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Redirection of the Upland Access Component
Rainfed Resources Development Project

Prepared for USAID-Manila

September 4, 1987

EXECUTIVE SUMMARY

General

This summarizes the report, Redirection of the Upland Access Component of the Rainfed Resources Development Project, prepared for USAID, Manila by the International Science and Technology Institute, Inc. dated September 4, 1987.

The Upland Access Component (the Project) of the Rainfed Resources Development Project was approved on August 24, 1984, with a projected five-year project life, and a PACD of September 1989. Its focus is the labor-based construction of upland access roads, trails and bridges. It has an approved total cost of $4.1 million, $3.0 million from AID and $1.1 million as the host-country contribution. The AID contribution was initially a combination of loan and grant funds, but it has since been changed to all grant funding.

Current Project Status

The Project is behind schedule, and it will not meet its physical or financial targets. About 63 percent of the targeted road kilometer will be built, and trail improvements and footbridge construction will not be significant. Budgeted equipment ($500,000) has not been procured and should not be. Spending will reach about one-third of planned levels. However, the project:

- Will achieve all of its non-physical outputs, its purpose and its subgoals;

- Is generating employment an average of about 4,000 person days per km., as compared to 485 for equipment. And, this work is going to upland residents, who are largely un-or under employed;

- Has been successful in community organization, as evidenced by worked satisfaction, and the fact that actual productivity is substantially exceeding the norms that ILO set for the Philippines in 1983; and

- Has established, most importantly, a system for the identification, design and construction of upland access projects by labor based methods that is unique to the Philippines. This is especially important given the present Government's emphasis on labor based construction. (Our analysis indicates that the cost of labor basic construction is financially competitive with, and probably cheaper, than equipment-based work. In economic terms, equipment methods cost about 33 percent more.)

Possible Redesign

Previous consultants and Mission staff have proposed a redesign which would expand the Project to include the rehabilitation and maintenance of provincial roads in four or five of the existing Project provinces. Principal reasons for the expansion are:

- The national recognition of the economic and social value of labor based construction;

- The need to strengthen the long-term institutional base of the Project-created Upland Access Unit in the Department of Local Government as a DLG locus for labor based methodology;

- The apparent need for provincial road rehabilitation and improved, cost effective, maintenance;

- The opportunity to capitalize on what has been achieved so far and to pave the way for possible future projects; and

- The ability of the Project to absorb the expansion.

The report supports such a Project expansion and proposes that it include the labor-based rehabilitation and maintenance (for two years) of 150 kms of provincial roads, in addition to the completion of the currently approved, pending and identified upland access projects. The report identifies nine sequential steps in such an expansion effort. The first is a decision by USAID and the DLG to proceed with redesign work, recognizing that the Project would have to be extended two years. (USAID will also have to determine that an expansion will fit within the overall project's upland-oriented goal.)

The report also analyzes the current status of funding and recommends a revised financial plan for the expanded project which would not require additional AID funds, but would require a 16 percent increase in the GOP contribution.

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INTRODUCTION

General

This report on the Upland Access Component of the Rainfed Resources Development Project is submitted in fulfillment of Purchase Order No. AID 492-0249-0-00-7090, issued by the Contract Services Division, USAID Manila to the International Science and Technology Institute, Inc. The underlying analysis and the report were done by ISTI Senior Associate, William R. Thomas 3d during the period August 10 to September 4, 1987. In conducting this work, the Contractor has been materially assisted by members of the staff of USAID, Manila, the Upland Access Unit of the Department of Local Government and two long-term AID-financed consultants to the Project.

In keeping with the Scope of Work, this study has also drawn heavily on existing studies, reports and Memorandums. A selected bibliography of these documents is attached as Annex B.

Scope of Work

The full scope of work for the contract is attached as Annex A. The scope of work identifies eight tasks to be completed in order to fulfill the contract. The tasks are all to be based on available information, and all but one are the subject of a separate chapter in this report. Briefly, the eight tasks are:

- To evaluate the existing UAC framework, including the Upland Access Unit, the status of projects, the effectiveness of implementation, the labor-based capacity that has been created, and community participation.

- To discuss labor-based productivity and output, including cost comparisons, employment generation, productivity and supervision and management problems.

- To describe the Department of Local Government reorganization in relationship to the Upland Access Unit. (The reorganization is still being prepared. It is to be issued no later than November 21, 1987. What little that is known about it is presented in Chapter I.)

- To describe the present provincial [road] maintenance system.

- To summarize available information on the lengthman system of road maintenance, including how it works and what would be involved in introducing it into this project.

- To realign the UAC budget to suggest a revised financial plan which would include a mix of upland and provincial rehabilitation and maintenance projects.

- To discuss existing labor-based work in the Philippines, including the UNDP/ILO Central Labor-Based Advisory and Training Team.

- Based on the above, to determine what further feasibility work, if any must still be carried out in order to implement a revised project.

I. THE EXISTING PROJECT

A. BACKGROUND

The Upland Access Component (the Project) of the Rainfed Resources Development Project was approved on August 24, 1984, with a projected five-year project life, and a PACD of September 1989. It has an approved total cost of $4.1 million, $3.0 million from AID and $1.1 million as the host-country contribution. The AID contribution was initially a combination of loan and grant funds, but it has since been changed to all grant funding.

The project goal, purpose and expected outputs are presented in the following subsections, together with a brief summary statement of the status of each item.

1. The Project Goal

The goal of this component is essentially the same as that of the larger RRD project goal; i.e., ACHIEVEMENT BY THE RURAL POOR OF THE HIGHEST SUSTAINABLE PRODUCTIVITY FROM THE RAINFED AND COASTAL RESOURCES UPON WHICH THEY DEPEND FOR THEIR LIVELIHOOD. (It is too early to know whether or not the goal will be achieved. However, baseline information in the form of household surveys is being collected for each subproject. Through repeat surveys it should be possible to quantify goal achievement at the end of the project.)

The specific subgoals are:

- To increase rural employment and improve access to other government and non-government services. (The subprojects themselves are providing substantial employment, and access to services will be improved when subprojects are completed. Further employment increases and the extent of service improvement will only be known when the follow-on surveys are completed.)

- To accomplish these objectives the Upland Access component of the RRD will develop organizational, management and control systems for local government units to effectively implement labor-based construction of upland minor access roads, trails and footbridges. (It is important to note that this subgoal has essentially been achieved. Organizational, management and control systems have been developed and are functioning. They are, in part, upland specific and they can undoubtedly be improved, but, taken together, they constitute the only established documented overall system for road subproject selection and construction by labor-based methods that exists in the Philippines.)

  The resulting overall system can serve as a model for other organizations and adopted from other purposes. It deserves to be supported and encouraged.

2. The Project Purpose

The purpose of this component is: TO TEST THE FEASIBILITY OF ADDRESSING UPLAND ACCESS CONSTRAINTS BY STRENGTHENING PROVINCIAL CAPABILITIES TO ASSIST RURAL BARANGAYS TO PLAN AND UNDERTAKE THE CONSTRUCTION AND MAINTENANCE OF UPLAND MINOR ROADS, TRIALS, AND FOOT BRIDGES USING EQUIPMENT-SUPPORTED, LABOR-BASED TECHNOLOGY. (This is being tested and demonstrated in the present subprojects.)

3. EXPECTED PROJECT OUTPUTS

By the end of this activity in September, 1989, the Project is expected to:

- Train selected members of the Provincial Engineering Offices of six to nine provinces in the planning and implementation of community managed small-scale rural infrastructure projects utilizing labor-intensive construction and technology. (Formal training courses have been conducted covering six subject areas and informal training is continuing, primarily through field visits by the Upland Access staff and the two local consultants to the Project. There is one caveat here, however. The subprojects are not "community managed", they are managed by the Provincial Engineering Offices.

- Develop manuals and other documents detailing processes, procedures, and/or systems for national replication. (These have been developed.)

- Augment the provincial construction and maintenance equipment pool with a small spread of equipment and hand tools particularly suited for the support of labor-based construction methodologists. (Equipment has not been purchased, and the need for much of it is in question. Hand tools are being procured.)

- Construct approximately 150 kilometers of upland minor access roads, 150 kilometers of graded trails and 30 foot bridges. (These quantitative targets will not be met.)

- Develop a maintenance plan which places primary responsibility on the community. (A maintenance manual has been published which is based on community participation.)

- Develop an environmental action plan. (A plan has been developed and is being implemented.)

B. THE UPLAND ACCESS UNIT

1. Organizational Location

The Upland Access Unit (UAU) was originally established as a separate unit under the Barangay Roads Development Program in the Department (then the Ministry) of Local Government (DLG). After responsibility for barangay roads was returned to the Department of Highways and

Public Works (DPWH), the UAU was established as a separate unit and the Unit Head was designated as Deputy Director of the Upland Access Program. The Director, who reports to the Assistant Secretary of DLG, is also Director of the Rural Roads Program, the Barangay Water Program and the residual Barangay Roads Development Program. However, Executive Order No. 262, approved by President Aquino on July 25, 1987 has reorganized the Department and created an Office of Project Development Services, and the Upland Access Unit will become a part of that Office. The details of the organization of the Office are still being prepared, but apparently the UAU will be a free standing unit within the office. As such UAU will be positioned to become a broader labor-based construction coordinating unit within the DLG. A potential first step in the direction is the recent nomination of a UAU staff member to serve as the DLG representative to the Combined Labor-Based Advisory Training Team.

2. Organization and Staffing

The UAU is organized into the three sections - a technical (i.e. Engineering) Section, a Socio-Economic Section and a Support Services Section. Each has a Section Head, who also serves an action officer. The overall Deputy Head of the Unit also serves as technical officer for two provinces. The staffing status of the Unit is shown in Table I-1. In summary, it has an authorized strength of 21, and an actual current staff of 18. The Unit has no clerical staff, and professionals frequently do their own typing.

All of the authorized positions in the Unit are contract positions, but the position of Unit Head will apparently be changed to a permanent DLG position as part of the pending reorganization. The remaining positions will remain contract positions because of the difficulty of recruiting qualified personnel at current Government salary rates.

Table I-1
Staff of the Upland Access Unit

Position	Number Authorized	Vacant	Away on Detail	On Loan To Unit	Actual Current Staff
Unit Head	1				1
Deputy	1				1
Section Chiefs	3				3
Engineering Staff	8	2	3	2	5
Socio Economic Staff	3	1	-	2	4
Support Staff	5	-	1	-	4
	21	3	4	4	18

3. Capabilities

Any assessment in this report of the capabilities of the staff of the Upland Access Unit must necessarily be very subjective. However, the

overriding characteristic of the staff of the Unit is that they are relatively young and relatively inexperienced. This has apparently been a two-edged sword. On the one hand, the staff lacks the experience that would be desirable to enable it to fully perform some of its functions. For example, the technical staff has apparently been reluctant or unable to provide the amount of on-site technical guidance that might be desired, and most of this responsibility has fallen on the Engineering Advisors.

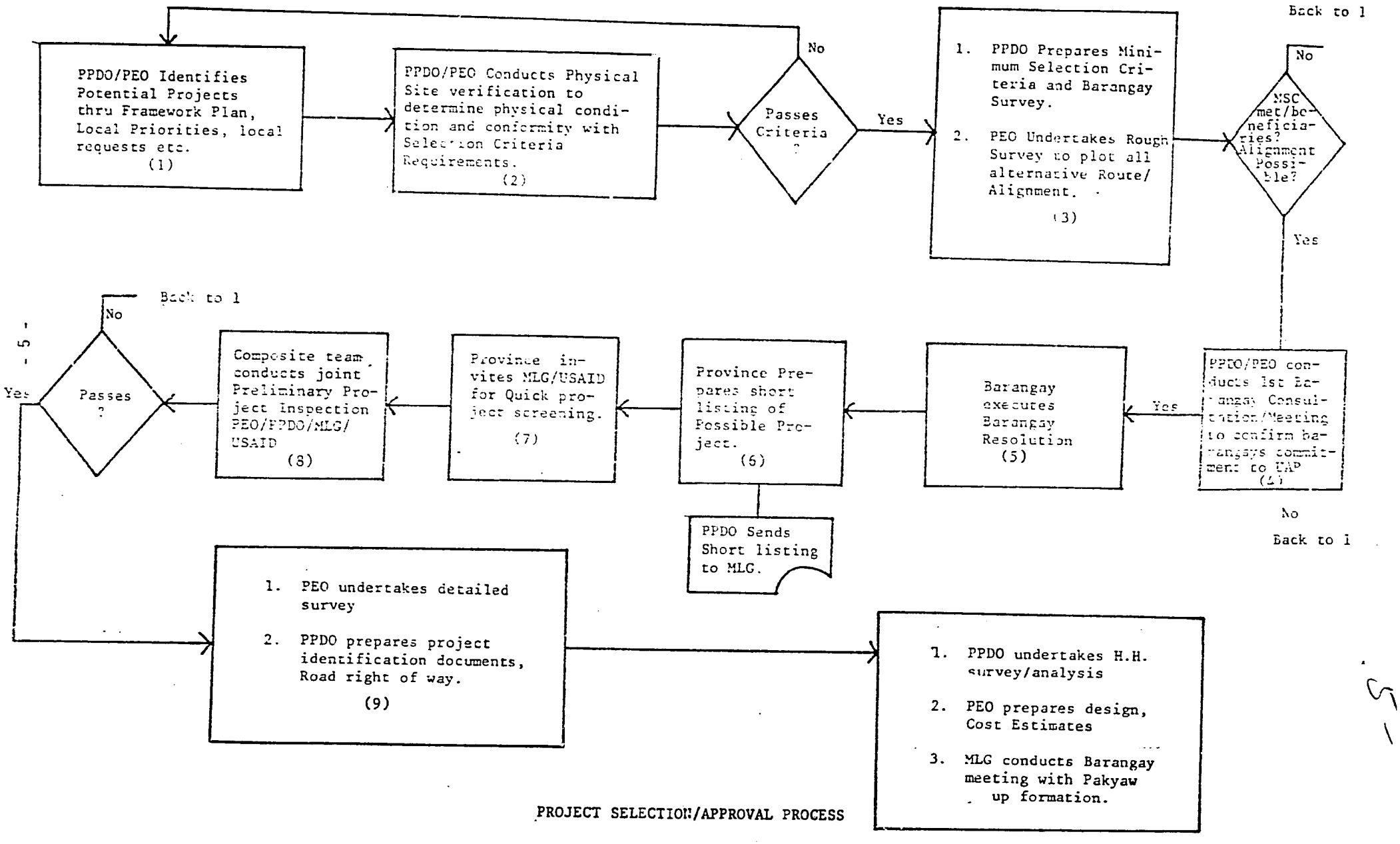
On the other hand, because the Unit is new and the staff young, they have not been set in their ways. Because they have not been burdened by systems and experience geared to equipment-based construction, they have been willing to press forward with a labor-based construction methodology. And, much has been accomplished in a relatively short period of time. As noted above, a system has been created for the identification, evaluation, design, review and approval, and construction of labor-based upland access projects. And it is functioning.

C. PROJECT STATUS

1. Overall Accomplishments

In addition to the actual subprojects, discussed in Section 2 below, the project has accomplished the following:

- The creation and staffing of the Upland Access Unit
- The design and implementation of an overall system for subproject identification, with appropriate procedures and forms. This system is presented schematically in Figure I-1.
- The preparation and publication of five handbooks covering:
  - -- Planning and Implementation Procedures
  - -- Prefeasibility Assessment and Environmental Assessment
  - -- Accounting, Budgeting and Cost Standards
  - -- Pakyaw Contract Procedures
  - -- Maintenance
- The conduct of seminars and training courses covering the following subject areas:
  - -- Orientation of senior provincial officials,
  - -- Framework (i.e., overall) planning,
  - -- Socioeconomic surveys,
  - -- Subproject surveying, planning and programming,



PROJECT SELECTION/APPROVAL PROCESS

-- Site supervision, and

-- Community participation.

- The formal issuance of implementation procedures as Memorandum Circular No. 87-26, issued by the Secretary of the Department of Local Government

- The development, in coordination with other agencies, of a system for fund releases to the provinces.

- The specification and procurement of handtools for approved subprojects.

These accomplishments are significant, but it would be wrong to leave the impression that they are perfected or free of problems. Take, for example, the Framework Plans. These plans are not intended to be comprehensive upland access plans for each province. Rather, they are designed to identify a short list of priority projects to provide the framework for project selection. The concept is relatively simple, but the resulting plans vary widely in quality. At the most they are merely a compilation of project statistics with an unrelated list of proposed projects. At the best, project criteria are used to form an analytic bridge from basic data to a tentative project list and thence to a priority ranking.

On the operational side there have been problems like lack of familiarity of PEO staff as regards preparation of quality plans, non-availability of transport for surveys, no funds for gasoline or per diems of survey parties, etc. Some improvements are being made in respect of such problems by release of some project preparation funds for surveys, etc.

Similarly, handtools have been specified and procured, but quality remains a problem, with the Government unable to enter into sole-source procurement with the only viable hand tool manufacturer. And, while fund release procedures exist, delays in release of funds have been a major cause of delays in the implementation of subprojects. (This is discussed further in Chapter V, below.)

The problems are generally known to USAID and UAU staff, and in many cases actions are underway to resolve them. The main point is that systems exists, they are functioning and they are gradually being improved. It is unrealistic to expect that there would not be implementation problems in a pilot project such as this.

2. <u>The Status of the Subprojects</u>

Table I-2 shows the status of the 19 subprojects that are currently approved or in preparation. In summary, 9 road projects in 7 provinces, with a total length of 30.8 kms. have been approved. Construction is underway on 6 of the 9 (the other 3 are awaiting release of funds) and 3 of them are well along towards completion.

Two more roads (13.8 kms) and a 3 km improved trail are under technical review in AID. In addition, plans are being prepared for 3 footbridges in Benguet and 4 additional roads with a total length of 25 kms.

The currently estimated total of direct construction costs for these projects is $893,000 compared to a total present project allocation for this purpose of $2.5 million. (See Chapter V below.)

Table I-3 shows the disposition of the 56 subprojects that have been formally proposed by the provinces since the project began. Trails are conspicuous by their virtual absence from the table. It is clear that the Project's target of 150 kms of improved trails will never be approached, let alone met. This is apparently a result of limited provincial experience and interest in trail improvement, and the fact that the need for justifiable trail improvements was overestimated in the Project design. For roads and footbridges, the conspicuous statistic is the relatively high number of subproject disapprovals. Of the 48 roads proposed by 9 provinces, 15 (31 percent) are approved or actively being prepared; the initial feasibility of 8 (17 percent) has not been verified; and 25 (52 percent) have been disapproved. If Negros Occidental and Misamis Oriental (which are effectively out of the program) are excluded, the comparable percentages are 40, 21 and 39 percent, respectively. This rejection rate of 39 percent of the roads (43 percent of the trails) proposed is very high, considering the fact that the proposed roads were a select list of the highest priority upland access roads in each of the seven active provinces.

R. Sikka in his memorandum of June 24, 1986 and his Concept Paper contended that there were limited opportunities for viable upland penetration road projects that would meet existing project criteria. In the concept paper, Sikka states that:

"It is in the area of selection of projects however that most difficulties have been felt by UAU as well as PEOs. Despite carefully worded criteria, identification of suitable projects has turned out to be a serious problem in the UAP. Detailed explanation of selection difficulties can be found elsewhere. Briefly, in some provinces it is very difficult to find viable new projects because enough roads have already been built under various programmes. Secondly, upland areas in many cases have already reasonable accessibility to main road system through carabao or foot trails within 30-45 minutes' walk. Marginal improvement in accessibility under those conditions would have little practical value. Thirdly, in general upland areas are very thinly populated. This makes it difficult to locate suitable penetration type roads which will generate reasonable traffic and quality for inclusion on the basis of economic or socio-economic cost-benefit analysis."

The high subproject rejection rate shown in Table I-3, and the reasons for subproject disapprovals support this conclusion. However, Sikka also contends that, "For a number of reasons, project selection and approval under UAP has proved to be quite arduous. Deficiencies could

TABLE 1-2

STATUS OF APPROVED AND PENDING PROJECTS - UPLAND ACCESS

PROJECT	LENGTH	TOTAL COST (000)	STARTING DATE	EXPECTED COMPLETION	PERCENT ROADS COMPLETE
APPROVED					
DAO-ES-TADAYAN, BE	2.700	854	31 MAR 87	30 OCT 87	51%
BAMBAN-BOLINTIN, ZA	5.000	1,022	6 JAN 87	30 SEP 87	74%
CUANOS-PITOGO, CE	3.260	803	23 JUN 87	30 NOV 87	5%
SAN SAN VICENTE-LEBAS, SC	2.660	600	6 OCT 86	30 SEP 87	82%
BURBULI-PACALA, OM	2.529	554	16 JUL 87	20 NOV 87	2%
BANGBANG-ARCANGHEL, AK	2.890	520	1 JUL 87	30 NOV 87	30%
UNIDOS-TAGAROROC, AK	1.640	385	FUNDS NOT RELEASED		
BULOL-DETAL FITAK, SC	2.640	899	FUNDS NOT RELEASED		
VENUS-BUENA-VISTA, ZDN	7.450	1,495	FUNDS NOT RELEASED		
SUBTOTAL - APPROVED	30.769	7,132			
UNDER REVIEW - AID					
SAN SAN JOSE-TELAFAS, SC	6.540	2,679			
PINAMAR-MARUPAY, ZDN	7.280	1,633			
SUBTOTAL - PENDING	13.820	4,312			
BEING PREPARED					
NAUGSOL-TIBAG, ZA	8.000	1,828			
CONRAZON-BURIAO, OM	8.000	1,820			
LANGKAS-NALHUB, CE	7.000	1,599			
SIBALIW ACCESS, AK	2.000	562			
SUBTOTAL - PREP	25.000	5,809			
TOTAL ROADS	69,589	16,314			
TRAILS - UNDER REVIEW					
DUMADALIG-SITIO EL-NAP, SC	3.000	430			
FOOTBRIDGES - UNDER PREP					
BANAO FOOTBRIDGE, BE	160	528			
CAYOCO FOOTBRIDGE, BE	90	289			
GAMBANG-MALAGYO FB, BE	140	449			
SUBTOTAL- FOOTBRIDGES	390	1,266			

PROVINCES: BE = BENGUET, ZA= ZAMBALES, CE = CEBU, OM = ORIENTAL MINDORO, AK = AKLAN, SC = SOUTH COTABATO and ZDN = ZAMBOANGA DEL NORTE.

Table I-3

Upland Access Project

Disposition of Subprojects - As of August 31, 1987

Number of Subprojects

Type of Subproject	Proposed	Approved	Under Review	Being Prepared	Not Verified	Disapproved
Roads Total	48	9	2	4	8	25
Roads (Excluding Misamis Oriental and Negros Occidental)	(38)	(9)	(2)	(4)	(8)	(15)
Trails	1	-	1	-	-	-
Footbridges	7	-	-	3	1	3

Reasons for Disapproval of Roads

Reason	Number of Projects	
	Total	7 Active Provinces
Too few beneficiaries	5	3
Benefits not commensurate with cost	3	-
Terrain not suitable for labor-based methods	3	1
Project taken up by another program	3	3
Peace and order problems	3	2
No connection to an equal or better road	2	1
No local interest	2	2
Would serve a mine (does not meet minimum criteria)	1	1
Low labor component	1	1
Location too remote	1	1
There is an existing road to a service area	1	-
TOTAL	25	15

be classed as institutional, operational, or due to selection criteria for the projects."

Similarly, the terms of reference of this study state that "Subproject selection criteria are too complex and need to be streamlined." But, this is not at all clear. The high subproject rejection rate, and the reasons for the rejections appear to support the point that there are a limited number of viable potential upland projects, rather than the contention that selection criteria are too ardous. Surely the project should not be approving subproject that have too few beneficiaries, are not in suitable terrain, or for which there is no local interest. It is also significant that, at the time Sikka's Concept Paper was prepared, only six road projects had been approved. In the four months since then, three additional roads have been approved, two are under review in USAID and four more are being designed. A better alternative would appear to be the suggestion in Sikka's June 1986 memo that criteria be revised to permit the inclusion of projects on the periphery of upland areas. There appear to be many instances where the construction or rehabilitation of a connecting road would be the most cost-effective way of improving access for the inhabitants of a given upland area.

3. Overall Project Status

Overall, in terms of time, the project is about one year behind schedule. The original project design provided a 20 month period for pre-operational planning, organization and training, with actual construction to start in mid-1986. If counterpart funds for equipment became available earlier, this pre-operational phase was to be reduced to 14 months. In actual practice, construction did not really start until January 1987, six months behind the original schedule, and one year behind the desired one. However, to a degree, the delays were more apparent than real. The original schedule would have missed the prime 1986 dry season construction period (Jan to mid-May), and it was missed in practice.

The number and length of subprojects in relation to the remaining available time is probably a better measure of project status, but this comparison is difficult to make for two reasons. First, the Project design did not include a forecast of physical accomplishment by year. The best one can do is to infer a rate of physical accomplishment from the forecast expenditure rates. Second, it is difficult to forecast future accomplishments based on past experience, because the Project has been on a learning curve. Future lead times from project identification to completion should be less than past ones. These limitations should be borne in mind in reviewing Table I-4. the table compares inferred planned construction with a current forecast. It is conservative in that it assumes:

- No subprojects beyond those already identified; and
- That all projects not yet tested for feasibility will not be completed until FY 1989.

It is optimistic in that it assumes that all but one of the identified subprojects will be found to be feasible and will be completed. (That one does not meet minimum project criteria.)

Table I-4

Planned vs Forecast Physical Accomplishment - By Fiscal Year

Category	Fiscal Year 1986	1987	1988	1989	Total
Roads (Km)					
Inferred Plan (By Year)	36	50	34	30	150
Inferred Plan (Cumulative)	36	86	120	150	150
Current Forecast (By Year)	0	2.7	66.9	25	94.6
" " (Cumulative)	0	2.7	69.6	94.6	94.6
Trails (Km)					
Inferred Plan (By Year)	36	50	34	30	150
Current Forecast (By Year)	-	-	3	-	3
Footbridge (#)					
Inferred Plan	7	10	7	6	30
Current Forecast	-	-	3	1	4

Table I-4 shows that the project is lagging seriously in terms of physical accomplishment. By September 30 of this year there will be insignificant progress compared to planned rates of construction. By the end of FY 88 about 55-60 percent of planned road construction will be finished. If no new projects are identified, only 63 percent of the planned roads will be built and very little trail and footbridge construction will be done.

D. COMMUNITY PARTICIPATION

Community participation is a basic tenet of the Upland Access Project. It includes the following elements:

- Local residents are involved from the very beginning of the project through community planning meetings, and a formal Barangay Resolution committing the barangay to its part of the subproject is required.

- Barangays served by a UA road are expected to contribute 5 percent of total construction costs in the form of free labor.

- Communities are expected to provide road right-of-way free. (In practice this burden falls on the individual land owners along the route.)

- Labor is to be drawn from the vicinity of the road and it is to be employed through pakyaw contracts - a traditional form of cooperative group work.

- Community facilitators are employed to orchestrate community participation.

1. The Barangay Contribution

The cost sharing agreement between AID and the Government for each project is premised on a Barangay contribution of 5 percent of total costs, and the required formal Barangay Resolution commits the barangay to provide the contribution in the form of free labor. However, the current procedures have resulted in a lesser contribution. Even that is largely illusory, and will remain so. The barangay contribution is being collected by reducing calculated pakyaw contracts by 5 percent, which works out to be about 3 percent of total costs. (The difference is apparently made up from line item savings and contingencies.) Moreover, the pakyaw workers are apparently exceeding the projects' approved production norms, and thus are earning more than the planned daily wages. As a result, the barangay contribution is in the form of extra income foregone, rather than free labor per se. This will continue as long as norms leave room for a productivity incentive, as they should. The contribution does, however, reduce total construction costs.

2. Pakyaw Contracts

Overall, the pakyaw system appears to be working very well. The members of the pakyaw groups are to be drawn from the service area of the road, in the majority of the cases this has happened. In several instances where there have been problems, they have been resolved by negotiation or executive action. The procedures for the formation of pakyaw groups provide for the groups to be formed and to then elect a group leader. Apparently this has not happened. In practice, group leaders are generally identified in meetings between the Facilitator and barangay officials. These leaders then recruit their groups. (In Benguet group leader positions were given as a form of compensation to persons who donated land for the right of way.) Although the group leaders have not been elected, the actual practice does not appear to have produced serious problems, and the outcome may not have been all that different from what would have happened through direct elections. Rural people are likely to elect persons with proven leadership ability to be group leaders and these persons are likely to already be in positions of leadership.

There is substantial evidence to date of the success of the pakyaw concept, although it comes from only three subprojects and little of it is quantitative. The latter comes from a pakyaw worker survey recently carried out on the Bamban - Bolintin road in Zambales (the only province that has surveyed workers so far.) The Zambales survey found that:

- The sample workers all live within one kilometer of the road.

- Half of the pakyaw group leaders were identified as holding official positions in the community.

- The median daily wage received was ₱67, compared to a reported prevailing daily wage of ₱30 to 49, and a standard cost rate of ₱33 per day. Workers appear to have exceeded the approved production norms by 100 percent per day, and the available productivity reports indicate that this is not the result of work days in excess of eight hours.

- Not suprisingly, 79 percent expressed satisfaction with the income they received. The principal cause of disatisfaction was delays in payment.

- Fifty-five percent of the sample reported annual incomes greater than ₱10,000, while 45 percent reported incomes of ₱3,000 per year, or less.

- Twenty-one percent of the workers (mostly single high school graduates 20-22 years of age) were unemployed in the previous year. Of those that were employed, 73 percent reported working less than eight hours per day, an indication of underemployment.

- The average worker participated in three pakyaw contracts (they are let monthly), indicating general satisfaction with the system and pay.

- All workers reported that their pakyaw leaders were appointed and that all participated in the construction work. All but one stated that the leader did not receive extra compensation.

The strongest supporting evidence for the above is the fact that workers generally have wanted to work on more than one pakyaw contract, and in some instances competition for group membership is keen. In addition, UA staff members have been systematically conducting informal interviews with pakyaw workers during their field trips. They are finding that the workers are pleased to have the work and are satisfied with the pay.

3. Community Facilitators

A relatively unique feature of the Upland Access Project is the employment of Community Facilitators. (Apparently, the National Irrigation Authority has the only other construction program that employs community organizers.) The Facilitators are DLG officers with the rank of Local Government Officers III. They are trained and experienced in community development work and are residents of the general area of the subproject. They are paid a small incentive out of Project counterpart funds. The Facilitators serve as a bridge between the Engineers who direct the subproject and the communities. They are responsible for organizing community meetings before and during the project, for organizing pakyaw groups and for identifying

and resolving community and worker grievances. The Facilitator concept is apparently working very well. They are creating a level of community awareness that is critical to subproject success, and they have defuzed a number of issues that might otherwise have become quite serious - a dispute between two communities over the division of pakyaw work, for example.

II. LABOR-BASED PRODUCTIVITY AND OUTPUT

A. COMPARATIVE COSTS

1. Financial Costs

The August 1983 ILO Study concluded that, ". . . for site clearance and earthworks activities labor-based methods are cost effective.", and R. Sikka has contended that labor-based road construction is substantially cheaper than equipment-based construction. Two cost comparisons have been prepared to test this hypothesis.* The estimates are presented in Table II-2 and II-3. Both compare the cost, by work element, of labor vs equipment for the nine approved upland access roads. In both, the approved costs for labor-based construction have been increased by adding the costs of equipment support, using the approved equipment rental rates of the DPWH. In both, certain commons costs such as a provision for contingencies have been omitted, since they apply to both equipment and labor and thus would not affect the comparison. For these reasons, the labor-based costs of the nine roads will differ from the approved total direct construction costs shown in the Tables in Chapter VII.

The equipment-based costs in Table II-2 were calculated using the average unit cost for each work element from five PRIP roads which were costed in 1985, multiplied by the actual quantities of work for each element for each road. The table shows the percentage cost differences, by work element, by road, and in total.

Table II-3 is in the same format. However, in the table the cost of equipment-based construction for each work element, for each road, has been built up using the equipment rental rates and equipment productivity rates currently approved by the DPWH for use in estimating road construction costs. The estimates are almost certainly conservative, since they assume that the equipment will work six hours a day. This allows only 25 percent of equipment time for both downtime and underutilization. The two combined are probably greater than 25 percent. (Sikka's contention that labor-based construction is cheaper was apparently based on the belief that the DPWH rental rates did not include depreciation. However, it is our understanding that depreciation is included.)

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*Much of the estimating work was done by Edgar Agana, Engineering Advisor to the UAP, and the estimates were reviewed with the UAU staff.

TABLE II-2

COST COMPARISON - EQUIPMENT BASED VS LABOR BASED CONSTRUCTION (PESOS)

UNIT OF WORK	LENGTH K.M.	CLEARING & GRUBBING HA.	EXCAVATION EMBANKMENT CU.M.	EXCAVATION WASTE CU.M.	AGGREGATE BASE COURSE CU.M.	RCCP 60MM L.M.	RCCP 90MM L.M.	RCCP SUBTOTAL	RIPRAP CU.M.	TOTAL COST	COST PER KM
EQUIP. BASED UNIT COST		7,692.05	23.62	15.09	92.07	575.92	724.35		392.12		
PROJECT											
DAC-ES-TADAYAN, BE											
QUANTITY	2.70	2.70	2,160	28,788	1,251	78	0		160		
EQUIPMENT BASED COST		20,769	51,019	434,411	115,180	44,922	0	44,922	62,739	729,039	270,015
LABOR BASED COST		22,478	45,954	354,956	155,235	31,470		31,470	57,180	667,273	247,138
% DIFFERENCE		-8%	11%	22%	-26%	43%		43%	10%	9%	
BAMBAN-BOLINTIN, ZA											
QUANTITY	5.00	5.00	4,235	42,242	2,475	36	0		27		
EQUIPMENT BASED COST		38,460	100,031	637,432	227,873	20,733	0	20,733	10,587	1,035,116	207,023
LABOR BASED COST		39,375	150,126	551,843	294,129	17,112	0	17,112	6,491	1,059,076	211,815
% DIFFERENCE		-2%	-33%	16%	-23%	21%		21%	63%	-2%	-2%
CUANOS-PITOGO, CE											
QUANTITY	3.26	3.26	3,260	30,595	1,520	48	0		165		
EQUIPMENT BASED COST		25,076	77,001	461,679	139,946	27,644	0	27,644	64,700	796,046	244,186
LABOR BASED COST		22,005	92,183	305,954	208,323	28,324	0	28,324	40,950	695,739	213,417
% DIFFERENCE		14%	-16%	51%	-33%	-2%		-2%	58%	14%	
SAN VINCENTE-LEBAS, SC											
QUANTITY	2.66	2.66	7,494	14,475	998	60	0		272		
EQUIPMENT BASED COST		20,461	177,008	218,428	91,886	34,555	0	34,555	106,657	648,995	243,983
LABOR BASED COST		22,707	225,008	176,892	99,595	28,209	0	28,209	59,224	611,733	229,975
% DIFFERENCE		-10%	-21%	23%	-8%	22%		22%	80%	6%	
BURBULI-PACALA, OM											
QUANTITY	2.53	2.53	1,904	16,872	1,252	0	84		92		
EQUIPMENT BASED COST		19,453	44,972	251,580	115,272	0	60,845	60,845	36,270	528,394	208,934
LABOR BASED COST		26,166	55,638	201,843	153,883	0	70,350	70,350	25,142	533,022	210,764
% DIFFERENCE		-26%	-19%	25%	-25%		-14%	-14%	44%	-1%	
BANGBANG-ARCANGHEL, AK											
QUANTITY	2.89	2.57	1,460	15,893	1,431	120	0		40		
EQUIPMENT BASED COST		19,769	34,485	239,901	131,752	69,110	0	69,110	15,685	510,702	176,713
LABOR BASED COST		17,061	28,343	174,286	154,550	68,646	0	68,646	7,488	450,974	156,046
% DIFFERENCE		16%	22%	37%	-15%	1%		1%	109%	13%	
UNIDOS-TAGAROC, AK											
QUANTITY	1.64	1.64	1,844	12,253	812	36	7		17		
EQUIPMENT BASED COST		12,615	43,555	184,893	74,761	20,733	5,070	25,804	6,705	348,338	212,401
LABOR BASED COST		12,815	45,595	152,784	93,296			29,229	7,925	341,644	208,320
% DIFFERENCE		-2%	-4%	21%	-20%			-12%	-15%	2%	
BULOL-DETAL FITAK, SC											
QUANTITY	2.64	2.64	5,293	34,837	1,307	105	16		170		
EQUIPMENT BASED COST		20,307	125,021	525,690	120,335	60,472	11,590	72,061	66,660	930,075	352,301
LABOR BASED COST		22,536	149,075	452,233	155,921	49,366	11,158	60,524	50,936	891,225	337,585
% DIFFERENCE		-10%	-16%	16%	-23%	22%	4%	19%	31%	4%	
VENUS-BUENA VISTA, ZDN											
QUANTITY	7.45	7.45	13,043	27,752	3,688	196	36		193		
EQUIPMENT BASED COST		57,306	308,076	418,778	339,554	112,880	26,077	138,957	75,679	1,338,349	179,644
LABOR BASED COST		58,669	337,974	441,434	418,531	116,865	32,625	149,490	43,750	1,449,848	194,610
% DIFFERENCE		-2%	-9%	-5%	-19%	-3%	-20%	-7%	73%	-8%	
TOTAL											
QUANTITY	30.77	30	40,693	223,512	14,734	679	143	0	1,137		
EQUIPMENT BASED COST		234,215	961,169	3,372,796	1,356,559	391,050	103,582	494,632	445,683	6,865,054	223,116
LABOR BASED COST		243,812	1,129,894	2,812,925	1,731,463	339,992	114,133	483,354	299,086	6,700,534	217,769
% DIFFERENCE		-4%	-15%	20%	-22%			2%	49%	2%	

*BASED ON AVERAGE COSTS OF FIVE 1985 PRIP ROADS

TABLE II-3
ALTERNATIVE COST COMPARISON - LABOR BASED VS EQUIPMENT BASED CONSTRUCTION (PESOS)

UNIT OF WORK / PROJECT	LENGTH K.M.	CLEARING & GRUBBING HA.	EXCAVATION EMBANKMENT CU.M.	EXCAVATION WASTE CU.M.	AGGREGATE BASE COURSE CU.M.	RCCP 60MM L.M.	RCCP 90MM L.M.	RCCP SUBTOTAL	RIPRAP CU.M.	TOTAL COST	COST PER KM
DAO-ES-TADAYAN, BE											
QUANTITY	2.70	2.70	2,160	28,788	1,251	78	0		160		
EQUIPMENT BASED COST		20,865	61,254	376,200	206,234	31,470		31,470	59,388	755,411	279,782
LABOR BASED COST		22,478	45,954	354,956	155,235	31,470		31,470	57,180	667,273	247,138
% DIFFERENCE		-7%	33%	6%	33%	0%		0%	4%	13%	
BAMBAN-BOLINTIN, ZA											
QUANTITY	5.00	5.00	4,235	42,242	2,475	36	0		27		
EQUIPMENT BASED COST		37,485	117,662	583,500	313,699	17,112		17,112	7,229	1,076,687	215,337
LABOR BASED COST		39,375	150,126	551,843	294,129	17,112	0	17,112	6,491	1,059,076	211,815
% DIFFERENCE		-5%	-22%	6%	7%	0%		0%	11%	2%	2%
CUANOS-PITOGO, CE											
QUANTITY	3.26	3.26	3,260	30,595	1,520	48	0		165		
EQUIPMENT BASED COST		24,870	90,847	422,790	206,374	28,324		28,324	39,817	813,022	249,393
LABOR BASED COST		22,005	92,163	305,954	206,323	28,324		28,324	40,950	695,739	213,417
% DIFFERENCE		13%	-1%	38%	0%	0%		0%	-3%	17%	
SAN VINCENTE-LEBAS, SC											
QUANTITY	2.66	2.66	7,494	14,475	998	60	0		272		
EQUIPMENT BASED COST		20,883	212,197	200,866	102,923	28,209		28,209	59,224	624,302	234,700
LABOR BASED COST		22,707	225,006	176,992	99,595	28,209		28,209	59,224	611,733	229,975
% DIFFERENCE		-8%	-6%	13%	3%	0%		0%	0%	2%	
BURBULI-PACALA, OM											
QUANTITY	2.53	2.53	1,904	16,672	1,252	0	84		92		
EQUIPMENT BASED COST		20,828	56,528	233,520	166,029		70,350	70,350	25,231	572,486	226,369
LABOR BASED COST		26,166	55,638	201,843	153,883	0	70,350	70,350	25,142	533,022	210,764
% DIFFERENCE		-20%	2%	16%	8%		0%	0%	0%	7%	
BANGBANG-ARCANGHEL, AK											
QUANTITY	2.89	2.57	1,460	15,898	1,431	120	0		40		
EQUIPMENT BASED COST		20,785	41,078	224,040	159,432	68,646		68,646	7,486	521,469	180,439
LABOR BASED COST		17,061	28,343	174,886	154,550	68,646		68,646	7,488	450,974	156,046
% DIFFERENCE		22%	45%	28%	3%	0%		0%	0%	16%	
UNIDOS-TAGAROC, AK											
QUANTITY	1.64	1.64	1,844	12,253	812	36	7		17		
EQUIPMENT BASED COST		12,471	56,408	174,720	82,139	6,652	22,577	29,229	7,925	362,892	221,276
LABOR BASED COST		12,815	45,595	152,784	93,296			29,229	7,925	341,644	208,320
% DIFFERENCE		-3%	24%	14%	-12%			0%	0%	6%	
BULOL-DETAL FITAK, SC											
QUANTITY	2.64	2.64	5,293	34,837	1,307	105	16		170		
EQUIPMENT BASED COST		20,884	148,266	485,425	157,940	49,366	11,158	60,524	49,589	922,628	349,480
LABOR BASED COST		22,536	149,075	452,233	155,921	49,366	11,158	60,524	50,936	891,225	337,585
% DIFFERENCE		-7%	-1%	7%	1%	0%	0%	0%	-3%	4%	
VENUS-BUENA VISTA, ZDN											
QUANTITY	7.45	7.45	13,043	27,752	3,688	196	36		193		
EQUIPMENT BASED COST		54,145	361,786	383,640	473,884	116,865	32,625	149,490	43,750	1,466,695	196,872
LABOR BASED COST		58,669	337,974	441,434	418,531	116,865	32,625	149,490	43,750	1,449,848	194,610
% DIFFERENCE		-8%	7%	-13%	13%	0%	0%	0%	0%	1%	
TOTAL											
QUANTITY	30.77	30	40,693	223,512	14,734	679	143	0	1,137		
EQUIPMENT BASED COST		233,216	1,146,026	3,084,701	1,868,654	346,644	136,710	483,354	299,641	7,115,592	231,258
LABOR BASED COST		243,812	1,129,894	2,812,925	1,731,463	339,992	114,133	483,354	299,086	6,700,534	217,769
% DIFFERENCE		-4%	1%	10%	8%			0%	0%	6%	

* BASED ON DPWH APPROVED EQUIPMENT RENTAL RATES

Table II-1 summarizes the data in Tables II-2 and II-3 for ease of comparison. (There are a few anomalies on individual items in the detailed tables that could not be resolved in the time available, but they would not significantly affect the overall conclusions that can be derived from the two tables.) The overriding conclusion that can be drawn from Table II-1 is that, for Upland Access type roads, the costs of construction by labor-based methods is competitive with, and probably somewhat cheaper than equipment-based construction. Based on the available evidence - see Section C below - the present UA productivity standards could be readily reduced by 25 percent and still leave room for productivity incentives. If this were done, the total costs of labor-based construction in both estimates would be decreased by 15 percent (labor is about 58 percent of the total), and labor-based construction would clearly be the most economical method of construction for these roads.

Given the un- and underemployment in the rural areas of the Philippines, the fact that labor-based construction is cost competitive should provide a strong bias towards labor-based construction for these types of roads. (See Section B below for a discussion of the employment effects of the two construction methods.)

Other conclusions that can be drawn from Table II-1 are:

- Clearing and grubbing is essentially equal in cost under the two construction methods.

- Excavation and embankment is cheaper with equipment in the PRIP comparison and equal in the constructed cost comparison. It is not clear why this should be so, since equipment-based excavation and waste is more expensive, and compaction costs should be equal.

- Excavation and waste is cheaper by labor-based methods. This confirms the conclusion in the 1983 ILO report.

- The costs of the aggregate base course are inconclusive. The base-cost comparison shows equipment to be cheaper, but the reverse is true in the constructed-cost comparison. The latter may be a more accurate measure, since the cost of this element is strongly influenced by material costs and haul distances, and the constructed-equipment costs use the actual amount for each road, while the PRIP-based costs are averages, with the actuals unknown.

- The placing of culverts (RCCP) is essentially a labor-based work element, even in equipment-based construction, so the costs should be equal under either method.

- In the PRIP comparison, labor-based riprap is significantly cheaper, but is not clear why this should be so. The constructed cost comparison may be a better measure of relative costs of riprap, because the only advantage of labor-based construction is the ability to recover materials on the site.

Table II-1

Summary of Cost Comparisons: Labor-Based vs Equipment-Based Construction (PESOS)

ELEMENT	PRIP COST COMPARISON	CONSTRUCTED COST COMPARISON
Clearing & Grubbing		
Equipment-Based Cost	234,215	233,216
Labor-Based Cost	243,812	243,812
% Difference	- 4%	- 4%
Excavation/Embankment		
Equipment-Based Cost	961,169	1,146,026
Labor-Based Cost	1,192,034	1,129,894
% Difference	- 19%	1%
Excavation/Waste		
Equipment-Based Cost	3,372,796	3,084,701
Labor-Based Cost	2,812,925	2,812,925
% Difference	20%	10%
Aggregate Base Course		
Equipment-Based Cost	1,349,746	1,868,654
Labor-Based Cost	1,732,144	1,731,463
% Difference	- 22%	8%
RCCP		
Equipment-Based Cost	494,632	483,354
Labor-Based Cost	483,354	483,354
% Difference	2%	0%
RIPRAP		
Equipment-Based Cost	445,683	299,641
Labor-Based Cost	299,086	299,086
% Difference	49%	-0%
TOTAL		
Equipment-Based Cost	6,865,054	7,115,592
Labor-Based Cost	6,700,534	6,700,534
% of Difference	2%	6%

2. Economic Costs

The NEDA approved shadow price factor for foreign exchange is 1.2. For unskilled labor it is 0.8. These factors have been used to derive the economic costs of equipment vs labor-based construction from the constructed cost estimates in Table II-3. For equipment-based construction 80 percent of total costs are for equipment and POL, and labor is 6.5 percent. For labor-based construction the percentage are 17 percent and 58 percent respectively.

Applying the shadow prices to these percentages produces the economic costs shown in Table II-4.

Table II-4

Economic vs Financial Costs - Costs Per Km.
(Pesos)

Type of Cost	Financial	Economic	Difference
Equipment-Based	231,258	265,253	+14.7%
Labor-Based	217,769	199,733	- 8.3%
Difference (eq. vs labor)	+6%	+ 33%	

Thus, in economic terms, equipment-based road construction costs one third more than labor-based. The Government's current emphasis on labor-based methods is clearly justified in economic terms.

B. EMPLOYMENT GENERATION

Based on standards of productivity, the nine approved Upland Access roads will generate a total of 124,706 person days of employment, excluding supervision*. The comparable total for equipment-based construction of these roads would be 14,431 days . Using labor-based construction for these roads is generating over eight times as much work as equipment-based construction would create. And, under the Project this employment is going to the residents of the upland barangays which will be served by the roads. This was an important objective of the project, and an instance where it has been notably successful.

Overall the nine roads will produce an average of 4,053 person days of employment per kilometer, compared to 485 days per km for equipment-based construction. The ranges of person days per kilometer for individual roads are 3,026 to 5,957, and 332 to 748 respectively.

*Actual person days will differ from the total, as a result of the higher productivity being achieved by the pakyaw groups. However, wages per day increase proportionally to this improvement, so that employment, in terms of the prevailing wage per day, will remain the same.

1. Productivity Standards

The productivity standards for the Upland Access Project are set forth in a manual titled, "Cost Standards, LB/ES Technology, Bayanihan Plan". The standards in this manual were taken from the standards set forth in the 1983 ILO study, Volume Two, Annex E - Productivity and Cost Guidelines. The standards are comprised of productivity rates for the units which comprise a work element (e.g., clearing). For example, the productivity standards for excavation and embankment with a haul distance of 11-25 meters using wheelbarrows, are:

Excavate	=	4 cu.m/m/day
Load	=	8 cu.m/m/day
Haul	=	10 cu.m/m/day
Spread	=	24 cu.m/m/day

Standards are used to develop subproject costs and pakyaw contracts and as the basis for reporting actual vs planned productivity. The reporting system calls for a weekly record to be kept for each pakyaw contract showing, by work element, programmed and actual time to complete the productivity standards, the number of laborers in the group and the handtools used.

2. Actual vs Programmed Productivity

There is a limited amount of data available on actual productivity, because only three roads are well along in construction, and the reporting data on one is not complete. The data that are available are shown in Table II-5. The average actual productivity for Benguet is based on seven separate road sections covering 1.1 kms and involving a total of 8,840 cubic meters of excavation. The average actual productivity for Zambales is based on 26 road sections covering 4.9 kms and involving a substantially greater quantity of excavation.

The table supports the consensus of UA technical staff that productivity, at least for excavation, is substantially exceeding the planned productivity rates. In these two provinces the actual excavation productivity is 41 percent and 69 percent greater than planned. This is not unreasonable. The pakyaw groups appear to be working well cooperatively, and their contracts provide strong incentives. Greater productivity means more pay per day, and also positions the group to be eligible sooner for another pakyaw contract.

These may not be enough data to provide a basis for a decision now, but the Project will need to review its planned productivity rates to determine whether or not they can be increased and still provide incentives.

Table II-5

Planned vs Actual Productivity

Province & Work Element	Average Planned Productivity	Actual Productivity	% Difference
Benguet			
Clearing (Med. bush)	100 sq m/m day	94	-6%
Grubbing	80 sq m/m day	95	+19%
Excavation/waste*	3 cu. m/m day	4.28	+43%
Slotting	3 cu. m/m day	4.22	+41%
Zambales			
Clearing (light bush)	200 sq m/m day	221	+10%
Grubbing	80 sq m/m day	121	+51%
Excavation/waste*	3 cu. m/m day	5.08	+69%

*Productivity for excavation and waste is a simplification of the planned productivities for varying haul distances, because actual haul distances are not known, and they are probably generally less than planned. This simplification may understate the difference between planned and actual productivity.

III. THE PROVINCIAL MAINTENANCE SYSTEM*

A. OVERALL SYSTEM RESPONSIBILITY

Up to 1967, the care and maintenance of all roads and highways in the Philippines was under the exclusive jurisdiction of the national department dealing with highways, now DPWH. The Decentralization Act of 1967 provided for creation of Provincial Engineering Offices (PEOs) and made the provinces responsible for all provincial roads. Thus, the institution of PEOs is relatively young. The PEOs are more or less independent and work directly under the Provincial Governors. However, the DPWH does provide loose technical supervision, because the national government is providing substantial budgetary support for maintenance of

*This Chapter draws heavily on R. P. Sikka's Concept Paper, Redesign of [the] USAID-Financed Upland Access Project.

the provincial roads. (DPWH Guidelines define technical supervision as "the supervision of the engineering aspects in the maintenance of local roads to ensure that pertinent standards, policies and procedures are adhered to. . .")

As part of decentralization, one would presume that PEOs were required to look after barangay roads as sort of feeder connections to the provincial roads. But for a combination of reasons, e.g., weak capability of the rather young PEOs, undue political interference in day to day work of the PEOs, and the general fragile financial base of the Provincial Governments, barangay roads came entirely to be neglected. As a consequence, the National Government stepped in during the mid-70's to launch major programs of barangay road improvement, and DPWH also assumed responsibility for maintenance of barangay roads. Because of the substantial budget being expended on rural road development, there was a clamour on the part of LGUs to get back control of barangay roads. The maintenance responsibility for these roads was transferred to DLG and PEOs for a brief period, from 1982 to 1985. But obviously the system did not work well, since DPWH regained responsibility for barangay roads in 1986.

There are some 28,000 kms of Provincial Roads in the Philippines, or an average of about 4000 kms per province. Most of them are gravelled, but there are also earthen unsurfaced sections. Provincial Governments are expected to spend on improvement of provincial roads from their own revenues. The Provinces derive their highway revenues from local taxes such as real property tax, or estate, inheritance, gift, and agricultural produce taxes. But their principal mainstay is the share of national tax revenues due to them by law (e.g. 20 percent refund on all BIR collections within the province) or a percentage of specific tax allotment under P.D. 436 on gasoline and other petroleum products. These two sources represent about 60 percent of a typical provincial budget. But by common admission they are receiving only 40-50 percent of the revenues due to them. The result is that spending on provincial road improvement suffers and the provinces look forward to special programs for rehabilitation or reconstruction of the sections in bad condition, which are many. USAID programs such as RRP have been a boon to them in the past.

B. THE PROVINCIAL ENGINEERING OFFICES

1. Organization and Staffing

The basic organizational structure of the PEOs is based on a model organization developed under the AID-assisted Provincial Development Assistance Program. The model structure consisted of a Provincial Engineer, an Assistant Provincial Engineer for Construction and Maintenance and one for Planning and Administration; and six divisions:

Construction
Maintenance
Equipment Pool
Quality Control
Administration
Planning and Programming

Although the PEOs are based on this model, the 1984 TAMS report on Infrastructure Investment and Maintenance found that the organizational form of the provincial engineering offices varies quite widely. Some are divided at the level of assistant provincial engineer into two major branches, one for support services and one for engineering (equipment maintenance can be found in either of these two branches). Each branch may have three divisions. Other offices simply separate the administrative function from engineering functions and have five divisions for the latter. Yet others have five or six divisions that are co-equal in the organizational line-up, though the maintenance section is typically much larger. In some cases, the construction function is combined with planning and design, with primarily a professional staff, indicating reliance upon contracts. More typically, however, construction is a separate division, with a staff of foremen and workers, indicating considerable use of force-account construction.

Staffing varies widely as a function of provincial size and resource availability, and probably for other reasons. For example, the PEO in Benguet has a total staff of 75, with 9 professional engineers; Zambales has a total staff of 269, with 23 professional engineers; Cebu has a total staff of 364, with 25 professional engineers; and Cotabato reportedly has a total staff of over 500.

2. Capabilities of the PEOs

There is a limit to what can be said about the capabilities of the PEOs at this point. Differences among them and among the provinces make comparisons difficult. The TAMS report states that, regarding the resources of provincial engineers to discharge their functions, only one of the six provincial engineers visited by the team specifically stated that he was short of personnel. No direct comparison between staff and length of road to be maintained can be made, because there are varying practices on the use of permanent staff, contract staff and casual hires (at both the professional and worker level), there are the different approaches to road construction and, finally, the provincial engineering offices have other responsibilities besides roads. Looking solely at road maintenance crews and comparing man-days of labor needed for a model nationwide maintenance program vs what provinces believed they could provide from their budgets, the consultant retained by MLG under the IBRD-supported Rural Roads Improvement Project found a shortfall of about 23%. In several of the provinces covered by subsequent maintenance feasibility studies, the same consultant found specific shortages of maintenance workers but also found that professional staff, aside from training and experience, were adequate.

The evidence of capability that is most relevant to any redirection of the Upland Access Project is the performance to date on the Project itself, since any redirection at this stage is unlikely to involve new provinces. Judged by this standard, they have proven their capability. The seven active provinces have been able to select and design upland access roads and they are well on the way to constructing them. They have done so despite the fact that the

Project is an extra burden outside their regular responsibilities, and the fact that labor-based technology is new to most of them. It seems reasonable to conclude that provinces currently in the program would be capable of applying labor-based technology to the rehabilitation and maintenance of provincial roads, which are within their responsibility and which are in poor condition generally.

C. MAINTENANCE OF PROVINCIAL ROADS

1. The System

Provincial roads receive ₱7,372.50 per km by way of national aid for maintenance. They are required to put up counterpart funds to the extent of 50 percent of this amount, i.e., ₱3,686.25 per km. Thus technically ₱11,058.75 is supposed to be spent per kilometer for maintenance. Release of national aid is through the DPWH Regional Offices based on programs prepared by PEOs. As noted, DPWH exercises general technical supervision or maintenance.

There have been attempts in recent years to systematize maintenance operations on the provincial roads. A "Maintenance Management Manual" for PEOs was developed in 1982 under the IBRD-assisted Rural Roads Improvement Programme (RRIP). Initially introduced in six RRIP provinces, the system has since been endorsed for adoption to all other provinces. It seeks to streamline maintenance through optimum use of equipment, based on a work activity schedule for routine and periodic maintenance. For each section, labor, material and equipment requirements are supposed to be carefully worked out, so that efficient use is made of all the maintenance resources available to the PEOs.

The field maintenance system consists of work groups (known as "camineros" or "construction helpers") at the rate of usually one person for 3 to 5 kms. These are led by sub-foremen (known as "capatas") and foremen. The work gangs are supported by equipment from the Equipment Pool. A study in 1983 for the IBRD-assisted Rural Road Development Programme II showed that roughly 30-35% of provincial Road maintenance budget goes for salary and wages of their field personnel, another 40-45% for maintenance and operation expenses of the equipment, and barely 25% or so on capital expenditure such as purchase of materials.

2. Maintenance Deficiencies

Generally the level of maintenance in most provinces is rather poor and one can find provincial roads in varying stages of disrepair. There are a number of basic reasons for this state of affairs. First, the 50 percent matching support for maintenance from the Provincial Governments is not always forthcoming. Second, the Provincial equipment is very old in most cases, and its upkeep suffers from lack of available spare parts. Some of this equipment came from U.S. excess property, and spare parts for it cannot be found easily. After 1983, because of foreign exchange shortages, procurement of parts for

even Japanese manufactured equipment has proven difficult. The result is that a good portion of provincial maintenance fleet is not in operating condition at any given point of time. Under the circumstances, an optimized system, which depends heavily on timely availability of equipment, can hardly be expected to function efficiently. And it has not.

Many local officials complain that the present funding criteria for maintenance are insufficient since they make no allowance for the inflation which has taken place over the last 2-3 years. People in DPWH disagree with this and say that it is more a case of efficient utilization of the total resources available for maintenance. Additional grants are not necessarily going to improve maintenance management of provincial roads. Provincial Engineers agree in informal discussions that their equipment as well as gang labor are very often diverted for other purposes at the command of the Governor or Mayors. It is common knowledge that Provincial equipment is being frequently utilized for new construction, sometimes even by contractors, and for emergency repairs. One can speculate that when Mayors borrow the equipment, they do not pay for POL and other expenses which are debited to maintenance budget as a matter of routine.

3. The Maintenance Status of Provincial Roads

The Provincial Engineers of four Upland Access provinces have submitted special inventories of their provincial road networks. These inventories classify the network by type of pavement and by condition. The condition classification was taken from the October 27, 1983 Memorandum from the Minister of Public Works and Highways, Subject: "Annual Assessment of the Maintenance of Local Roads." The classifications definitions for gravel roads are:

CONDITION	NATURE
VERY POOR	20% and over of defective surface area, either constructed or with pot holes widespread, longer and cavernous along a long deformed and deteriorated section with wearing course totally disappeared. Base failure evident and total reshaping and re-gravelling are necessary.
POOR	Greater than 10% but less than 20% of defective surface area, either rutted or with potholes deep and concentrated and wearing course partially displaced and/or disappeared.
FAIR	Greater than 5% but not more than 10% of defective surface, either rutted or with medium-sized potholes appearing at intermittent portions within the road section.
GOOD	Greater than 0% but not more than 5% of defective surface area, either rutted or

potholes small, shallow, few and far between. Surface corrugation slightly evident and wearing course intact.

VERY GOOD — No potholes and ruts. Wearing course intact. Smooth riding surface.

Although data are available for only four provinces, the four that have reported are leading candidates for participation in a provincial road rehabilitation effort, both in Sikka's Concept Paper and under provincial selection criteria developed by the UAU. The four provinces have a total road length of 2,279 kilometer, of which 2,149 km (94 percent) are gravel roads. The condition of these gravel roads, by province, are shown in Table III-1. The estimates of condition are desk estimates made by the Provincial Engineers, and are not based on actual surveys. The estimates are subjective, and there is probably some variance among the four in actual criteria, but the Provincial Engineers are generally knowledgeable about their road systems. The estimates should give a reasonably accurate indication of the potential need for road rehabilitation and maintenance in each province. (None of these gravel roads are considered to be in Very Good condition.)

Table III - 1

Condition of Gravel Provincial Roads

Provincial	KMS. OF GRAVEL ROAD, BY CONDITION				
	Good	Fair	Poor	Very Poor	Total
Zambales	26	54	51	2	142
Aklan	124	138	16	-	277
Zamboanga Del Norte	2	718	-	76	796
Cebu	-	-	269	666	935
Total	152	910	336	744	2,149
%	7%	42%	16%	35%	100%

In his Concept Paper, Sikka paints an even bleaker picture of the statistics on provincial roads. He state that:

Reliable data about the condition of Provincial Roads are not available. In discussions, Provincial Engineers were asked to categorise their system roughly into 3 categories: (a) good, needing only normal maintenance; (b) average, needing rehabilitation; and (c) bad, requiring substantial

reconstruction. Their answers, which could well be subjective, are summarized below:

	Good Condition	Average Condition	Bad Condition
Aklan	50%	25%	25%
Benguet	50%	25%	25%
Cebu	30%	20%	50%
Mindoro Oriental	20%	70%	10%
South Cotabato	50%	20%	30%
Zambales	25%	50%	25%
Zamboanga del Norte	25%	60%	15%

It is clear from Table III-1, and the Sikka data that provinces have enough deteriorated gravel roads to justify a trial of labor-based road rehabilitation and maintenance. What is not known is the proportion of these roads that serve upland areas or whether clusters for demonstration purposes are possible - except perhaps in Cebu.

IV. THE LENGTHMAN SYSTEM OF MAINTENANCE

A. THE SYSTEM

There is a limited amount of information on the lengthman system of road maintenance available in Manila, in part because the system is a relatively simple one.

The lengthman system is a labor-based system of road maintenance. Under it, contracts are given to individual workers to maintain a certain section of road for a fixed amount of money. The contract stipulates that payments can only be made if the section is in a good condition and it is clear that regular maintenance has been carried out. The fact that each worker's pay is tied to performance is the most critical element of the system. It is what distinguishes it from traditional force-account systems of maintenance, where workers are often assigned to specific road sections, but are salaried employees whose pay is based on time spent, not work accomplished. Frequent inspection tours, good supervision and a strict control of standards are, however, essential if this maintenance system is to be successful.

In Kenya, the lengthman system is being successfully employed for roads constructed by labor-based methods under the Rural Access Roads (RAR) Program. There, the workers are contracted immediately after the road, or a section of the road, has been completed. In general, the workers are persons who have been employed in construction of the road, and they must live in the immediate vicinity of the section of the road they are to maintain. As a result, no transport is required and they have a knowledge of road construction and of the standard to which the road has to be maintained. Since the workers are known to RAR supervisory staff, contracts can be offered to those workers who have shown both responsibility and diligence during the construction period. An additional and perhaps most important advantage is that it is known in the

surroundings which worker is responsible for the maintenance of a particular section of road. In this way, he is likely to come under social pressure if he fails to maintain his section.

The maintenance work is to be carried out as and when required. Major repairs, however, such as the replacement of broken culverts or the repair of washouts, are carried out by a special taskforce organized by the officer-in-charge or the RAR engineer. If such major repairs are necessary it is the duty of the maintenance worker to inform the local authorities, who in their turn are expected to inform the RAR maintenance staff. According to the requirements of his section, each maintenance worker is issued with a selection of the following tools and light equipment: hoe, shovel, culvert-cleaning shovel, bushknife, rake, grass-slasher, handrammer, file and wheelbarrow.

The length of each section of road allocated to one worker for maintenance varies according to the amount of work required to maintain it properly, but is based on the assumption that the contract for maintenance requires approximately 12 man-days of work per month. This enables the worker to spend the rest of his time on his own farm. The workers are paid a fixed monthly salary of 12 working days at the current rate for casual labor. If the road is in an unsatisfactory condition due to neglect by the worker, payment is withheld until the deficiencies are rectified.

Based on the amount of work required, the length of road assigned to a worker varies. In two programs in Africa the length per maintenance worker varies from .5 to 3 km, and the average lengths per worker are 1.6 and 1.7 kilometers. (However, these roads are narrower than provincial road standards in the Philippines, so a shorter length per man would probably be required here.)

In Kenya the inspection of the roads and supervision and payment of the workers is the responsibility of a maintenance inspector or officer-in-charge, who under normal circumstances should be able to supervise the maintenance of approximately 300 kilometers of road, depending on the average distance of his base camp from the roads. He is assisted by a clerk who handles the administrative work required (payrolls, etc.) and is provided with a landrover and driver.

The inspector drives the roads under his supervision and records the maintenance condition on a form which is the basis for worker payment. The Kenya forms are relatively simple. For each road section they classify the conditions as good, fair or bad for six maintenance functions - patching, reshaping, ditches and drains, culverts, bridges and drifts and grass cutting.

In Kenya, the system has proven to be capable of properly maintaining completed rural access roads which have relatively low traffic volumes. As traffic increases, the system can be adapted by reducing the length of road to be maintained by each worker. However, a point will eventually be reached where equipment assistance will be required - principally graders to eliminate the washboard effect created by higher traffic volumes, and to cope with the greater need for replacement of the aggregate base course.

B. TESTING THE SYSTEM IN THE PHILIPPINES

Developing a lengthman system of road maintenance for test in the Philippines should be a relatively straight forward proposition. It would involve the preparation of procedures for:

- Determining the quantity work to be done, by category for each section of road. (The categories of work would generally follow those contained in the Kenya supervisory report, cited above.);
- Setting standards of productivity;
- Determining hand-tool requirements and procuring and accounting for tools;
- Selecting workers;
- Supervising and paying the workers on the basis of performance;
- Providing materials, principally aggregate;
- Providing necessary equipment support.

If the system is to be tested in the Upland Access Project, either the current project or a redesigned one, the most difficult problem is likely to be supervision, and particularly transportation of supervisors. The present and planned Upland Access roads are relatively short (1.6 to 8 kms.) relatively remote, and few per province. If the project is redesigned to include the rehabilitation of existing provincial roads and then maintaining them with lengthman, these problems may be reduced, but it is not clear that they will be eliminated. Data are not available in Manila to determine whether clusters of rehabilitated roads can be created in selected provinces. But it is likely that they cannot, especially if the Project concentrates on rehabilitating the low volume and usually badly neglected roads at the tail end of the system, and especially those which serve as links to upland areas.

As a result, supervisory costs are likely to be relatively high during the test period, and transport will be a critical problem. The present project has continually been faced with shortages of transport. It will have to be provided somehow.

3. Costs

The Sikka report, the Redesign of USAID-Financed Upland Access Project, estimates labor-based maintenance costs of ₱17,000 km per year. This figures seems high, considering that the direct labor cost would be about ₱3,500 km per year at ₱35 per manday and 1.2 kms per lengthman. Our estimate for the cost of maintaining a kilometer of low volume gravel road per year are:

Direct labor	4,200
Handtools (3 yrs life)	1,250
Material (principally aggregate)	1,800
Supervision (Excluding transport)	500
TOTAL	7,757
SAY	8,000 per km.

V. EXISTING LABOR-BASED WORK IN THE PHILIPPINES

A. THE COMMUNITY EMPLOYMENT DEVELOPMENT PROGRAM (CEDP)

1. General

Philippines experience with labor-based road construction goes back to the mid 1970's, when it provided the model for the successful construction and maintenance program in Kenya. There have been a number of successful pilot projects since then, including the six construction projects in 1982-83 which were the basis for the ILO study which led to the Upland Access Project. However, CEDP is the major current initiative, which was launched in 1986 with the express objective of creating rural employment through labor-based construction. The program has considerable potential, but, due to various institutional constraints, it has many implementation problems. Its twin goals, in the sense of cost-effective projects and optimum employment corresponding to the scale of investment, will take time to realize.

For 1986, CEDP had a special outlay of ₱3.9 billion. In the current year, the program is on the order of ₱8.6 billion, all which is part of the regular budget. These are big amounts, but the government has made a firm commitment to increased use of labor-based methods for infrastructure projects over the next five years. The medium-term Philippine Development Plan for 1987-92 lays clear stress on labor-intensive methods of construction to help obtain the overall goal of one million additional jobs every year. CEDP-type projects, whether they are categorized as such in subsequent budgets or not, will therefore be a regular feature.

2. Types of Projects

The CEDP covers a wide variety of projects in a number of Departments and line agencies. However, the major share (about 64 percent in 1986) is managed by the Department of Highways and Public Works (DPWH). Within this, roads are the dominant component. For 1987, more than ₱1.7 billion is earmarked for roads out of the programmed ₱3.7 billion DPWH share-of CEDP. In 1986 the share of roads was of the same order.

A World Bank Mission which reviewed the CEDP in early 1987 concentrated more on CEDP road projects, and to some extent irrigation projects, on the ground that projects relating to school buildings, ports, flood control, etc. are labor-based traditionally and their inclusion in CEDP package had not made any significant difference in

implementation procedures or changes in technology. Also, the National Irrigation Authority (NIA) has been implementing small irrigation works generally with the help of labor-based methods. This labor-based system is well entrenched in NIA. Therefore, NIA had to make little extra effort to carry out CEDP projects in the expected manner. This cannot, however, be said of DPWH road projects, since most of them are presently implemented by equipment.

3. The Implementation of 1986 Projects

The CEDP for 1986 was announced on short notice for implementation during the July-December period, and funds reached field offices mostly in October or even later. Caught with little time and very few trained staff, it is no surprise that programs of work for most projects were not well prepared with respect to the use of labor-based technology.

Up to 59 percent of the 1986 projects were entrusted to contractors, with the remainder administered using either the pakyaw system or direct labor. Since private contractors are used to working with equipment and have little know how about labor-based methods, the Mission believed that most contract projects had actually been carried out with equipment. In comparison, projects by administration were more successful in mobilizing labor for construction, but not everywhere. Pakyaw contracts in at least some regions were cornered by local influential persons who either took recourse to equipment or used minimal labor. Many projects assigned to government units also suffered the same defects. (This conclusion corresponds with the consensus of persons knowledgeable about CEDP, that in 1986 the majority of the work was actually done with equipment.)

4. Institutional Development

The review Mission concluded that all of the problems identified in the 1986 implementation of the CEDP related to institutional capacity, and that they could be resolved over time. The major institutional constraints noted by the Mission were:

- A lack of trained personnel for programming and supervision in the DPWH field offices;

- Poor project selection, with too many very small projects (often less than half a km.);

- A lack of guidance for programming (i.e., planning) labor-based projects and integrating equipment support into them;

- No program for procuring hand tools;

- No program for orienting contractors to labor-based methods;

- No established systems for awarding pakyaw contracts;
- Inadequate provision for the site supervision which is critical to labor-based work; and
- Slow released of funds.

B. THE CENTRAL LABOR-BASED ADVISORY AND TRAINING TEAM (CLATT)

1. Organization

In support of the Government's policy of maximizing the use of labor-based methods of construction to promote employment, and in recognition of the kind of institutional constraints that have beset the CEDP, the Government created the CLATT in January 1987. The CLATT was established by a Memorandum of Agreement between the heads of the National Economic and Development Authority (NEDA), the NIA, the DPWH and the DLG. The functions and responsibilities of the CLATT are to:

- Assist the development and strengthening of permanent labor-based methods of construction/maintenance units in the DPWH, the NIA, the DLG, and the private sector;
- Coordinate the planning and programming, policy formulation, procedures, and development of training programs and materials in labor-based methods;
- Review and streamline existing rules and regulations affecting labor-based methods of construction/maintenance;
- Conduct training of labor-based trainors and project supervisors; and
- Undertake pilot labor-based construction and maintenance.

The CLATT is headed by a senior official of the DPWH, assisted by a Deputy Executive Director, also from the DPWH, who acts as the Chief Operations Officer. It is supervised by an Inter-Agency Steering Committee composed primarily of top echelon officials of the participating agencies, with the rank of at least Director.

Each of the parties to the Agreement has designated a permanent technical representative to the CLATT. These representatives are to be persons occupying high middle management positions. (The DLG has recently nominated a staff member of the Upland Access Unit to serve as its representative.)

The participating agencies are to contribute funds to cover operational expenses, and the DPWH provides secretariat and administrative services.

2. UNDP/ILO Support

In support of CLATT, the UNDP has approved a technical assistance project titled, Nation-wide Application of Labor-Based Methods (LEM) in Infrastructure Projects.

The UNDP Project is being implemented by the International Labor Organization (ILO). Its objectives are:

- To assist the Government in the nation-wide application of labor-based methods in infrastructure projects through the establishment of a permanent capacity within DPWH, DLG, NIA to plan and implement labor-based construction projects;

- To build capability within the private sector (contractors and consultants) to design, plan and implement labor-based projects efficiently;

- To prepare common training modules and manuals and to assist in carrying out suitable programs for the training of trainers; and

- To promote increased domestic capacity for the manufacture of appropriate hand tools and light equipment for use in labor-based projects.

The project will provide long and short term technical assistance. It includes two expatriate ILO advisors a chief of Technical Advisor and a labor-based Training Advisor. They will be assisted by two Associate Advisors being supplied by individual donors - a Handtool Advisor and an Irrigation Advisor. The project includes three local advisors - a Training Engineer, a Contractor-Engineer and a Tools and Equipment Specialist; and 11 pm of expatriate and local short-term technical assistance.

3. Relationship of CLATT to the Upland Access Project

The CLATT will have essentially a dual relationship with the Upland Access Project. Initially, the Project will be more of a contributor to, than a beneficiary of, CLATT activities. The procedures developed and being tested in the Project, and its experience to date, will serve as important inputs to CLATT as it seeks to develop comparable procedures for adoption by the other agencies. The recent appointment of a staff member of the UAU as the DLG representative to CLATT is explicit recognition of this fact.

However, over the last two years of the UA Project, it should receive significant support from CLATT. It will be able to draw on the technical expertise of the CLATT advisory group; improvements in procedures can be integrated into the Project, and CLATT training programs, such as the supervisory training program due to start in october, can be used to train provincial personnel. The CLATT will also provide a ready forum for the resolution of inter-agency issues, and to solve continuing problems, such as the problems of hand tool procurement and quality.

VI. POSSIBLE REDIRECTION

A. CHANGED CONDITIONS AND LESSONS LEARNED

1. Changed Conditions

The scope of work for this study identified three conditions that have changed significantly since UAC was designed. They are:

- First, as the "Upland Access" name suggests, poverty was concentrated in the uplands during the design of this activity. Now poverty has become endemic throughout the country, and AID has accordingly dropped its regional and poverty focus of the early 80's.

- Second, the Department of Public Works and Highways (DPWH) is now solely responsible for barangay road construction and maintenance, not the PEO and DLG as was the case during the UAC design.

- Third, the 20-year old Marcos Government has been replaced, resulting in a complete re-examination of GOP development policies, priorities and programs. One result of this re-examination has been shift in GOP infrastructure priorities from new construction to maintenance and rehabilitation. Instead of entering into new construction, the Aquino government wishes to stretch the life of the existing (already extensive) national road network.

These are two additional important changes which should be added to these three: They are:

- The apparent increasing difficulty in finding viable upland subprojects in the seven active provinces, and

- The possession of the Upland Access Project of a coherent system for the construction of local roads that is unique to the Philippines. The potential of this system as a model that can be adapted by other organizations is particularly important in view of the recent Government emphasis on the increased use of labor-based methods.

2. Lessons Learned

Similarly, the Scope of Work for the study states that it should presume that we have already learned six lessons about the project. These lessons, with some parenthetical comments about them, are as follows:

- Project resources are spread too thin in 9 provinces and need to be more concentrated to have a demonstrable effect. (There is a problem of demonstration effect, but it may be more a function of the geographic isolation and dispension of upland subproject, than the amount of resources per se. If the Project were carried forward to complete all projects, including those identified, but

not verified, then five provinces will have built 14 or more kilometers of upland access road with labor-based methods. These would have a demonstration effect if they were more accessible and more concentrated.)

- A refocus from upland new construction to provincial road rehabilitation and maintenance using labor-based methods would be within DLG's and the PEO's jurisdiction. The refocus would in fact include a mix of upland projects already in the pipeline along side new provincial projects. (This is correct, although the DPWH will retain technical supervision of the maintenance of provincial roads. Given Government policy and the inter-agency agreement on CLATT, the DPWH should support labor-based road maintenance, provided maintenance standards are not compromised.)

- Subproject selection criteria are too complex and need to be streamlined. (As noted earlier, this is not at all clear. the problem may lie more in how to criteria are applied and how closely and firmly the selection procedures are followed.)

- Since physical implementation has been slow in taking off, the UAU staff has done little analysis of the labor-based experiment, including the growing amount of subproject socioeconomic data collected so far. The time has come for such analysis to start.

- Implementation has been slow. The project needs to obligate and disburse funds. At the same time, it needs to achieve labor-based results that are visible, measurable and lasting. (Implementation was slow to start, but it is the conclusion of this study that the project will achieve its subgoals, purpose, and all of its outputs except the physical targets.)

- A redesigned project cannot depend on expensive levels of expat technical assistance. (There does not appear to be a need for substantial expat technical assistance. Competent local advisors are available, and the project can draw on the resources of CLATT.)

B. THE POTENTIAL FOR REDIRECTION

1. The Potential

The above sections, and the preceeding chapters of this report point to a potential redirection - or perhaps, more accurately an expansion - of the upland Access Component to include labor-based rehabilitation of provincial roads, especially the historically neglected roads at the tail end of the provincial systems. In summary such an expansion:

- would be in accord with national priorities and policies on employment generation.

- should strengthen the longer term institutional status of the Upland Access Unit, which is threatened by the Department of Local Government's loss of responsibility for barangay roads

- should be of interest to the provinces, because they have substantial inventories of gravel roads in poor or very poor condition, and they lack funds to rehabilitate then. Similarly, labor-based maintenance has the potential of overcoming the problems of deadline and diversion of equipment which are major causes of poor provincial road maintenance.

- would capitalize on the institutional capacity for labor-based work that has been built up in the UAU and the participating provinces.

- would help lay the ground work for a follow on AID project of labor-based road construction, rehabilitation and maintenance.

2. Some Caveats

However, three caveats are in order:

First, there is a technical issue as to whether the present project can be expanded within the umbrella of the overall Rainfed Resources Project. If the word upland was removed from the purpose and goal, it clearly could, but would this be in keeping with the overall project goal? One way to deal with this might be to limit rehabilitation to roads at the tail end of the provincial systems that provide access to upland areas. This would appear to be feasible, but data are not available to determine it with certainty.

Second, employment generation will be lower. Road rehabilitation does not play to the greatest strength of labor-based methods, which is excavation. As a result, the labor component will be less in rehabilitation projects. In a new road about 58 percent of the total cost (including equipment rental) is spent for labor. In a rehabilitation project the labor share will be about 33 percent of the total costs. In the current subprojects, a kilometer of road construction generates an average of 4,053 person days of employment. A kilometer of rehabilitation will generate about 2,400 person days.

Third, an expansion would require an extension of the Project. The remaining two years are not enough to complete and implement a redesign to include provincial road rehabilitation and maintenance.

C. THE ALTERNATIVE

Given the current progress of the project, there is no justification for terminating it early. The only real alternative to redesign is to allow the present Project to run to completion. If this were done, at least $1,000,000 could be deobligated now, and probably more later. There are two major disadvantage to this alternative to redesign:

- It would leave little behind institutionally, since the DLG has lost the responsibility for barangay roads.

- More importantly, it would fail to capitalize on the work and progress to date. This would be particularly unfortunate in light of the present Government's strong emphasis on labor-based construction as a means of addressing unemployment.

D. NEXT STEPS

The actionable steps that must be taken to effect a redesign of the Project are presented in this section. The steps, sequentially are:

1. A decision in principle by USAID and the DLG to proceed with the redesign of the UAC. Implicit in such a decision are:

   - An initial determination by USAID that redesign can be accomplished within the structure of the Rainfed Resources Project; and

   - A willingness to extend the life of the redesigned project by two years - i.e., to a PACD of September or December 1991.

2. Initial selection of the provinces which would participate in the rehabilitation and maintenance component of a redesign project. For demonstration purposes, and for management purposes, including field supervision, the number of provinces participating in rehabilitation should be limited - probably to not more than four. Using a set of judgemental criteria Sikka nominated five candidate provinces. The UAU has developed a set of mathematical selection criteria. The resulting nominations are:

Province	Sikka	UAU
Zambales	x	x
Cebu	x	x
South Cotabato		x
Oriental Mindoro	x	
Aklan	x	x
Zamboanga Del Norte	x	x

   Aklan apparently does not have sufficient total road length requiring rehabilitation to justify its participation. If so, participation must come from the five remaining provinces listed above. However, it should be recognized that these five provinces will have the lion's share (about 85 percent) of the upland access road construction if the present Project proceeds as scheduled.

3. A determination of the interest of the selected provinces in a trial of labor-based rehabilitation and maintenance.

4. An assessment of the interested provinces' capability to continue their upland access construction and implement a labor-based rehabilitation and maintenance effort.

5. The conduct of reconnaissance surveys on a sample basis in the interested provinces.

   These surveys are needed to determine whether the provinces have enough roads requiring rehabilitation which can meet the test of

providing access to upland areas, and also provide the geographic concentration desired for demonstration purposes.

6. The refinement of labor-based rehabilitation and maintenance costs.

   Ideally they should be based on sample actual cost estimates for two or three roads in each participating province.

7. The preparation of selection criteria for road rehabilitation and maintenance.

8. Update the list of potential upland subprojects.

9. Determine the mix of upland subprojects and rehabilitation and maintenance.

10. The preparation of a Project Paper Amendment reflecting the decisions reached.

11. The preparation of a revised implementation plan for the Project.

D. ISSUES TO BE RESOLVED

There are some obvious issues that will need to be resolved in the process of Project redesign. They are identified and discussed briefly below.

1. Barangay Contribution

The barangay contribution of five percent of construction costs in the form of free labor does not appear to be as applicable to provincial road reconstruction as it is to upland roads. The barangays along a provincial road are only part of the beneficiaries, since the road serves through traffic. In the redesign, consideration should be given to dropping this contribution.

2. Equipment Procurement

The equipment spreads budgeted in the original Project design have not been procured and probably should not be. The possible exception is some transportation (locally made vehicles or motorcycles) for supervision of the rehabilitation program, and perhaps the remaining upland access projects.

3. Cost Sharing

If the barangay contribution is eliminated, then cost sharing will have to be realigned. In addition, reprogramming of equipment funds to rehabilitation and maintenance will require either a revision in cost sharing or an increase in the GOP contribution. The question of the provincial contribution, if any, to maintenance and rehabilitation will also have to be decided.

4. Site Supervision Incentives

Consideration should be given in redesign to the provision of site supervisor incentives similar to those for now provided for facilitators, from the GOP counterpart contribution.

5. Handtool Procurement

The problem of handtool procurement should be resolved in Project redesign. There is a concensus among present and past ILO advisors, and project staff that there is presently only one source for handtools that meet quality specifications but, the DLG is presently not able to enter into sole source procurement. (The DPWH regulations do permit sole source procurement.)

VII. CURRENT BUDGET AND FINANCIAL PLAN

A. THE CURRENT BUDGET

1. Background

Table VII-1 shows the costs of approved and pending Upland Access subprojects, by cost category and source of funds. In the table, Direct Construction Costs equate to the Construction Cost line item in the Project Paper Supplement. The provincial and GOP indirect costs were not reflected in the supplement totals, which included only the provincial maintenance contribution, in addition to direct construction costs. The indirect GOP costs are for facilitator incentives and transport and per diems for selected provincial staff. These costs present a minor problem. They are being charged to the GOP counterpart total, and, in theory, the GOP counterpart will be used up with $98,000 remaining in the AID allocation for construction. This should be corrected if the project is amended, and the amendment should consider an incentive allowance for site supervisors who are left out at present.

Table VII-2 is derived from table VII-1, and shows the unit costs for the approved and pending subprojects, by type of project. The average cost per kilometer for the nine approved roads and the two that are under review in AID is ₱225,000 per kilometer. This average was used for three of the road projects for which plans are being prepared. The cost estimate for the fourth was provided by the province.

2. Current Financial Status

The current financial status of the overall project is presented in Table VII-3. The table includes only USAID and GOP costs, and this is $500,000 less than the approved project total cost. This amount is comprised of the Barangay contribution in kind of five percent of direct construction costs and the provincial maintenance contribution. If all subprojects approved, under review and being

TABLE VII-1
COSTS OF APPROVED AND PENDING PROJECTS - UPLAND ACCESS
000

PROJECT ROADS	LENGTH	TOTAL COST	DIRECT CONSTRUCTION COST	USAID	GOP COUNTERPART DIRECT	INDIRECT	TOTAL	PROVINCE INDIRECT	MAINT.	BARANGAY
APPROVED										
DAO-ESTADAYAN, BE	2.700	854	762	571	152	11	163	45	36	39
BAMBAN-BOLINTIN, ZA	5.000	1,022	888	666	178	13	191	54	68	44
CUANOS-PITOGO, CE	3.260	803	707	530	141	11	152	41	44	36
SAN VINCENTE-LEBAS, SC	2.660	600	525	394	105	8	113	31	36	26
BURBULI-PACALA, OM	2.529	554	484	363	97	7	104	29	34	24
BANGBANG-ARCANGHEL, AK	2.890	520	447	335	89	7	96	27	39	23
UNIDOS-TAGAROROC, AK	1.640	385	338	253	68	5	73	20	22	17
BULOL-DETAL FITAK, SC	2.640	899	805	604	161	12	173	46	36	40
VENUS-BUENA-VISTA, ZDN	7.450	1,495	1,292	969	258	19	277	83	101	65
SUBTOTAL - APPROVED	30.769	7,132	6,248	4,685	1,249	93	1,342	376	415	314
UNDER REVIEW - AID										
SAN JOSE-TELAFAS, SC	6.540	2,679	2,415	1,811	483	35	518	141	88	121
PINAMAR-MURAPAY, ZDN	7.280	1,633	1,456	1,092	291	22	313	57	98	73
SUBTOTAL - PENDING	13.820	4,312	3,871	2,903	774	57	831	197	187	194
BEING PREPARED										
NAUGSOL-TIBAG, ZA	8.000	2,034	1,800	1,350	360	25	385	101	108	90
CONRAZON-BURIAO, OM	8.000	2,034	1,800	1,350	360	25	385	101	108	90
LANGKAS-NALHUB, CE	7.000	1,780	1,575	1,181	315	22	337	89	95	79
SIBALIW ACCESS, AK	2.000	562	500	375	100	7	107	28	27	25
SUBTOTAL-PREP.	25.000	6,410	5,675	4,256	1,135	79	1,214	319	338	284
TOTAL ROADS	69.589	17,854	15,794	11,844	3,158	229	3,387	892	939	792
TRAILS - UNDER REVIEW										
DUMALIG-SITIO ILNAP, SC	3.000	430	402	302	80	6	86	22		20
FOOTBRIDGES -UNDER PREP										
BANAO FOOTBRIDGE, BE	160	528	480	360	96	7	103	41		24
CAYOCO FOOTBRIDGE, BE	90	289	270	203	54	4	58	15		13
GAMBANG-MALAGYO FB, BE	140	449	420	315	84	6	90	23		21
SUBTOTAL FOOTBRIDGES	390	1,266	1,170	878	234	17	251	79		58
TOTAL APPROVED AND UNDER REVIEW - PESOS		11,444	10,119	7,588	2,023	150	2,173	573	602	508
- DOLLARS		572	506	379	101	8	109	29	30	25
TOTAL BEING PREPARED - PESOS		7,676	6,845	5,134	1,369	96	1,465	398	338	342
DOLLARS		384	342	257	68	5	73	20	17	17
GRAND TOTAL - PESOS		19,120	16,964	12,722	3,392	246	3,638	971	939	850
GRAND TOTAL - DOLLARS		956	848	636	170	12	182	49	47	43

TABLE VII-2
UNIT COSTS OF APPROVED AND PENDING PROJECTS - UPLAND ACCESS
000

PROJECT ROADS	LENGTH	TOTAL COST	CONSTRUCTION COST	COST PER KILOMETER* OR METER TOTAL	CONSTRUCTION
APPROVED					
DAO-ESTADAYAN, BE	2.700	818	762	303	282
BAMBAN-BOLINTIN, ZA	5.000	955	880	191	178
CUANOS-PITOGO, CE	3.260	759	707	233	217
SAN VINCENTE-LEBAS, SC	2.660	564	525	212	197
BURBULI-PACALA, OM	2.529	520	484	206	191
BANGBANG-ARCANGHEL, AK	2.890	481	447	166	155
UNIDOS-TAGAROROC, AK	1.640	363	338	221	206
BULOL-DETAL FITAK, SC	2.640	863	805	327	305
VENUS-BUENA-VISTA, ZDN	7.450	1,394	1,292	187	173
SUBTOTAL - APPROVED	30.769	6,717	6,248	227	212
UNDER REVIEW - AID					
SAN JOSE-TELAFAS, SC	6.540	2,591	2,415	396	369
PINAMAR-MURAPAY, ZDN	7.280	1,535	1,456	211	200
SUBTOTAL - PENDING	13.820	4,125	3,871	303	285
BEING PREPARED					
NAUGSOL-TIBAG, ZA	8.000	1,926	1,800	241	225
CONRAZON-BURIAO, OM	8.000	1,926	1,800	241	225
LANGKAS-NALHUB, CE	7.000	1,686	1,575	241	225
SIBALIW ACCESS, AK	2.000	535	500	268	250
SUBTOTAL-PREP.	25.000	6,073	5,675	247	[illegible]
TOTAL ROADS	69.589	16,915	15,794	243	[illegible]
TRAILS - UNDER REVIEW					
DUMALIG-SITIO ILNAP, SC	3.000	430	402	143	134
FOOTBRIDGES -UNDER PREP					
BANAO FOOTBRIDGE, BE	160	528	480	3	3
CAYOCO FOOTBRIDGE, BE	90	289	270	3	3
GAMBANG-MALAGYO FB, BE	140	449	420	3	3
SUBTOTAL FOOTBRIDGES	390	1,266	1,170	3	3

*EXCLUDES MAINTENANCE COSTS

planned are carried forward, the status of these line items would be as follows:

$000

	Budget	Committed	Balance
Barangay Contribution	130	43	87
Maintenance Fund	370	47	323

The USAID and Central GOP funds shown as committed in the first section of Table VII-3 (Subtotal - A) are actual commitments, except for Construction of Handtools. The amounts in these two categories is based on subproject status, regardless whether a formal fund commitment has been made. Subtotal-A includes these costs for the 9 roads and one trail that have been approved, or are under review in AID and have already received technical approval. These are commitments in all but the technical accounting sense of the word.

Subtotal-B includes the estimated costs of the four roads and three footbridges for which plans are now being prepared. This appears to be the minimum that would be expended even if a complete re-direction of the Project was ordered now. There is no reason why these projects, which are so far along in development should not be approved and funded.

The final Total includes funding for seven road projects that have been identified by the actively participating provinces, but have not been tested for feasibility. It is this Total that is used below in the projected budget for a re-directed project, on the grounds that it is a reasonable estimate of additional upland projects that might be funded, even if provincial road rehabilitation and maintenance is added. Completion of these subprojects would leave on estimated $1,276,000 in AID and GOP construction funds available for reprogramming.

The other major item in the Total fund availability is the $500,000 for construction equipment which has not been committed. These funds are also available for reprogramming.

B. REVISED FINANCIAL PLAN

A revised financial plan for the Project is presented in Table VII-4. It is based on the following assumptions, which are discussed further in Chapter VI. (All peso costs have been converted to dollars at 20.:1).

- That upland projects will be continued, and that the equivalent of seven road projects will be accomplished in addition to the projects currently approved, under review, or being actively planned.

TABLE VII-3

STATUS OF FUNDS - UPLAND ACCESS COMPONENT - $000
BUDGET VS COMMITTMENTS - AUGUST 31, 1987

COMPONENT	USAID REV. BUDGET	USAID COMMIT/ PLANNED	USAID AVAIL.	GOP REV. BUDGET	GOP COMMIT/ PLANNED	GOP AVAIL.	TOTAL REV. BUDGET	TOTAL COMMIT/ PLANNED	TOTAL AVAIL.
CONSTRUCTION APPROVED & UNDER REVIEW	1,870	379	1,491	500	109	391	2,370	488	1,882
EQUIPMENT	500	0	500	0	0	0	500	0	500
HANDTOOLS	30	19	11	30	17	13	60	36	24
TRAINING	50	39	11	45	17	28	95	56	39
TECHNICAL ASSISTANCE	500	363	137	0	0	0	500	363	137
EVALUATION	50	0	50	25	0	25	75	0	75
SUBTOTAL - A	3,000	800	2,200	600	143	457	3,600	943	2,657
PLANNED									
CONSTRUCTION		211	1,280		60	331		271	1,611
HANDTOOLS		8	3		8	5		16	8
SUBTOTAL - B	3,000	1,019	1,981	600	211	389	3,600	1,230	2,370
CONSTRUCTION POTENTIAL ADDITIONAL		280	1,000		55	276		335	1,276
TOTAL	3,000	1,299	1,701	600	266	334	3,600	1,565	2,035

- That equipment will not be procured, except for a limited number of locally made vehicles and motorcycles for supervision.

- That labor-based provincial road maintenance will cost ₱8000 per kilometer, and that the Project will finance maintenance for two years, with the provinces setting aside maintenance funds for the succeeding two years.

- That rehabilitation of 150 kilometers of provincial roads will cost an average of ₱225,000 per km. This estimate includes equipment rental costs. (Sikka estimated these costs at ₱200,000. The 225,000 estimate is derived from the cost calculation for an actual 8 km rehabilitation project in Benguet, and an analysis of four existing DPWH barangay road rehabilitation projects and three existing Rural Roads Program rehabilitation projects.) No provincial contribution to these costs is assumed.

- Handtools costs per kilometer for rehabilitation are assumed to be $500 per km., per for Sikka's calculation. Handtools for maintenance are included in the $400 per km. annual maintenance cost.

- That six additional person years of local technical assistance will be required.

Table VII-4

Revised Financial Plan - Upland Access Project - $000

Component	USAID	GOP*	TOTAL
Upland Construction	875	224	1,094
Rehabilitation	1,350	338	1,687
Provincial Road Maintenance	80	20	100
Equipment	50	-	50
Handtools	65	65	130
Training	50	25	75
Technical Assistance	480	-	480
Evaluation	50	25	75
TOTAL	3,000	697	3,697

*Excludes barangay construction contribution and financial contribution for maintenance and indirect costs.

ANNEX A

ARTICLE III - STATEMENT OF WORK

The Contractor will be responsible in completing the following tasks:

A. Evaluate the existing UAC framework

Drawing from the summary of the six reports shown above, this evaluation will provide input to conceptualizing a new LB framework more responsive to the needs of DLG and the PEO. the consultant should assess the UAU set up, including staff responsibilities and how they have been carried out. what is the status of projects? How effective has implementation been in achieving UAC objectives. What LB capacity has been created at DLG and the PEO? What have we learned about community participation, including the role of the facilitator and the pakyaw system? This preliminary analysis will be a desk review of existing data, in discussion with AID and DLG representatives. This analysis should document how, from the design of UAC to its implementation, the needs of DLG and PEO have changed. The consultant may direct the two host-country contractors (a sociologist and engineer) to assist in this analysis.

B. LB Productivity and output

In relation to (A) above, discuss quantifiable LB achievements.

Using available data, the consultant should compare the cost/km with labor in contrast to equipment. How much employment have projects so far generated? The consultant should discuss UAC productivity norms, the methodology and monitoring requirements involved. what productivity has been achieved? Using labor rather than equipment requires careful supervision. LB projects often fail more in supervision and management than in technical problems. In economic terms, quantify the benefits of the Lb methodology in relation to any supervision and management problems it represents. The consultant should work with the host-country engineer in this analysis.

C. DLG reorganization and UAU

Describe the new DLG reorganization and the projected role of UAU. Does this change the chances of a permanent UAU? Should the unit be free-standing or have a "home" under an existing program? In terms of redesign, should AID require strengthening UAU capabilities?

D. The provincial maintenance system

Describe the present provincial maintenance system. Discuss PEO resources, the staffing pattern and funds available for maintenance (in theory and in practice as there is a difference between the two in financial terms). How does the PEO relate to the regional office of DPWH for maintenance? since DPWH technically supervises central funds provided for provincial maintenance, how much flexibility exists to testing a LB maintenance system? This feasibility analysis would include documenting

current provincial maintenance standards. This documentation should include a provincial road inventory, both the classification and condition of roads. This analysis, including the inventory, will be based on existing data DLG will provide.

E. Lengthman system of maintenance

In consultation with local ILO advisors, execute a literature search on the lengthman system. Assemble, review and summarize information on how it works and how UAC would introduce, implement and test the lengthman system of maintenance. suggest preliminary guidelines and procedures for introducing it. what are the supervision and monitoring requirements? Contrast the implementation requirements of the lengthman system to the current UAC requirement for upland construction. If UAC tests the lengthman system, provincial maintenance projects would be implemented along side upland new construction. Does DLG and the PEO have the capacity ot manage tandem implementation responsibilities? Since this still represents an LB experiment, suggest what are the preliminary data requirements of this new maintenance system. The host-country engineer will assist you in this analysis.

F. Realign UAC budget

Document the current status of the budget, including GOP and AID funds. We have so far approved 9 upland projects. Approximately 10 more upland projects are in various states of the approval process. If these projects are technical viable, should we approve all 10? Can/should we consider additional upland projects? Does this leave sufficient funds to test LB provincial rehabilitation and maintenance? Suggest a revised financial plan which would include a mix of "upland" and "provincial" projects.

G. Existing LB work in the Philippines

This documentation will focus on the GOP Community Employment Development Program (CEDP) and the UNDP-funded and ILO-staff Central Labor-Based Advisory and Training Team (CLATT). Contrast the continuing and redesigned role of UAC to this existing LB work. for CEDP, refer to Raj Sikka's February '87 evaluation of this program. For CLATT, discuss with Mike Clapham, the ILO CLATT advisor.

H. Continuing analysis needs

As a result of performing the analysis (A-H), determine, what further feasibility work, if any, must still be carried out in order to implement a redesigned project.

ARTICLE IV - REPORTS

By week 3, the consultant should present an oral briefing (including a written executive summary) to AID management on his preliminary results and findings. this briefing will summarize conclusions of his analysis (A-H) as well as the summary of documents (1-6) and will identify options and next steps for

redesign. Based on agreements from this presentation, the consultant will prepare his final, detailed report to be submitted to USAID before the consultant departs from post. The report should detail actionable next steps tightly-focussed summary of those steps.

ANNEX B

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