

UNITED STATES GOVERNMENT

Memorandum

PD-AAF-887-01

TO : Mr. Thomas C. Niblock, Director

DATE: January 14, 1980

USAID/Indonesia

FROM : *Fred C. Shaver*
Fred C. Shaver, AAG/EA

SUBJECT: Memorandum Audit Report No. 2-497-80-4
Aceh Road Betterment Project (Loan 497-T-036)

1. INTRODUCTION, BACKGROUND AND SCOPE

AID's involvement in the Aceh Road Betterment program in Indonesia combined the financing of a discrete unit of infra-structure with a more broad based institution-building effort responsive to the Congressional Mandate of meeting Basic Human Needs (BHN) by emphasizing assistance to the rural poor.

Specifically this was to be accomplished by simultaneously strengthening the capabilities of the Government of Indonesia's (GOI's) Department of Highways (BINA MARGA) and that of the indigenous road construction industry.

When AID's Loan 497-T-036, for US\$10.3 million, was signed in May 1975, with a programmed GOI local currency contribution of the US\$ equivalent of 9.7 million, the tangible immediate benefit was to be the restoration to service of hitherto barely usable sections of road, totalling 321 km (about 200 miles), with a proportionate number of bridges fording this uniquely mountainous and inaccessible province in Northern Sumatra.

The concurrent intangible, but even more important developmental fallout was to open up the entire hinterland, as a first-step measure to link farmers and markets, by shortening travel time from a matter of days to a matter of hours.

In that process the growing skills of both the public and private sectors, with respect to road building ability, would become self-generative. So much for the concept.

It was an ambitious plan, whose bold and innovative approaches contained certain basic assumptions which subsequent events proved to be tied to less-than-valid original premises, such as the pre-existence of certain fundamental areas of

indigenous knowledge and expertise. This talent over-assessment led, among other factors, to an underestimate of costs, with additional funding requirements becoming the obligation of the GOI.

The net result has been serious project slippage and cost overruns, aggravated by inflationary trends. USAID/I's initial standard monitorship escalated steadily, and the Mission became increasingly involved in operational activities and problem solving efforts well beyond those originally contemplated, or provided in its regular staffing pattern.

This has had two further unplanned chain reactions:

1. Stretching Mission management resources beyond normal limits;
2. The need to intervene more frequently and more intensely with various organizational elements of the GOI, its consultants and contractors than one would, as a rule, expect, under the circumstances. Frequency and intensity of interventions had to be tempered in terms of productivity/counterproductivity trade-offs.

As a result of these various difficulties the completion of the project is likely to extend into the early 1980's, but at least it now stands a chance of being finished, a probability which was far less certain a year ago, when the Mission increased its involvement.

At the time the loan was signed, a December 31, 1979 Terminal Disbursement Date (TDD) was contemplated. 1982 carries a far greater degree of realism, assuming no further unexpected complications occur.

Our review, covering the period from March 1, 1976 to July 31, 1979, aimed at determining whether:

1. U.S. resources were being utilized in accordance with appropriate legislation and regulations.
2. U.S. resources were being used economically and efficiently.
3. Anticipated project results were being achieved.

Our findings were discussed with Mission officials, and their comments are included in the report, as appropriate.

II. AUDIT FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

The Aceh Road Betterment (ARB) project planned to combine the improvement of road links with the development of an Indonesian road construction capability. This involved the use of three inexperienced Indonesian contractors, at remote construction sites. Many significant logistics and communications problems surfaced, delaying the on - schedule attainment of original project goals, among them:

- Inadequate road survey and alignment design;
- Questionable economic feasibility of bridges relying heavily on the use of timber;
- Difficulties in training Indonesian construction and engineering contractors;
- Solution of equipment repair and maintenance problems.

The significance of the design deficiencies was only detected after construction contractors were mobilized and work began, and have remained a fundamental constraint to timely and efficient construction since.

Similarly, planning initially called for the use of timber in building bridges, with a subsequent determination that wooden bridges were of higher overall cost than those of concrete. This discovery necessitated the redesign of bridges.

Planners, while not unaware of the virtually total absence of a road building capability in Aceh Province, nevertheless anticipated that such a capability could be developed during the course of the project. For a variety of reasons the Indonesian road construction contractors have experienced considerable difficulties in achieving a reasonable level of performance until recently.

Availability of trained service personnel and adequately operable spare parts at all worksites was not effectively planned, resulting in frequent equipment breakdowns, thus limiting the slow pace of construction even further.

Correcting technical design deficiencies became a three-year task, partially because of the difficulties encountered for all participating parties to agree that there existed a problem. This illustrates the frequently overlooked cultural aspect of an institution effort, where the creation of a concensus is the product of building confidence.

Contrary to previously held assumptions the ARB program represented the first major road project for which the BINA MARGA design staff handled the complete survey, performed all the design work, and prepared the related specifications and contract documents.

USAID/Indonesia was not the only donor facing a new set of realities, with the Japanese-financed sector running into similar experiences.

By June 1977 it had been realized that additional survey and redesign work was necessary, but local contractors were unable to acquire the prerequisite seasoned experience in time to perform the required work. The U.S. Consulting Engineer (CE) proposed to assign expatriate design specialists and surveyors to work with the field crews to help make up for some of the lost time and prevent the recurrence of any further costly mistakes. Delayed authorization by BINA MARGA prevented the implementation of this recommendation until recently. It is presently estimated to be about 25 percent completed.

While the ARB project now appears to have overcome its major survey and design-related start-up problems the major lesson to be learned is that all future projects involving an assumed indigenous capability, whether in the public or the private sector, need to test the validity of that premise even more diligently than has been the case in the past, and there probably ought to take place an even greater coordinative effort with other donors to pool and share experiences.

One related aspect deals with the size of task being assigned in a given training situation: The shorter the work cycle (to complete a given repetitive task) the less the probability of committing an error.

Our observations concerning the survey and design of roadbeds

are equally appropriate to that of bridges. For instance: The original design called for bridges to be built with pressure-treated timber. Construction bids received by contractors revealed that reinforced concrete was cheaper because of at least one, if not two factors cited below:

- Lack of available suitable timber
- High cost of timber pressure-treatment
- Longer life expectancy of concrete bridges: 50 years vs. 10 years

Among the technical topics requiring attention were potential safety hazards posed by flimsy hand rails, and the need for more accurate survey data concerning waterway section gradients and catchment areas.

While this resulted in corresponding delays the Mission stated that these were less damaging than those applicable to the roadbeds, in terms of the overall project.

The many implementation problems encountered on this project are not unique and are being experienced by other Indonesian road betterment donors, in varying degrees. They stem from the inherent difficulties in operating at remote locations, under frequently extreme logistics handicaps. This is being aggravated by further expecting local organizations with little experience and a lack of internal resources to carry out complex construction assignments to unfamiliar specifications and quality control requirements.

Generally, the three Indonesian firms, two of which are state-owned, selected to perform this work, were not managed, staffed, equipped, financed, experienced or geared to adequately fulfill their construction responsibilities. The roadway and bridge design issue, in conjunction with the staffing and performance problems of the Consulting Engineer, and the construction companies produced a cumulative result of a very low level of project completion vs. schedule. As of June 1979 the total project was estimated to be only 25 percent completed although work had started in late 1976. Completion status of the three road sections as of June 1979 was, based on composite sources:

ITEMR O A D S E C T I O N S

	I	II	III
FROM	Tapaktuan	Sidikalang	Kutacane
TO	Kreunglas	Kreunglas	Blangkajeren
km	96	117	105
1m (Bridges)	1,760	1,434	1,652
Road Pavement:			
Scheduled	93%	65%	54%
Actual	7%	34%	25%
Actual Paving	None	15 km	"a few" km
Construction		Performance	Limited,
Contractor	Terminated	improved last	because of
		ten months	diversion to
			maintenance
			activities.
Completion Estimate	2 years fol- lowing resumption 1981 (?)	1982(?)	1983
Special Terrain	Minimal	Some moun-	Some mountain-
Features	Difficulties	tainous areas	ous areas

Numerous reasons account for the low rate of progress to date:

- Construction work is constrained by design deficiencies
- Road sections are too large for inexperienced Indonesian contractors to handle on their own.
- Insufficient work supervision
- Construction staff is inexperienced with highway specifications and required quality control.
- High rate of deadline equipment is due to lack of repair facilities, contractor lack of skill in

operating the equipment and providing repair/maintenance with insufficient spare parts.

- Limited contractor financing to accommodate high start up costs and slow rate of reimbursements.
- Diversion of contractor work force and equipment to other work.

Because of the interdependence of the various "factors of production" the slow-down in one element tends to have a cumulative effect on all the others.

Project experience to date has underscored the need for expatriate construction talent to support the on-board Indonesian contractors. The frequent statements by USAID, BINA MARGA and the Construction Engineers, agreeing on such a move, indicate the kind of implementation problems that are inevitable in a multi-organizational effort.

The USAID project evaluation in 1978 noted that one of the "Lessons Learned" demanded that in future (such) project contractors should be required by USAID to retain expatriate expertise in areas in which they are deficient (or weak) prior to contract award. Again, the January 1979 USAID evaluation arrived at the identical conclusion.

In spite of the difficulties the ARB projects finds itself in, and notwithstanding the repeated recommendations made by successive USAID evaluations, BINA MARGA has not moved to accept the advice of reinforcing the workforce with some foreign experts and has thus far insisted on continuing without such support. Our discussions with BINA MARGA officials confirmed their point of view.

Recommendation No. 1

USAID/Indonesia, on the basis of past GOI performance records, persuade the Director General of BINA MARGA to augment Indonesian construction company capabilities with such expatriate supplementary skills as are needed to complete the project within mutually agreed upon time limits.

The Mission declaring that it had already done everything within its power to produce results which are identical to those being advocated by us, wondered whether possibly the combined efforts of all donors (with AID's representing an ever decreasing share) may exceed Indonesia's current absorption capacities.

It is axiomatic that effective equipment operations and adequate repair and maintenance are essential to a sound highway construction project. All three project contractors have lacked this capability, and the need for corrective action has been evident since the project started in 1976.

USAID/Indonesia cited this need to AID/W in May 1977, and again in May 1978. Based on discussions with other lenders, the frequency of those reminders - while adequate by normal standards - may be insufficient under the unique constraints applicable to this project.

While BINA MARGA, Contractors, the Consulting Engineer and USAID agreed in principle to providing three equipment specialists from loan funds the action phase has remained dormant for over two years.

Various solutions offered by the Construction Director of BINA MARGA did not carry that degree of reassurance and finality as to remove all risks from the \$500,000 spare parts management, or the equipment operations themselves. The Mission minimized the exposure by stating that it was taking all reasonable precautions and controls in this respect, adding further, that personnel proposals for providing equipment specialists are currently being reviewed by BINA MARGA and PTE.

Recommendation No. 2

USAID/Indonesia maintain its active involvement in the recruitment of a qualified equipment specialist for each of the three road sections.

BINA MARGA contracted on October 31, 1975 with Louis Berger International, Inc. to provide the project with Consulting Engineering Supervisory Services. The anticipated 57 months

contract period was to provide 161 person months of expatriate, and 4,422 person months of local engineering and support services. Field staffing was to include an Engineer-in-Charge, two Deputy Engineers-in-Charge, and three Resident Engineers, located at the work sites.

The original contract provided for almost US\$1.3 million, an amount which progressively increased to almost \$2.0 million, included almost \$0.5 million of equipment and material.

Local currency costs, with a then prevailing US\$ equivalent value of almost 1.6 million, were to cover Indonesian salaries and in-country support costs, and represented GOI's contribution to the project.

It was planned originally that the expatriate personnel, providing primarily engineering supervision and training of local engineering/technical staff, would be phased out and replaced by Indonesian counterparts as soon as they reached the required proficiency.

The twin problems of project design and construction contractor performance expanded the original role of the Consulting Engineer to include major design services. Due to project slippage, the time frame for his services has been extended.

Under his agreement with BINA MARGA the Consulting Engineer arranged in October 1975 with a local consulting firm, P.T. Asa Engineering, to provide all indigenous staff. This firm experienced difficulties in hiring engineers to serve in the remote project area, at salary rates below other projects in Aceh. It was only in late 1978 that three fully qualified P.T. Asa engineers were on site in support of the Consulting Engineer, an accomplishment which was largely the result of Mission efforts, going well beyond the originally intended scope, and resulted, at one time, in bitter confrontations with the sub-consultant to Louis Berger.

What the degree of future Mission intervention in any project ought to be has been recently articulated by the "More With Less" Doctrine.

CE contract costs have been increased to a level of US\$1.9 million and a matching US\$ equivalent of local currency (computed on the basis that most of it was generated prior to the recent November 1, 1978 devaluation), through Addendum No. 7.

Addenda 8 and 9, upon execution, will further increase total contract costs to US\$2.9 million, and US\$2.3 million, respectively.

The CE has invoiced US\$1.6 million and US\$1.4 million, through June 1979. At the request of the Mission all figures are being reported in US\$ equivalent terms.

There has been considerable indecision, on the part of both the Consulting Engineers and BINA MARGA, to adjusting the CE organization and staffing modes to meet the problems stated in the report:

1. The need to resurvey and redesign bridges and road sections;
2. The inexperience of subconsultants and construction crews.

For instance, the CE Resident Engineer, located on Section I at Tapaktuan, remained on site for 2½ years, from December 1976 to June 1979, at a cost of US\$121,000. Virtually no construction work was performed on that road section during the entire period, and even this nominal activity ended in October 1978. The Indonesian construction contractor has since been terminated.

While we recognize that the minimal performance may have been beyond the Resident Engineer's control we question why he was not reassigned. We were told that since October 1978 his work was limited to a resurvey of the Section I roadway. This means that his productivity during an 8-month period was confined to an effort which reportedly would take 2-3 months, under normal circumstances. Our original 30 percent efficiency computation has since been modified by the Mission revelation that this individual also had certain asset control and disposition responsibilities.

We noted that the CE Engineers previously in charge of the project spent a considerable time, during 1977 and 1978,

in Jakarta, away from the project work sites. This was reportedly on parts procurement, contract issues, contractor claims and other administrative matters, even though other CE staff members were responsible for these activities. The CE employee initially responsible for contracts spent much of his time on project accounting. Perhaps this task could have been performed more efficiently by local accountants freeing him for his contract duties.

The USAID Chief Engineer noted in a July 1978 letter that the role of the Consulting Engineer's resident engineer at job sites "calls for a different attitude than that of primarily monitoring and reporting on contractor's operations and more versatile approach". Improvement of day-to-day operations was needed through daily contact with and guidance to the contractor. USAID concern was again expressed in August, 1978 over CE staff performance at field headquarters, with shortcomings noted in quality control and overall supervisory engineering. Restaffing with personnel possessing more appropriate experience and motivation was recommended, so that the CE would be more actively involved with improving the construction operations of the Indonesian contractors. A key factor cited dealt with a more careful screening of candidates for the CE project staff.

Resident Engineer replacements carried out by the CE on Sections II and III since, have produced some gains in effectiveness, and there has taken place a relative improvement in operations, through a more output-oriented approach.

The project plan anticipated a four-year construction program, concurrent with the training of Indonesian engineers and contractors, who would be qualified to help meet future road building needs. Neither of these objectives are being met. Project construction will take almost twice as long, and the full development of an Indonesian institutional road construction capability is indeterminable at this time. Construction forces are expected to need continued expatriate support, although phase-out of CE personnel has now been scheduled for June 1980.

Project documentation indicates that the emphasis on training of Indonesian work forces has taken some precedence over

timely project completion. This has raised the question as to whether the simultaneous attempt of infrastructure development and institution-building is the most effective approach.

More recently the thinking seems to have changed to specialized training. The USAID January 1979 Project Evaluation indicated the AID funded FY 1980 Feeder Roads Management Project would provide classroom and on-the-job training in improved management and construction techniques for consultants and contractors from the local road construction industry. In February 1979 the GOI Minister of Public Works stated that a special program should be initiated to train national contractors in view of the problems they are having in constructing roads.

The Mission's comments to the Training Section recognized that "a nation-wide, full fledged training program, combining classroom with on-the-job training, is what is really needed in Indonesia". At the same time the Mission claimed credit for doing exactly that, on a smaller scale, on the Aceh Road project, adding, that other donors are becoming convinced of both the need and the value of such training.

A previous USAID/Indonesia Mission-wide audit (Audit Report 76-30, dated August 16, 1976), applied limited coverage to the Aceh Road Betterment project, and noted that the signing of the project loan, authorized on June 28, 1974, was delayed until May 10, 1975 due to some procedural uncertainties dealing with Fixed Amount Reimbursements (FAR).

While the procedures matters were resolved, the use of the FAR method has not resulted in timely loan reimbursement to the GOI for construction costs. The initial FAR payments were processed in July 1979 and covered costs from contract inception based on completion.

The principal distinction between the FAR and the traditional method of disbursement is that FAR reimbursements are not based on actual costs. Rather, the amount of reimbursement is fixed in advance, based upon reasonable cost estimates reviewed and approved by AID. Reimbursement is made upon physical completion of a project or subproject or a

quantifiable element within the project.

It readily follows that absent the attainment of certain predetermined milestone no justification or authorization for payment exists. In many instances problems are beyond the control of contractors or subcontractors, yet under the stated groundrules they are not entitled to recoup their costs. This frequently inflicts severe financial strains on their thinly capitalized companies, and has been known to lead to their failure. Therefore the use of the FAR method, under circumstances containing many uncertainties and uncontrollable variables is a questionable management tool.

The table presented below portrays how the FAR method affected the various road sections.

	<u>Period</u>	<u>Construction Cost Loan Allocation</u>	<u>Loan Disbursement</u>	<u>Com- pletion %</u>
FAR No. 1 Section I	9/76-6/78	\$2,163,043	\$ 156,172	7.2
FAR No. 2 Section II	3/77-12/78	2,821,106	627,132	22.2
FAR No. 3 Section III	3/77-12/78	<u>2,335,793</u>	<u>488,882</u>	<u>20.9</u>
Total		<u>\$7,319,942</u>	<u>\$1,272,186</u>	<u>17.4</u>

This delay in loan reimbursement is primarily due to a lag in GOI submission of requests for reimbursement. Although FAR procedures provide for GOI to request reimbursement four times a year, only two requests have been made since project inception. The second request was being processed by AID at the completion of our audit. Because the reimbursement cycle is now being regularized we have no recommendation. But the fact that such an important aspect of the project was allowed to drift as long as it did, raises some very fundamental questions concerning its overall management generally, and its spontaneous problem-solving response capability, specifically.

Site management often lacked operating funds to keep equipment running while construction workers were paid late or on a partial basis. These practices, not unexpectedly, caused low morale and indifferent work performance, limiting subsequent payments since they, in turn, were based on work

completed. This generated a negative "avalanche effect".

In summary: GOI and AID financing procedures were unable to respond quickly to contractor funding needs. This has been a major impediment, contributing to the slow pace of construction.

BINA MARGA has periodically "borrowed" project construction staff and equipment for other jobs. While activities such as airport construction near Section I work sites, and preventive maintenance of Section III roadway have some functional linkage to the Aceh Road Betterment Project, they have, at the same time, diluted the resources for the principal target, and further retarded its ultimate completion. Under the Mission's basic premise, whereby Aceh Road represents merely one linkage in a vast area Basic Human Needs grid, our observation concerning secondary vs. primary beneficiary may be developmentally academic, containing both "plus" and "minus" elements. Because of such judgmental aspects we offer no further comments or recommendations.

Peripheral development activities which do not benefit directly the project for which its resources were intended and authorized consistently pose a dilemma for the trustee/manager in charge.

The many inter-organizational relationships involving various entities of the Government of Indonesia, USAID/Indonesia, contractors and subcontractors, in a remote multi-location setting, have posed unusually complex and unique day-to-day management problems.

There exists a vast literature chronicling the many meetings, site visits, reports, etc. dealing with the various problems the project encountered since its inception. The files contain many proposals for resolving the issues cited. Under normal circumstances such problem-solving efforts would have resulted in demonstrable results, within a shorter time-frame.

In order to eliminate any and all uncertainty concerning the respective roles to be played by all participating parties, against a realistic time-scale, together with adequate assurances that overrun funding will be available,

as needed, from the GOI, we offer the following two recommendations:

Recommendation No. 3

USAID/Indonesia convene a meeting between all parties having a sponsor or performer relationship to the project, and obtain a mutually agreed concensus concerning completion of the project.

Recommendation No. 4

USAID/Indonesia cause the Government of Indonesia to prepare an update of the overall financial requirements to be funded from sources other than AID loan proceeds. This should be accompanied by a committment that the Government of Indonesia has included the required Indonesian Rupiah requirements in the appropriate annual budgets.

EXHIBIT A

USAID/Indonesia
Loan No. 497-T-036 Aceh Road Betterment
Financial Status as of July 31, 1979
(000 Omitted)

<u>Letter of Commitment</u>	<u>Committed</u>	<u>Disbursed</u>	<u>Pipeline</u>
Louis Berger, Intl.	\$ 1,968	\$ 1,267	\$ 701
Fixed Costs Reimbursement Construction Contracts	2,000	1,272	728
Steel Reinforcing Bars	<u>578</u>	<u>578</u>	<u>-</u>
	\$ 4,546	\$ 3,117	\$1,429
Uncommitted Amount ^{1/}	<u>5,754</u>	<u>-</u>	<u>5,754</u>
Total Loan	<u>\$10,300</u>	<u>\$ 3,117</u>	<u>\$7,183</u>

1/ Earmarked for construction costs \$5,320; Contingencies \$434

REPORT RECIPIENTS

USAID/Indonesia

Director 5

AID/W

Deputy Administrator (A/AID) 1

Bureau for Asia:

Assistant Administrator (AA/A) 1

Deputy Assistant Administrator (Audit
Liaison Officer)
Office of Indonesia and South Pacific/
Asean Affairs (ASIA/ISPA) 1

Bureau for Development Support
Office of Development Information and
Utilization (DS/DIU) 4

Office of the Auditor General:

Auditor General (AG) 1

Executive Management Staff (AG/EMS) 12

Policy, Plans & Programs (AG/PPP) 1

Office of Legislative Affairs 1

Office of Financial Management (OFM) 1

Office of the General Counsel 1

Area Auditor General:

AAG/Washington 1

AAG/Africa (East) 1

AAG/Egypt 1

AAG/Latin America 1

AAG/Near East 1

OTHER

Auditor General, Inspections and Investigations
Staff (AG/IIS/Manila) 1