636(f). Will any loan funds be used to finance purchase, long-term lease, or exchange of motor vehicle manufactured outside the United States, or any guaranty of such a transaction? No.
68. App. § 103. Will any loan funds be used to pay pensions, etc., for military personnel? No.
69. App. § 105. If loan is for capital project, is there provision for A.I.D. approval of all contractors and contract terms? AID will review and approve all contractors on the basis of recommendations made by local A & E firms which will ensure that contractors are qualified, cost are reasonable and that design and construction are acceptable. Standard form contracts which will in fact be used, will be approved by A.I.D.
70. App. § 107. Will any loan funds be used to pay UN assessments? No.
71. App. § 109. Compliance with regulations on employment of U.S. and local personnel. (A.I.D. Regulation 7). The loan agreement will so provide.

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72. App. § 110. Will any of loan funds be used to carry out provisions of FAA §§ 209 (d)? No.
73. App. § 112. Will any of the funds appropriated or local currencies generated as a result of AID assistance be used for support of police or prison construction and administration in South Vietnam or for support of police training of South Vietnamese? No.
74. App. § 114. Describe how the Committee on Appropriations of the Senate and House have been or will be notified concerning the activity, program, project, country, or other operation to be financed by the Loan. The project has been included in the FY 75 Congressional Presentation, Pg. 130.
75. App. § 601. Will any loan funds be used for publicity or propoganda purposes within the United States not authorized by Congress? No.
76. App. § 604. Will any of the funds appropriated for this project be used to furnish petroleum fuels produced in the continental United States to Southeast Asia for use by non-U.S. nationals? No.
77. MMA § 901.b; FAA § 640C.
- (a) Compliance with requirement that at least 50 per centum of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed with funds made available under this loan shall be transported on privately owned U.S.-flag commercial vessels to the extent that such vessels are available at fair and reasonable rates. This is a local currency project. No commodities will be transported on ocean vessels, and therefore, this section is inapplicable.
- (b) Will grant be made to loan recipient to pay all or any portion of such differential as may exist between U.S. and foreign-flag vessel rates? No.

DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D. C. 20523

OFFICE OF
THE ADMINISTRATOR

Loan No. 492-T-035

CAPITAL ASSISTANCE LOAN AUTHORIZATION

Provided from: Food and Nutrition
(Philippines: Rural Roads Loan)

2059
Pink

Pursuant to the authority vested in me as Administrator, Agency for International Development ("A.I.D."), by the Foreign Assistance Act of 1961, as amended, (the "Act") and the Delegations of Authority issued thereunder, I hereby authorize the establishment of a loan pursuant to Part I, Chapter I, Section 103 and Chapter 2, Title I the Development Loan Fund, to the Government of the Republic of the Philippines ("Borrower") acting through the National Economic Development Authority of not to exceed Fifteen Million Dollars (\$15,000,000). The proceeds of this loan will be used to reimburse the Borrower for up to seventy-five percent of the peso costs of a program of subprojects executed by participating Provinces to construct or improve approximately 750 kilometers of rural roads and 2400 linear meters of related bridges in provincial areas of the Philippines. The loan shall be subject to the following terms and conditions:

1. Interest Rate and Terms of Repayments

The loan shall be repaid by the Borrower within forty (40) years after the date of the first disbursement under the loan, including a grace period of not to exceed ten (10) years. The interest on the unrepaid principal balance of the loan shall be from the date of first disbursement at the rate of (a) two percent (2%) per annum during the grace period, and (b) three percent (3%) per annum thereafter.

2. Currency of Repayment

Provision shall be made for repayment of the loan and payment of interest in United States dollars.

3. Other Terms and Conditions

Unless A.I.D. otherwise agrees in writing,

(a) Goods and services financed under the loan shall have their source and origin in the Philippines.

(b) The loan agreement shall provide that prior to the commencement of the first subproject, the Borrower shall submit or cause to be submitted, the following in form and substance satisfactory to A.I.D.:

- (1) Written assurance from the Borrower that sufficient funds from the Presidential Discretionary Fund will be made available to the Department of Local Government and Community Development ("DLGCD") for the purpose of reimbursing each participating Province for the agreed amount with respect to a satisfactorily completed subproject.
- (2) A project implementation agreement, the terms of which cannot thereafter be materially modified or amended without the prior written consent of A.I.D., which project implementation agreement will be executed by DLGCD and each participating Province. This agreement shall contain, inter alia, the qualification criteria for each Province and subproject and a provision requiring, under appropriate circumstances, A.I.D. approval of construction and procurement contracts and firms selected to perform these services.
- (3) A copy of an executed contract or contracts with an engineering firm or firms satisfactory to A.I.D.
- (4) Written assurances from the Borrower and the Bureau of Public Highways, that all roads and bridges improved or constructed under this Project will be classified as provincial roads and therefore eligible for annual maintenance funds, and that such funds will be provided, both in accordance with Presidential Decrees 17 and 320.

(5) A three year implementation plan prepared by DLGCD, including a projection of funds available to finance contracts with the engineering firms required under (3) above.

(6) Such other conditions as A.I.D. may deem advisable.

(c) The loan agreement shall contain the following special covenants by the Borrower:

(1) The Project will be implemented, on behalf of the Borrower, by DLGCD.

(2) The DLGCD will assure that the terms and conditions of each project implementation agreement are observed by each of the parties thereto.

(3) DLGCD will assure that Project Evaluation Procedures are implemented.

(4) Such additional covenants as A.I.D. may deem advisable.

(d) The loan agreement shall include such other terms and conditions as A.I.D. may deem advisable.

J. E. Murphy
for Daniel Parker

12/13/74
Date

Clearances:

EA/CCD: Frank Collins *[Signature]* Date 12/15/74

EA/PPB: Lawrence Marinelli *[Signature]* Date 11 Dec 74

EA/EAA: Sarah Jane Littlefield *[Signature]* Date 12-2-74

SER/PM: Sidney Brown *[Signature]* Date 12/15/74

SER/ENGR: Merten Vogel *[Signature]* Date 12/15/74

GC: Arthur Gardiner, Jr. *[Signature]* Date 12/15/74

GC/EA: Herbert Morris *[Signature]* Date 12/15/74

PPC/DPRE: Arthur Handly *[Signature]* Date 12/16/74

AA/EA: Garnett Zimmerly *[Signature]* Date 12/16/74

Man for SRT
Draft: GC/EA: SRTisa: ejs: 12/2/74

UNITED STATES GOVERNMENT

Memorandum

TO : DISTRIBUTION

DATE: October 25, 1974

FROM : Frank Collins, EA/CCD *FC*

SUBJECT: Philippines-Rural Roads (PRP)
Philippines-Rural Electrification III (PRP)
Thailand-Lam Nam Oon (PID)

We have scheduled a meeting of the East Asia Advisory Committee for Capital Assistance for 9:30 a.m., Friday, November 1, 1974, Room 609 RPC, to consider the attached Project Review Proposals (PRP) from the Philippines and the Project Identification Document (PID) from Thailand.

It is recommended that the PRPs and the PID be approved.

Your participation in this meeting is invited.

Attachments:
As stated

DISTRIBUTION:

EA/CCD, Mr. Norman Cohen
EA/CCD, Mr. A. R. Love
EA/CCD, Mr. M. M. Pehl
EA.CCD, Mr. L. W. Bond
EA/PPB, Mr. L. A. Marinelli
EA/SAA, Ms. S. J. Littlefield
EA/PHIL, Mr. D. M. Chandler
EA/TD, Dr. H. Dodge
SER/ENGR (EA), Mr. J. Sloan
GC/EA, Mr. H. Morris
PPC/DPRE, Ms. B. Clary (6)



PROJECT REVIEW PAPER

TO : East Asia Committee on Capital Assistance

FROM: EA/CCD Capital Projects Committee

SUBJ: Philippines Request for Authorization to Proceed with the Intensive Review of a Proposal for Capital Assistance to the Government of the Philippines to assist in financing development of Rural Roads. (Rural Roads - \$15.0 million)

Summary:

Borrower: Government of the Republic of the Philippines (GOP).

Implementing Agencies: Department of Local Government and Community Development (DLGCD) and Provincial Governments.

Amount of Loan: \$15.0 million

Terms: A.I.D.'s standard terms for Development Loans, i.e., repayment within 40 years including a 10-year grace period, with interest at 2% during the grace period and 3% thereafter.

Project: The project will provide for the reimbursement of up to 75% of costs for Provincial Rural Roads Development. This reimbursement will be through the Special Letter of Credit arrangement.

I. Project Description

This loan financed project is to improve/construct rural roads in those provinces which USAID and the Provincial Development Assistance Project (PDAP) have assisted in acquiring the necessary skills and equipment to construct and maintain their own rural road network. For the purposes of this project rural roads are those roads referred to as: farm to market roads, feeder roads, municipal or provincial roads. Currently with assistance from USAID and PDAP, 14 provinces are qualified to implement the project. This number is expected to expand to 18 provinces in FY 1976 and 22 provinces in FY 1977. As currently planned, the project will construct approximately 750 kilometers of farm to market roads and 2400 linear meters of bridges in the qualifying provinces over a three year period.

The project will be implemented through the Department of Local Government and Community Development (DLGCD). DLGCD is a separate department of the Government of the Philippines and is responsible for the development of local government and community development. The provincial Development Assistance Project is currently under the Development Management Staff in the Office of the President, but is scheduled to be phased into DLGCD, during the next two years. Construction will be initially financed totally by provincial funds. Upon completion of construction, according to standards and cost previously agreed to by USAID/PDAP/DLGCD, DLGCD will

reimburse the province for an amount not to exceed 75% of the total estimated and previously agreed upon cost. USAID will reimburse the GOP an equivalent amount of \$U.S. by a Special Letter of Credit in a U.S. bank from loan funds for disbursement by the GOP.

II. Selection Criteria

To qualify for financing under this project a province must:

- (a) have been in the PDAP program for at least two years, which is considered the minimum period necessary to fully develop the management and engineering capability to properly implement the construction program.
- (b) have a provincial development staff capable of conducting feasibility-type/criteria studies for sub-project planning, selection and evaluation.
- (c) have a Capital Improvement Program (See Attachment #2).
- (d) have a Road Network Program (See Attachment #2).
- (e) have a functional Materials Testing Laboratory.
- (f) have a Provincial Engineer's Office qualified to handle all aspects of implementation (design, construction, contracting).
- (g) have a functional Provincial Equipment Pool with a deadline rate under 25%.
- (h) have an Agriculture Section Inventory and Profile (See Attachment #2).

Further, for a particular road segment to qualify for financing under this project it must:

- (a) average at least 10 farms of less than 3 hectares within its influence area per kilometer of length. (Note: the exact specification of this criteria must yet be determined).
- (b) must not lead to a dead-end or impassable road at both ends.
- (c) must lead to or connect to a road network that leads to a poblacion (rural urban center, market place).

(d) satisfy specified economic and technical criteria. DLGCD, with the concurrence of the USAID Provincial Development staff, will certify that each province and each sub-project meets the criteria listed above before authorizing a province to undertake preparation of final plans and specifications. DLGCD will contract with local A & E firms to provide independent monitoring of the design and construction and provide a certification that work was completed as agreed for purposes of reimbursement.

III. Project Cost

It is estimated that a \$15 million loan (U.S. \$ = P6.66 or \$15 million = P100 million) will be sufficient to reimburse the GOP 75% of total cost for the improvement/construction of 750 kilometers of roads and 2400 linear meters of bridges. Depending upon the design standard it is now estimated that the cost per kilometer of road will range from P50,000 (\$7500) to P200,000 (\$30,000) and the cost per linear meter of bridges improvement/construction will range from P3,000 (\$450) to P15,000 (\$2,250). The mix of road to bridges may change as individual provincial plans are completed. Funds will be allocated to the province as shown in Attachment #1. The planned allocation of funds was based upon past performance of the provinces in implementing the 1972 flood rehabilitation project and in consideration of the province's ability to initially finance the project. The total project cost in pesos is estimated at P135 million with P100 million equivalent to be reimbursed by the loan of P35 million to be provided by the province.

The total loan funds will be disbursed over a three year period.

ROADS - KILOMETERS X REIMBURSABLE COSTS (P000's)

Standard	Year - 1		Year - 2		Year - 3	
	P	x Km	P	x Km	P	x KM
Low	50	x 130 = 6,500	55	x 150 = 8,250	60.5	x 170 = 10,285
Medium	100	x 40 = 4,000	110	x 50 = 5,500	121.5	x 60 = 7,290
High	200	x 37 = <u>7,400</u>	220	x 51 = <u>11,220</u>	242	x 55 = <u>13,310</u>
Totals		17,900		24,970		30,885

BRIDGES - METER X REIMBURSABLE COSTS (P000's)

	Year - 1		Year - 2		Year - 3	
	P	x LM	P	x LM	P	x LM
Concrete	15	x 350 = 5,250	18	x 400 = 7,200	21.60	x 450 = 9,720
Lumber	3	x 300 = <u>900</u>	3.5	x 400 = <u>1,400</u>	4	x 500 = <u>2,000</u>
		6,150		8,600		11,720

Note: Reimbursable construction costs per kilometer of road for the lowest design standard road is estimated to be approximately P50,000, P100,000 for the medium designed road and P200,000 for the highest designed road. Road costs are increased 10% in the second and third years to allow for escalation. For planning purposes, it is estimated that the total project kilometers of roads will be constructed over the three years as shown on the above table. It is also planned that the construction of 2400 linear meters of bridges will be spread over three years as shown on the above table. Bridge costs were escalated about 20% in the second and third years because of the use of large quantities of steel, cement and lumber.

IV. Current Situation

In general, the Philippines has a dry season and a wet season.

The wet season lasts for about six months out of the year and during this season most barrio roads (rural roads) are impassable.

This is true even for the province of Bulacan, one of the most

developed provinces just north of Manila. During this wet season two thirds of the rice crop is harvested. Adequate farm to market roads are needed to: help the small farmers to move his produce to storage or market facilities during the "sellers market" periods; help extension workers get in the area to help farmers; permit the visits of government workers, social workers and doctors; generally to facilitate the two way movement of goods and services and, thereby, to improve the quality of rural life.

In addition to this proposed project the IBRD is providing \$5 million for rural roads to support a major national highway program in Luzon, also financed by the IBRD. The Asian Development Bank also has become interested in rural roads and is considering a road project in Mindanao and smaller projects in Mindoro and other parts of the Philippines. The Government of Australia financed provincial roads in Mindanao. However, these foreign financed road projects are more truck routes rather than rural roads.

The development of the national highway system is essential and understandably a top priority of the national government. It is the upgrading of the national system which will support the development of a rural road linkage to be assisted by the proposed loan. The following major projects are in various stages of implementation throughout the Philippines: the Japanese/Philippines Friendship Highway which is to traverse the full length of the Philippines, the IBRD national highway project in Central Luzon (\$69 million), another IBRD project in Mindanao and an ADB project in Mindanao.

V. PDAP Background

In 1968 PDAP was created to replace "Operation Spread". Operation Spread was a very successful joint GOP/USAID program initiated to support agricultural production in two provinces and USAID dealt directly with these provinces in identifying and providing inputs. PDAP was created to work closely with the National Economic Council (NEC) to improve the quality of rural life by accelerating and supporting development in agriculture, infrastructure, tax administration, field management, family planning and nutrition in selected provinces. PDAP's working relationship with NEC was transferred to the Office of the Executive Secretary to the President in December, 1970. It is now planned to phase PDAP into DLGCD where they will continue systems development and pilot installation operations leading to improved local government management systems on a nationwide basis.

PDAP/USAID is continuing to focus on assisting provincial governments through the PDAP projects. This is being accomplished by providing (1) technical assistance in comprehensive planning, fiscal resources development, through vertical and horizontal communication process; (2) providing commodity assistance for the Provincial Development Staff (PDS) operations, equipment pool operations; (3) and funding assistance for the Special Infrastructure Program (SIP) (See Attachment #2).

VI. PDAP Provinces' General Capabilities

The USAID Assistant Director for Provincial Development (AD/PD) has a staff of 16 direct hire and two PASA technical personnel

assisting thirty (30) GOP/PDAP technical personnel in attaining the overall objectives of this program. USAID is confident that the qualified PDAP provinces are developed to the point where they can implement this project without additional foreign assistance.

The PDAP project provinces are chosen primarily because of their expressed willingness to accept and utilize technical assistance to improve their management capabilities. In general, they are the more progressive provinces, important agriculturally, and are not the most economically underdeveloped. One of the outputs from successful implementation of this proposed feeder road loan project could be the expansion of ^e the whole PDAP philosophy to many other provinces. This is evidenced by the fact that the number of participating provinces is continually expanding and expected to expand during the next two years. The fourteen provinces selected to initially participate in the proposed rural roads program have demonstrated their abilities to effectively attain PDAP/USAID major objectives of fiscal management and infrastructure development. Eight of the fourteen provinces participated in the Flood Rehabilitation Program in which they gained invaluable experience in road and bridge design, project planning and administration, contract administration, quality control and equipment pool support for force account construction operations. The other six provinces are now participating in the SIP, thereby gaining the same valuable experience.

*Advice
Korant*

VII. PDAP Provinces' Engineering Capabilities

The Provincial Engineering Offices (PDO's) were established in

1968, in order to provide the newly responsible local government authority for development and maintenance of local infrastructure with operational capabilities. The PEO's were initially staffed by personnel transferred from the Bureau of Public Highways, the national organization then responsible for maintenance of existing roads, bridges, communal irrigation systems and provincial buildings. Specific USAID inputs have included excess property heavy construction equipment allocations to the PEO's. Perhaps more important than the provision of such physical equipment has been the training programs sponsored by USAID/PDAP to develop skills in all phases of equipment pool management and operations. The following elements were a part of this program: Five Year Capital Improvements Programs, Equipment Pool Development Programs, Development of Equipment Pool Operations Manuals, a Quality Control Development Plans with a Quality Control Operations Manuals, Provincial Road Network Development Plans, Provincial Action Budgets oriented toward development and joint PDAP/Province Work Plans. Success of these programs has led to the creation of a similar program, the Special Infrastructure Program, which involved six other PDAP provinces. These programs have provided a valuable proving grounds for testing and improving the capabilities of the PEO's in provincial program management. The combined staffs of all 14 PEO's include 173 graduate engineers of which 125 are civil engineers and 21 are mechanical engineers (Equipment Pool Supervisors). The remaining 27 are quality control specialists and chemical engineers trained in the management and operation of materials testing and construction quality control facilities.

Ten of the 14 PEO's have fully equipped operational construction materials testing laboratories and the remainder have placed orders for equipment and should be operational before start of this rural road program. Each PEO staff includes at least two qualified quality control laboratory technicians with a combined total of 44 in the 14 provinces. The Quality Control Division of each PEO includes an inspection section to monitor construction methods and practices, a materials quality control laboratory and a survey section for horizontal and vertical controls. The fourteen PEO's have received a ten week equipment pool training program involving training in equipment pool operations and in equipment operations and maintenance. This training is afforded by a team of PDAP/USAID equipment specialist and in accordance with the present schedule will be completed in the remaining provinces by March, 1975.

A combined total of 42 persons from the PDS-PEO staffs have received seminar training on data collection and assimilation for, and preparation of a provincial Road Network Development Plan. With this background of training and operational development programs plus the seminar planned in transport socio-economic analysis, the PDAP provinces will be capable of successfully carrying out this proposed rural road program.

PDAP will directly monitor the Provincial activities under the proposed rural road program with a staff of 30 professional personnel. This staff includes 5 Area Specialists trained in Public Administration and 10 engineers who will assist the

provincial activities in road design, cost estimating and construction of projects. Personnel available to assist provinces in specific problem areas include equipment specialists to assist in upgrading the PEO Equipment Pool operations, personnel and administration Specialists, fiscal management specialist and training specialists. A professional economist has been detailed from DLGCD to PDAP to work specifically on the sub-project economic justification methodology.

VIII. Economic Justification

The two traditional economic methodologies applicable to road projects will be used. They are the benefit methodology applicable to penetration roads into new areas (net incremental agricultural output) and the other to road improvement that reduce transport costs (savings in user costs). Social benefits which, however, are unlikely to be quantifiable, may also contribute to the road improvement justification, especially for the health and education sectors will be reviewed and discussed in the benefit/cost analysis when applicable.

Preliminary meetings with PDAP personnel have indicated that they are familiar with these transport economic methodologies and have begun the preparation of several illustrative examples for actual road segments. The purpose of this PDAP exercise is to test the availability of existing information and the requirements for additional information to meet the economic analytical test. PDAP believes that with the work already done on land use, road network inventories and crop yield measurements plus the vehicle operating cost information generated by numerous IBRD and BFW studies, a

substantial data base is available. During CAP preparation USAID will be working closely with PDAP to define the extent of available information, its quality and the need for additional data. To facilitate this effort, USAID is endeavoring to recruit an experienced transportation economist to work with PDAP to refine the methodology, review available information, assist in developing the forms and/or instructions to be used, evaluate PDAP analytical capability and determine the the technical training that should be undertaken during project implementation.

IX. Implementation

The Department of Local Government and Community Development (DLGCD) is the government organization responsible for overall implementation of this project. Individual provinces will be responsible for constructing the projects and for continued maintenance. The steps in the project implementation process contemplated at present are as follows:

1. The participating provinces will submit their Provincial Road Network Development Plan to DLGCD for review and approval. Upon approval the province will identify those rural roads that it wishes to construct/improve under this project. This selection will be based upon defined criteria and a feasibility study. *↖ Socio-economic criteria*
2. When DLGCD and USAID agree on the list of sub-projects to be implemented under this program, the province will allocate the total estimated cost of the approved projects to be implemented during the current fiscal year. The total combined amount of all

What criteria?

provinces allocated over a three year period will not exceed the allocation budget attached to this RF

3. The individual provinces will proceed to construct the roads. In most cases the provinces will use force accounts for roads and contractors for bridges. This has generally been the procedure used under the flood rehabilitation program.
4. It shall be the responsibility of DLGCD to contract with a local A & E firm to monitor construction and to certify satisfactory completion. As roads are certified as completed according to the agreed plans and specifications, AID will reimburse the GOP for an amount not to exceed 75% of the previously agreed estimated cost of the road by crediting a Special Letter of Credit (SLC) in the U.S. for U.S. procurement. In actual practice, AID will probably credit the SLC on a quarterly basis, depending upon the speed of project implementation.

X. Problems and Issues

It now appears that a project can readily be developed based upon the positive USAID experience with the PDAP provinces. There is considerable capability in PDAP and chances for successful project implementation are excellent. While there are no major issues and problems that must be resolved before this project can commence the PDAP and USAID are continuing their efforts along several lines:

1. The sub-project economic justification methodology is being refined and training will be provided PEO-PDS's.
2. The design standards currently in use in the Philippines are adopted from those used by the U.S. Bureau of Public Highways. Adoption of these standards to rural roads with an average daily traffic (ADT) below 100 might result

in over designed roads. These standards will be discussed with the GOP and revised, as appropriate.

3. It is the responsibility of DLGCD to contract with local A & E firms to monitor the design and construction of the sub-projects. The degrees and type of monitoring will be specified in the CAP and the method of reporting and assurance of funds to contract for services.
4. Republic Act 917, amended by Presidential Decree-17 and PD-320 now provides for maintenance funds for all provincial roads approved by the Bureau of Public Highways. The procedure requires the province and the national government to share the cost of P3375 per kilometer of road. Assurance will be obtained that the Bureau of Public Highway will readily approve roads proposed under this project and that maintenance funds will be budgeted and provided.

CD:AJT:mm
8/28/74

TENTATIVE ESTIMATE
FIXED COST REIMBURSEMENT FOR COMPLETED PROJECTS
(P million)

PROVINCE	FY 76	FY 77	FY 78	TOTAL
La Union	P 1.0	P 1.0	P 1.5	P 3.0
Pangasinan	2.0	2.0	2.5	6.0
Zambales	1.0	1.5	1.5	4.0
Bataan	1.0	1.5	1.5	4.0
Pampanga	3.5	4.0	4.5	12.0
Bulacan	3.5	4.0	4.5	12.0
Batangas	1.0	1.0	1.5	4.0
Camarines Sur	1.0	2.0	2.0	5.0
Albay	*	*	1.0	1.0
Sorsogon	*	1.0	1.0	2.0
Mindoro Or.	1.0	1.0	1.0	3.0
Aklan	*	*	1.0	1.0
Capiz	*	1.0	1.0	2.0
Antique	*	1.0	1.0	2.0
Iloilo	1.0	1.0	2.0	4.0
Samar	*	*	1.0	1.0
Misamis Or.	2.0	2.5	2.5	7.0
Agusan Norte	*	*	1.0	1.0
Lanao Sur	*	1.0	1.0	2.0
So. Cotabato	2.5	3.0	3.5	9.0
Davao (Norte)	2.5	3.0	3.5	9.0
Palawan	1.0	1.5	1.5	4.0
TOTAL	P 24.0	P 33.5	P 42.5	P 100.0

DEFINITIONS

- PDAP - Provincial Development Assistance Project
- DLGCD - Department of Local Government and Community Development
- NEDA - National Economic Development Authority
- P E O - Provincial Engineering Office
- ADPD - Assistance Director Provincial Development
- G O P - Government of the Philippines
- P D S - Provincial Development Staff

Capital Improvement Program - a comprehensive five year listing of major public improvement projects in a proposed priority, time and funding frame.

Provincial Road Network Development Plan - a comprehensive inventory of existing roads of all classes and projections of road requirements for the future, construction schedules, funding, and supporting geological, geographical and socio-economic data.

Agriculture Section Inventory and Profile - a description of the magnitude, nature, and supporting resources of the agricultural sector.

Special Infrastructure Project - a project under an agreed reimbursement to participating provinces for approved infrastructure projects completed according to agreed plans and specifications.

Philippines Rural Roads Issues

1. The objectives of the proposed project loan need to be set forth in detail. As stated in the IRR, they are to build feeder roads, not provincial institutional development or increased agricultural production. There is no basis by which this project might be evaluated, other than so many kilometers of road and linear meters of bridge built.

The project is presented as a general rural development activity, but lacks sufficient information and data about its real impact on the agricultural sector, which should be one of its primary objectives. The IRR is phrased too much in terms of PDAP/Public Administration concerns and not enough in terms of what and how this project will actually help increase agricultural production and improve small farmer income.

2. There should be an interlinkage with irrigation systems and development. The CAP needs to include evidence that agricultural agencies at the national level and their representation in the field are synchronized to these agriculture development plans prepared in the provinces (i.e. National Agricultural Program, not simply provincial agricultural aspirations should be a factor in selection of road sites). There is also a need to assess stated priorities as to what constitutes a major agricultural province.

3. The tentative selection criteria in the IRR do not mention any aspect of the land reform problem. Should not land tenure arrangements be included as a significant selection criterion?

The basis for the tentative allocation of funds in the IRR (Attachment No. 2) is presumed technical-administrative capability-not need. Secondly the PDAP provinces are probably the more economically developed ones in the Philippines. Unless the selection criteria are more precisely stated, there is no basis to show how this loan matches with the AID Congressional mandate for increased social equity.

4. Who is currently building feeder roads? IRR describes Provincial Government role currently as maintenance. Are they building roads or is national government? Will this program be in addition to existing program or will it replace it? It can be questioned if this loan is a substitute for the GOP's own provincial road budget. The size of any current program should be detailed, and how this project can directly benefit the extension of feeder roads development or improve an existing program carefully explained.

5. Why use a catch all term of "rural roads" if we are really talking about barrio roads i.e. non-national, provincial, or municipal roads - and if so should any segments of such "high class roads" be excluded?

The IRR gives a range of costs per kilometer of road and per linear meter of bridges which suggests different types of roads. Types of roads and where they might be located (provincially and topographically) should be specified so a reasonable judgement as to estimated cost can be made.

6. In the early 60's the Philippines had a reasonably successful self help road program wherein rural people provided labor. The lacking element was consistent access to heavy equipment for segments of the work and technical

assistance from Public Works. Since these problems are now "solved" (sic) why not involve people who will use these roads?

7. The IRR states that the DLGCD will have the responsibility to contract with local A & E firms to monitor road construction and certify satisfactory completion. While there are competent A & E firms in the Philippines, there is a need to specify A & E capabilities as it relates to their ability to take on the workload. The relationship of the DLGCD to the A & E firms should also be detailed, i.e., how will DLGCD monitor the monitors?

8. What are the goals, purposes, inputs and outputs? If there are any substantial "development administration" purposes or innovations they might as well be highlighted. Also, estimates of transport cost reduction, agricultural changes, social changes, etc. should be included.

selection criteria