

ASSESSMENTS OF SIX AID-SUPPORTED PROJECTS:

1. Provincial Water (Philippines)
2. Libmanan-Cabusao Integrated Area Development (Philippines)
3. Semarang Steam Power Station (Indonesia)
4. Educational Finance (Indonesia)
5. Population Planning (Thailand)
6. Small-Scale Irrigation (Bangladesh)

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METHODOLOGY AND SUMMARY OF ASSESSMENTS

Since all of the six projects selected for this study were intended to produce socioeconomic innovations, assessment necessitated conceptualizing a before-and-after situation in order to measure the effect of project implementation in producing the desired change.

The first step in doing this was to reconstruct the historical setting of each project. Specifically, this involved investigating the problem which prompted the formulation of each project and defining the anticipated impact of the project on the intended beneficiaries. This was done by collecting documentary data (Project Identification Documents, Project Papers, and other records) and also by conducting interviews with those familiar with each project.

The next step was to focus on project implementation and determine (again through documents and interviews) whether it had proceeded to the point where some manifest impact had been produced. Where this was the case, interviews were conducted with intended beneficiaries to obtain their perceptions concerning the positive or negative effects the project has had on them and their surroundings.

For those projects where implementation had not reached the stage where there was a measurable impact, the interviews were geared to assess the anticipated impact of the project.

Applying this method, the resulting assessments were attained.

1. Project No. 1, Provincial Water in the Philippines - This project was assessed to have produced more positive effects (which are permanent and more likely to increase) than negative effects (which are short-run in nature). Positive effects such as improved water quality, stronger pressure, a more reliable supply, and more accessible sources are contributing to the well-being of the intended beneficiaries.

The improved water systems also are contributing to socioeconomic development in the beneficiary communities. Negative effects such as higher water rates are considered temporary.

2. Project No. 2, the Libmanan/Cabunao Integrated Area Development in the Philippines - The overall conclusion is that most of the targeted beneficiaries see the project favorably at this time, although the actual results are still quite mixed. It therefore is too early to judge fairly what the final impact will be. Intermediate beneficiaries (including some unintended beneficiaries) such as laborers working on the project, contractors, and fishermen, are relatively content. Final beneficiaries - the farm households - have, in general, high expectations about the final outcome of the project, although most have experienced only a small amount of benefit to date. Some have experienced serious costs as a result of poor implementation management.

3. Project No. 3 - The Semarang Steam Power Station in Indonesia - Despite the undue delays in getting the first unit of the plant operating in October 1978, there have been some manifestly positive results that give the project a promise of success. The most striking

of these results stem from the fact that implementation of the project thus far vastly reduces the possibility of blackouts which have been plaguing the PLN grid system of Central Java.

This new reliability has attracted a large number of new users, among them various types of commercial and industrial establishments, which previously maintained their own generators (most of them diesel-fueled). There are indications that the new PLN system has stimulated an expansion of some businesses, which contributes to the economic development of Central Java and the creation of more jobs. There also is evidence that the reliability of power has improved the operation of some health facilities (particularly the larger hospitals). Finally, the addition of the Semarang Steam Power Station enables expansion of the rural electrification program in Central Java thereby benefiting villagers and farmers.

Negative reactions centered on the high cost of service connections and conversion to 220 volts, and also the high electricity rates. The lower cost of fuel for the steam plant (.23-.24 liters per watt hour) in comparison with the gas turbine generators (1-4.6 liters per watt hour) should lower overall operating costs, enabling a reduction of these costs.

4. Project No. 4, Educational Finance in Indonesia - Our overall conclusion is that top-level decision-makers in the Ministry of Education and Culture and the people directly involved in carrying out the project are very satisfied with the results to date.

Decision-makers know a great deal more about what the country's educational system is like than do other officials. They are aware of the flow of funds and what must be done to improve the system with the available funds. The people trained by the project-- participants in training courses, those versed in computer skills, in languages, and in research (techniques and analysis), those experienced in field work, and those whose educations have been financed by the project -- all constitute a solid core of expertise which Indonesia badly needs.

5. Project No. 5, Population Planning in Thailand-- This project was adjudged to be successful. Seen in historical perspective, AID's initial support in 1970 had been catalytic in enabling the Royal Thai Government (RTG) and private sector agencies to launch family planning programs either on a regional or national level. Since 1970, AID has been attuned to the needs of the population planning program so that its support has continued to be significant.

The most significant measure of the success of this program is that population growth has been reduced from +3.0 percent in 1970 to 2.1 percent in 1978.

6. Project No. 6, Small-Scale Irrigation (Hand Pumps) in Bangladesh was the only project to which the methodology did not apply because none of the hand pumps in the AID-supported program has been manufactured. In the absence of sufficient implementation, the alternative was to examine the impact of a similar hand-pump project being conducted by UNICEF (as of 1979, some 90,000 hand pumps have been distributed).

On the basis of this research the proposed hand-pump project supported by AID appears to be promising in terms of the stated goals. On the positive side, use of the pumps will permit a dry-season crop, which will enable many small landowners to retain title to their holdings where under previous conditions their ever-increasing debt would eventually force them to sell their land. The simple technology of the pump renders it easy to use and maintain. The flexibility of the pump permits it to be used for household water as well as for irrigation, and the crop rotation it affords is beneficial to the soil. The command area is relatively small, so there is little waste of water.

There are questions, however, concerning cost effectiveness of the project (increased production means higher costs to the farmer and lower prices locally). Also is there a possibility that large landlords might gain control of the new pumps (as they did with chemical fertilizer in some areas)? Then to us what will be the effect of a vastly increased number of pumps on the water table?

Project No. 1 -- PROVINCIAL WATER -- (Philippines)

1. 1974 Loan 492-U-033 of \$15 million was made to the Government of the Philippines for use by the Local Water Utilities Administration (LWUA).

2. Purpose of the Project:

A. Goals: The Provincial Water Project (AID-DLC/P-2020) was originally formulated with two goals: (1) the development of water systems in up to five selected cities which would provide safe water (there were problems with potable water) on a reliable and economic basis to a significant portion of the population; and (2) the development of the technical and institutional capacity to extend such service to other cities in the Philippines. The original urban areas selected were Cagayan de Oro (Mindanao), Davao City (Mindanao), San Pablo (Luzon), Tacloban City (Leyte), Bacolod City (Negros Occidental), and Baguio (Luzon). Eventually, Baguio was deleted, and the provincial water projects were implemented in the other cities.

B. Beneficiaries: The immediate beneficiaries of the project would be the residents of the urban communities concerned. The improved quality of the city water would affect health standards (particularly in terms of waterborne diseases and personal hygiene) positively. Up to the time the project was formulated, secondary cities in the Philippines had lacked the institutional capacity to develop safe and reliable water supplies.

The project also would serve as a model for similar water projects that could be extended to other towns. There are approximately 300 communities in the Philippines of 30,000 population and they are in need of safe and reliable water supply systems.

C. Schedule: The Project Paper was dated March 13, 1974, and the Loan Agreement was signed on May 23, 1974. By the beginning of 1979, most of the new water systems in the five selected cities were functioning.

3. Assessment:

A. General View: On the basis of research conducted in two (San Pablo and Cagayan de Oro City) of the five cities included in the Provincial Water Project, we found that on balance the project has produced more positive results than negative results. Moreover, the vast majority of the negative effects are short-run in nature, while the positive effects appear to be both more permanent and more likely to increase.

Although it is too early to measure the impact of the project on the health of the ultimate beneficiaries, we found our respondents to be generally pleased with the improvements they have experienced in water quality, pressure, and reliability, and with the greater convenience afforded by a private or nearby public water outlet. Their complaints centered on the higher rates they often have to pay, with some inconveniences (both temporary and permanent) brought on by the new water systems, and with water district management problems.

We also found indirect evidence that the Local Water Utilities Administration (LWUA) is in fact helping to develop more independent local water districts and supplying training to local employees. Some respondents, however, felt that the LWUA's loans to the local districts carried unduly burdensome terms, with the intent being to build up LWUA's staff in Manila at the expense of local water districts.

for example, consumers with ½" pipe connections had their basic service charges increased five-fold between 1973 and 1979, while consumers with 3" pipe connections had their rates increased thirty-fold. Large users are thus increasingly subsidizing small users. Furthermore, commercial and industrial water rates in this city are double the residential rates. As we noted in our overall assessment of the Provincial Water Project, the net effect is similar to that of a progressive income tax.

(B) Negative Reactions: Negative reactions concerning the new water systems centered for the most part on the higher rates, and the intensity of opinion in this regard varied. Others reacted negatively to inconveniences imposed by the new system. There were poor families who had lost their water taps. Interviewees complained of pipes bursting because of the new higher pressure and also about the disruptions caused by streets and roads being torn up for repairing pipes or laying new piping. Finally, there were complaints about water district management (particularly concerning the funds spent on such things as new administrative buildings.)

(1) Higher Water Rates:

(a) In San Pablo, a woman operating a small street shop complained that whereas her monthly bills averaged around P6 (83¢ U.S.) a year ago, they now were as high as P30 (\$4.14). Her January 1979 bill was P20.80 (\$2.87). She said she could not charge higher prices for her goods because her customers were close neighbors and friends, so she based her prices on what others were charging.

(b) A group of San Pablo primary school teachers reported that although their monthly salaries had remained at P574 (\$79.17) their household water costs had risen considerably; this

was more of a burden for male teachers than for most female teachers (who had husbands with incomes.) One teacher reported that her water bill had risen from around P20 (\$2.76) to P32 (\$4.41), while another claimed that her January 1979 bill (for a household consisting of just her and her husband) was P98.80 (\$13.63). A male teacher with a wife and two children (both of whom drank milk, a relatively expensive commodity) related that the rise in water rates coupled with other price increases had forced him to raise chickens to sell and drive a motorized "tricycle" taxi on weekends to supplement his income.

(c) The owner of a small snack shop in San Pablo complained that while the water pressure had improved, his monthly water bills had increased from P32 in January 1978 (\$4.41) to P78.43 in January 1979 (\$10.82). He has been forced to increase the prices of his goods -- e.g., a banana split that previously sold for P5.65 (78¢ U.S.) now was priced at P5.70 (79¢ U.S.) In addition, the new higher rates had prompted him to have a separate residential tap installed in his home rather than having it part of the commercial connection as it had been before.

(d) In Cagayan de Oro City, the woman who owned four apartments claimed that her water bill had gone from P25-30 per month (\$3.45-\$4.14) to P249 in January 1979, plus a P50 surcharge (\$41.24 in all) but she also said that she liked the new water system for its quality and convenience. She did complain about having to pay commercial rather than residential rates, but it was an amiable complaint and she left the impression that a rent adjustment had been made to ease the strain on the family's budget. Her tenants were comparatively high income people, too--she charges them P500 per

fall evenly: squatters tend to be better off in general, businesses are less affected because water is normally not one of their major costs, and fixed-income middle and upper classes are probably hurt the most. This, of course, is in the nature of any structural change, and structural change is the essence of development, either economic or social. The ultimate test is still the response of the community as a whole, and in the case of this project, it was overwhelmingly favorable.

1. 1975 Loan 492-T-037 of \$3.5 million to the Government of the Philippines (GOP) for the Libmanan/Cabusao Integrated Area Development Project (AID 492-0275).

2. Purpose of the Project:

A. Goals: The project is the first attempt at application of the integrated development approach focusing on a specific geographic area within the Bicol River Basin. The project involves developing operational irrigation and drainage systems complemented by improved farmer group organization and extension services as part of a unified effort. It also entails the establishment of an organizational structure and management system to facilitate coordinated participation of technical agencies and local leaders in an area-specific development project. This will enable municipal leaders and residents of Libmanan/Cabusao (along with national and provincial level agencies) to meaningfully participate in the Bicol River Basin programs.

B. Beneficiaries: The project is aimed at the two communities of Libmanan and Cabusao, encompassing an area of 3,873 hectares. For the 2,500 small-scale farms in this area, a system of improved irrigation, drainage and water management facilities will permit two rice crops per year. Improved farm practices, extension services, transport, land tenure arrangements, and marketing services will aid in this development. Farm production and farmers' incomes will increase, and there will be a concomitant increase in demand for on-farm employment.

C. Schedule: The loan was authorized on June 28, 1975.

As of October 30, 1979, \$218,517 had been disbursed. Terminal date for requesting commitment was extended to July 31, 1980, and the TDD has been extended to January 31, 1981. The project has experienced a series of delays due in part to unfavorable weather (typhoons) and to a lack of Philippine inter-agency cooperation.

3. Assessment:

A. General View: Our overall conclusion is that most of the targeted beneficiaries see the project favorably at this point in time, although the actual results are still quite mixed, and it is too early to fairly judge what the final impact will be. Intermediate beneficiaries like laborers working on the project, contractors, and fishermen, are quite content. Some of these are unintended beneficiaries, experiencing gains which were not anticipated at the outset. Final beneficiaries -- the farm households themselves -- have, in general, high expectations about the final outcome of the project, although most have experienced only a small amount of benefit to date and some have experienced some serious costs.

B. Physical evidence of the project is very apparent in the area. We saw roads, dikes, irrigation and drainage canals, pumps, laterals, terminals, and office buildings.

C. Host government support is continuing. There are still problems of poor communication disputes over responsibility, lack of coordination, conflicts of interest, and lack of incentive, and there is still too much decision-making in Manila and not enough in the Bicol region. But there has been some decentralization and cooperation is slowly improving.

(2) New Roads:

(a) Daniel, a laborer on the pacquiao team digging Lateral Channel B, pointed out that the new road running parallel to the channel has had some beneficial effects on the population. His barrio is now more accessible and traffic has increased. More products are now available in the barrio, and access to the poblacion hospital has benefitted everyone.

(3) Pacquiao (a scheme to have small local contractors hire available laborers for the construction projects.)

(a) Lateral Channel B is under construction as part of the project, and it is being dug using pacquiao labor. Mr. Puna, the contractor for the work crew pointed out that the pacquiao system supplied a good deal of employment during the dry season, when jobs are relatively difficult to find. During the planting season, the pacquiao workers return to the paddy fields where most of them work as hired laborers. This contractor, with five men working on his team, was making the equivalent of \$5 per day, suggesting that income was being reasonably equally distributed by the system. About 50 contractors are currently working in the Libmanan/Cabusao area.

(b) A 41 year old pacquiao laborer with eight children, works during the dry season as a canal digger and during the planting season as a farm laborer. He has no land. The canal digging day is 8½ hours at the pay scale of P10 (1.39) per day. He is happy to have the work, but he finds it very tiring for such a low wage, and he noted that his standard of living has not improved with this extra work.

(4) New Fishing Opportunities:

(a) A young fisherman in his 30s, together with his wife, children, and uncle moved into the Libmanan/Cabusao area in July, 1978, from Quezon province and have found the fishing better and their standard of living better here. Their house is right next to the flood control dike, but they reported that a flood which had come with the most recent typhoon had drained by the following morning. Nearby farmers like the dike, they said, and flood waters recede fast because of outlets in the dike. Moreover, they catch shrimp brought in by the tide in a low catchment area next to the dike by plugging the outlets (when the NIA unplugs the outlets, they plug them back up.) They even use the catchment areas as fish farms, leaving the small shrimp alone until they grow big enough to market. They also catch mudfish, mullet, and gourame in nearby fields after typhoons, but shrimp bring the best price. This is a net addition to their income, also, because they still go out in their boat as often as ever; they tend to do their catchment fishing when the water is too rough in the bay for their normal fishing activities.

(b) We also talked briefly with three farmers fishing with a net in a drainage canal near Barceloneta. They were catching carp, small cutfish, and soft-shelled crabs, both for their own use and for sale. They said that they could catch more fish after floods now than they could before the project began. They estimated that the three of them had caught about \$4 worth with a couple of hours work on a Friday afternoon; this, of course, was during the dry season.

(5) The Bulalong Bridge: (AID-assisted, but not part of project.)

(a) A paddy farmer from Barrio San Juan in the area affected by the newly opened Bulalong Bridge, a Bicol River Basin project, expressed enthusiasm about it. He expressed the view that it would now be possible for him to transport his paddy to the Naga City market rather than sell it at a nearby market as usual, and he reasoned that this would bring him a higher price.

(b) A 64 year old paddy farmer in Barrio San Juan also praised the new bridge, pointing out that it cut his travel-time to market by more than half. He also can take any sick family member to Naga City in much less time. Generally, the new bridge gives him a "feeling of convenience." He also spoke of people he knew whose standards of living rose as a result of their being laborers working on the bridge construction.

(c) A Barrio San Juan farmer in his early forties reported that he no longer has to carry his produce on foot over to a railroad to be hauled into Naga City on a "skate," (a motorized platform about the size of a handcar); but can load it on a vehicle right in front of his house.

B. Negative Reactions:

(1) Delay in Project Implementation:

(a) A 64 year old small farmer living near Libmanan was very critical of some aspects of the project. He said that he had not been able to harvest a crop of rice since 1974 because of a dispute between a landowner and the National Irrigation Administration (NIA). The pump he relied on was located on this landowner's property, but the pump was operated by the NIA. The NIA kept promising payment for the land to the landowner, but delays in processing the

necessary papers held payment up until January 18, 1979. In the meantime, the landowner would supply water for a while, then arbitrarily shut it off -- often just before planting or just before the rice was ready to "make." The farmers depending on this water would there upon lose their crops. The farmer also said that the NIA dug their main irrigation canals too deep, so that too much fuel is needed to fill them to the level where it can flow into the fields; he also felt that the canals had been misrouted in some cases, and that if the NIA had consulted local farmers first, it could have avoided some of these complications. He has also experienced worse flooding since the project began: before the dikes, canals, and roads were constructed, his locality normally would be flooded for only three days and to a depth of only one foot or so when heavy rains came; after the construction, the water stayed for a week or more and rose to a level of 2-3 feet, destroying their crops (and in some cases their animals) before it receded. (In fairness, we should note that rains were unusually heavy in the upper Libmanan River area this past year.) He also complained that there are too few guidelines on how irrigation water is to be distributed, with the net result that neighboring farmers fight over the available water.

(b) Another paddy farmer in Barrio San Juan, the owner of 13 hectares complained that the dispute between the NIA and the owner of the land on which the Handong Irrigation Pump stands, resulted in his loss of irrigation water. Whereas in normal years he would harvest two paddy crops, each of 70 cavans (or 350 kilos), lack of sufficient water has prevented any crops in 1978.

(2) New Road and Canal Construction: Maria, who was Case #5 in our 1977 study, The Rural Poor Majority in the Philippines: Their Present and Future Status as Beneficiaries of AID Programs, is a farmer in Barangay Mantlisa, Libmanan. She had complaints about the road and canal construction (the canal still is being built). She and her husband had lost some 5 meters of their paddy land, and their irrigation stream was filled in. Now they find that the canal is "too high" for them to use for irrigating, so they have been forced to dig their own well in order to have water for the paddy. Also, their drainage has been affected by the new canal (which they contend runs the wrong way) so that 1/3 of a hectare is constantly flooded. They have a formal protest filed with the NIA. When they pointed out the flooding to the project engineers, they suggested that Maria arrange it as a fish pond. Angered by this, she replied that she wanted paddy, not fish.

(3) Badly Planned Irrigation Ditches and Channels: A 47 year old paddy farmer with 13 hectares in Barrio San Juan, Libmanan pointed out that the project engineers planned and constructed some supplementary channels in his area that are not used because they are badly placed. The local farmers, he felt, should have been consulted about the placement of the channels.

(4) The Dike Project (Protective Dikes #1 and #2): A paddy farmer with 13 hectares in Barrio San Juan, Libmanan, noted that while the dike kept out the brackish intrusion, particularly during the April-May period, the small size of the flood gates during the typhoon season (September-December) inhibited good drainage so that too much water remained in the paddy fields, sometimes also causing flooding.

Project No. 3 -- THE SEMARANG STEAM POWER STATION -- (Indonesia)

1. 1971 Loan 497-H-024 of \$19.7 million to the Government of Indonesia for the Semarang Steam Power Station.

2. Purpose of the Project (AID-497-0240):

A. Beneficiaries:

(1) The immediate beneficiary of this project is the Perusahaan Listrik Negara (PLN), a utility wholly owned by the Government of Indonesia. The project involved the design and construction of a thermal power station in the Central Java city of Semarang. The station was planned to contain two semi-outdoor oil-fired, non-reheat pressurized steam generators and two 50-MW condensing turbo-electric generators. The boilers were designed to fire residual fuel (Bunker C). Units are cooled by a circulating water system drawing from and discharging into Semarang harbor.

(2) The ultimate beneficiaries are the 25 million people living in Central Java. The stated aim of the project is to establish the basis for: (a) substantial growth in all sectors of electric power consumption, and (b) increased confidence in purchasing electric power, thus providing for greater industrial and commercial consumption as a main corollary to economic development of the area.

The Semarang Steam Power Station was seen as a key project in the plan to develop a power grid throughout central Java as part of an interconnected system that eventually would give all of Java electric power at a reasonable rate. It will provide the wherewithall to realize the recently formulated Central Java rural

Electricification Project (supported by AID), which will enable 200,000 new customers, consisting of some of the poorest farmers in the area, to be able to have electricity at rates that they can afford.

B. Schedule: The project was initiated in 1971 with initial operation of the plant planned for early 1973. Numerous delays forced postponement until October 1976. As of March 1, 1978, 92 percent of the general construction was complete. The submarine pipeline to bring oil to the plant fuel tanks, however, was only 15 percent completed as of this date, so the start-up of Unit No. 1 was set for May 1, 1978. The start-up did not take place until October 1978. The start-up for Unit No. 2 was scheduled for May 15, 1978, but as of February 1979, this unit still was not functioning.

As of November 30, 1978, \$17.9 million of the loan had been disbursed, leaving \$1.8 million as unliquidated. The terminal disbursement date is October 30, 1979.

3. Assessment: Despite the undue delays in getting the first unit of the plant operating in October 1978, there have been some manifestly positive results that give the project a promise of success. The most striking of these results stem from the fact that implementation of the project thus far vastly reduces the possibility of blackouts, which previously have been plaguing the PLN grid system of Central Java.

This new reliability has attracted a large number of new users, among them various types of commercial and industrial establishments, which previously maintained their own generators (most of them diesel-fueled.) There are indications that the new PLN system has stimulated

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an expansion of some businesses, which contributes to the economic development of Central Java and the creation of more jobs. There also is evidence that the reliability of power has improved the operation of some health facilities (particularly the larger hospitals.) Finally, the addition of the Semarang Steam Power Station enables expansion of the rural electrification program in Central Java thereby benefiting villagers and farmers.

The lower cost of operating the fuel for the steam plant (.23-.24 liters per watt hour) than the gas turbine generators (1-4.6 liters per watt hour) will enable lower overall operation costs, thus eliminating the negative effect of high service connection fees and higher power costs for the commercial users who have converted from their own generators.

A. Positive Reactions:

(1) Greater Reliability:

(a) In 1977, management of the P. T. Bonanza Mega Ltd. plant for refining crude copra oil into cooking oil decided to shut down their two diesel generators and purchase power from the PLN despite the fact that it would cost from 10-15 percent higher. Increased competition was a factor, and the managers were attracted to the new reliability of PLN power with the anticipated operation of the Semarang Steam Power Station. They reasoned that the improved power would allow them to expand their operation. They also figured that continued reliance on their own generators would be increasingly costly as fuel prices inevitably rise as would generator maintenance costs (spare parts are expensive and often difficult to obtain.)

(b) Mr. P. T. Cejamp, manager of the Central Java Mariner Products Company (a joint Japanese-Indonesian venture) that processes fresh shrimp which are frozen and shipped to Japan, spoke favorably about the reliable power now provided for twenty-four hours by the PLN as a result of the operation of the steam power station. He was hesitating, however, about switching from his own five generators to the PLN system because he felt that the service connection fees were too high. He pointed out, nonetheless, that in the long run, the initial outlay for the connection would be worth it because fuel costs are rising as is the cost of maintaining his own generators. Mr. Cejamp was considering a compromise wherein he could use the PLN power during the daytime and switch to his own generators in the evening when the PLN rates were higher.

(c) A small government health clinic in Semarang specializes in child care, midwifery and family planning. The clinic always relied on PLN power, but the frequent blackouts necessitated their having gaslamps (L.P.G.) and kerosene refrigerators for storing medicines. With the reliability of the new system they feel confident enough to purchase electric refrigerators.

(d) St. Elizabeth's Hospital, established by Catholic Dutch Nuns of the Order of St. Francis in 1927, has used PLN power since it was founded, but the many failures prompted them to have their own generator (70 kv) which they used very frequently. Now the hospital is being rewired for 220 voltage, and the electrician noted that they would no longer use their own generator (although they will maintain it) because of the reliability of the new PLN power.

(e) The ABC Bakery supplies bread and rolls to vendors throughout Central Java. The business was begun in 1971 with 20 workers, and it used PLN power. Frequent blackouts, which hampered operations (work stoppages resulted in dough going sour) prompted the management to buy their own 100 kv diesel generator. Sales increased, and by 1979, the company had 250 workers (including salesmen.)

In 1977, a new bakery was opened at Ungarawan, some 22 kilometers from Semarang, and it is four times larger than the original facility. A 159 kv diesel generator supplies power to the new bakery, but since there have been frequent power failures, the management is planning to buy electricity from the PLN system. The manager pointed out that the PLN was constructing a new transmitter nearby, and because of the reliability of the PLN power now that the new Steam Power Station was operating, he planned to have a service connection installed.

B. Negative Reactions:

(1) High Fees and Rates:

(a) Mr. P. T. Cejamp, manager of the Central Java Mariner Products Company (noted above), complained that the high service connection fee charged by the PLN was giving him pause about purchasing power from them. He pointed out that if he purchased power it would mean a greater profit for the PLN, so they should make it more attractive by charging less for the connection.

(b) The manager of the ABC Bakery pointed out that despite his decision to buy PLN power for his new installation (discussed above), he could not do so for his older Semarang bakery because the electricity rates were too high. Ordinarily he could pass the increased cost on to his customers, but this year sales have fallen in the rural areas because of the long rainy season (his customers, most of them farmers, buy rolls flavored with margarine and extracts of "mocca," "durian," and "strawberry") and competition has become too intense.

(c) A Chinese woman in her mid-forties runs the Poo-Liem Machine Shop, which specializes in repairing gears for large machines. She would like to buy power from the PLN, but the cost of converting from 110 volts (she has a 70 kv generator) to the 220 of the PLN system is too costly. She also fears the 220 volts may be "too strong" for her equipment.

Project No. 4 EDUCATIONAL FINANCE IN INDONESIA

1. 1975 grant funds of \$425,715
2. Purpose of the Project (AID-497-0229)

The Educational Finance Project is aimed at establishing in BP3K (the Department of Research Planning of the Ministry of Education and Culture) and in planning units in selected provinces, a capability to define and evaluate criteria for determining an equitable allocation of Government of Indonesia (GOI) funds budgeted for education. This is intended to increase access to educational opportunities for children, youth, and adults, particularly those in rural areas.

A. Beneficiaries - Direct beneficiaries are educational planners in the Ministry of Education and Culture, provincial education officials, and those trained by the project itself. Indirect beneficiaries are teachers, school-age children, and the general public.

B. Schedule - The project began on May 1975 and the completion date is May 1978, with the exception of the Work-Experience Paper, which is due April 1979.

3. Assessment:

Our overall conclusion is that top-level decision-makers in the Ministry of Education and Culture and the people directly involved in carrying out the project are very satisfied with the results to date. Decision-makers know a great deal about what the country's educational system is like, where money is presently coming from and going, and

what must be done to improve the system with the funds available.

The people trained by the project--participants in training courses, those who have learned computer skills, languages, research techniques and analysis, those who have acquired experience in field work, and those whose educations have been financed by the project--constitute a solid core of expertise which Indonesia badly needs.

A. Physical evidence of the project's existence is apparent in three senses. First, there are a variety of reports, both in Indonesian and English, in existence with more in the final stages of preparation. Second, there is a research team, headed by the project coordinator, which is still intact. Third, there is office space allocated to the project, and there are computer tapes containing the data the project collected.

B. Interview Data

(1) The Chairman of the Department of Research Planning in
the Ministry of Education and Culture

This official reported that the country was having great difficulty trying to plan educational expenditures in pre-project days. They either had bad cost and financing data or none at all. Individual schools either had virtually no accounting procedures or very primitive ones. The result was too much wastage of funds and effort and no means of adjusting the types of education to the needs of the country.

Basically, funding for schools in Indonesia comes from four sources: official school fees, unofficial school fees (levied by teachers to meet special outlays), local government support, and national government support. National planners needed to know how much money was being collected and where it was going. The project began with special surveys, using forms designed beforehand but supplemented by visits to the field to find nuances that structured forms cannot capture (this information was volunteered, not elicited from them). These surveys were coupled with longitudinal studies of what happens to people after they leave school in an attempt to relate expenditure levels and patterns to later work, employment, and further schooling experiences in order to give some feel for costs and benefits.

The Chairman said that a very good data base has now been established and that the problem has become one of translating the

data into useful decision-making. (This point was echoed independently by several top Ministry people.) Even so, a number of benefits have already emerged. The Ministry has some idea of the size and nature of educational problems. For example, it learned that the country spends almost ten times as much on uniforms as it does on books. It also discovered that private schools have lower costs than public schools because, apparently, of lower overhead-fewer frills. It found a high incidence of multiple teaching jobs among better teachers. It turned out that students attending private schools are not notably different from those attending public schools in income, sex, and so forth.

One very potent fact brought out in the interview is that education people in Indonesia feel that they are being unjustly blamed for high unemployment rates. In fact, there is evidence that unemployment does tend to rise with the level of schooling; educators attribute this to a widespread perception among people that education is the path to higher incomes. The solution, obviously, is a better match between type of education and the jobs available, and educators do bear some responsibility in improving that match.

(2) The Secretary of the Department of Research Planning

This official pointed out that the Department would soon be receiving the services of a U.S.-trained Ph.D. in educational economics whose schooling was financed by the project, with still another due in another eighteen months or so. Some of his staff had had their research skills sharpened by participation in the project, project reports have been used as training materials in short courses on educational finance, and he felt that local schools were benefiting from improved accounting practices stemming from the reports they must make to the Ministry. He, too, noted that the government has still not made full use of the data available, however. Some people still do not know the data exist or how to use them, and there are always political problems impeding the changes which the data suggest are necessary.

The Director of Research told us that the project's study tracking school dropouts would be continued with support from UNICEF, and that surveys were planned which would add more socio-economic data to the study so that an intervention strategy could be devised. He reported that the Committee for Educational Reform had found the reports already generated by the project very useful, and that the Task Force for the Preparation of the Draft Plan for Repelita III was using them. He felt that the dropout study would be especially helpful in reducing the numbers of future dropouts; he was proud of the fact that this was the first "tracer study" done in Indonesia, and that the study had had an 88% response rate to a postcard questionnaire (which was later followed up by a personal interview). He also said that the

project had solicited the inputs of headmasters in designing report forms, and that this participatory approach was something of an innovation in the country.

We also got a very positive response from a Ministry employee who had participated in a number of educational finance training seminars and field trips outside Indonesia which were sponsored by the project. He said that the project was very good. The only weakness that he saw was the time given to administrative matters by AID, particularly at the outset of the project. He was finding the data and the experience both very helpful, and he mentioned that the Ministry was going to conduct further studies of private schools, using the approach developed by the project.

(3) The Project Coordinator

The Educational Finance Project's Indonesian Coordinator emphasized the project's value by noting various facts that special studies had turned up: Indonesian class hours are very short, only slightly more than half that of other southeast Asian countries; there is heavy use of classrooms in urban areas, with public and private schools often using the same building at different hours of the day; there is relatively poor utilization of rural classrooms; multiple job holding is concentrated among the better teachers of particular skills (math and science) pointing up where the emphasis needs to be placed in teacher-training institutions; graduates of vocational schools have more difficulty finding jobs than graduates of general schools; there is a high incidence of grade repetition in Indonesia, and a large spread of ages in a given grade; almost half

of school leavers who secured jobs reported that they received them because of koneksi (connections); lack of information resulted in the Ministry's supplying equipment requiring electricity to many schools which lacked it; building costs of schools in Indonesia are as much as 6 times higher than in other countries after adjusting for quality and size; teachers on average are paid less than a living wage, and many of them have been double-counted because of multiple job-holding; and so forth.

(4) A Former Project Staff Member

To get more of an outside view of the project, we interviewed a man who had worked on the project, but had left to accept a position with a private research and management consulting firm. He had served as the project's computer expert, but had also done field work (mainly on the school leavers subproject). He had not been an expert when brought into the group, but learned as he went. He attributes his present job to the expertise he gained from the project. He had a great deal of faith in the validity of the data, based both on the fact that he helped direct and participated in the field work, and because postcard returns were coupled with visits to respondents. He noted that they surveyed 12,000 people altogether in the school leavers subproject, and that the study was quite an innovation in Asia. He said that he makes more money now than he did working on the project, but was altogether happy about being a part of it.

(5) A School Headmaster

Finally, to get some idea of what local school administrators thought about the project, we interviewed the headmaster of a lower (7th-9th grade) state secondary school with a general curriculum. He said that the project is helping the education ministry administratively and that special studies like that on school leavers are' especially helpful in deciding on curriculum changes to improve job chances for students. He found some of the questions on the reporting forms confusing, however, and he had had no feedback from the Ministry on the forms he has submitted. He said that processing the forms for the Ministry is not a particular burden; it is performed routinely during regular school hours. He had not made any changes in his own accounting system, although we did hear of other schools which had done so.

Project No. 5 POPULATION PLANNING IN THAILAND

1. 1976 grant funds of \$16,607,000 to the Royal Thai Government (RTG).
2. Purpose of the Project (AID 493-0283)

This is the most recent segment of AID's support of the family planning program. AID project 493-0266 began in 1970, when the Thai National Family Planning Program was launched, and it continued until 1975.

The purpose of this project is to attain an annual population growth rate of not more than 2.1% by the end of 1981, as specified in the fourth Royal Thai Government Five Year Plan. (2) To create a broad-based functioning delivery system for family planning information and services, including the active participation of the Ministry of Public Health, the Bureau of Population Planning, the community-based distribution program, tambon doctors, and traditional village midwives.

Its general thrust is to keep the momentum going in Thailand's National Family Planning Program by supplying the assistance necessary to expand family planning services into rural areas. The principal focus is on making voluntary sterilization services available at a cost and at a place where the rural poor can afford to use them.

A. Beneficiaries The beneficiary group is not specifically identified, but it is assumed to be those desiring fewer children. Other beneficiaries would be family planning specialists.

B. Schedule The life of the project is FY 1976 to FY 1981. Implementation of the project is approximately at midpoint.

3. Assessment

The Population Planning Program in Thailand is generally adjudged to be one of the most successful in the third world (the 1970 growth rate of + 3.0 percent was reduced to 2.1 percent by 1978), and all of those interviewed expressed the view that AID has contributed significantly to this success.

A. Seen in historical perspective, AID's initial support in 1970 had been catalytic in enabling the Royal Thai Government (RTG) and private sector agencies to launch family planning programs either on a regional or national level. This support began in the late 1960's when a convergence of RTG and private family planning efforts was taking place.

RTG interest in population planning arose in response to a 1957 report by the International Bank for Reconstruction and Development that the 3.2 percent population growth would hinder socioeconomic development of Thailand. This led to the 1964-1966 Family Planning Pilot Project conducted at Potharam (a rural district of 8,000 people in Ratchaburi Province some 75 kilometers south of Bangkok) by the Ministry of Public Health in consultation with the RTG National Research Council and the National Economic and Social Development Board (NESDB). The family planning methods used in this study included oral pills, condoms, intra-uterine devices (IUD's),

and foaming tablets. The overwhelming response of the Potharam population to the program encouraged the Ministry of Public Health to begin a program in 1968 to train personnel in family planning services. One of the prime movers in this effort (as well as in the whole population planning movement in Thailand) was Dr. Alan Rosenfield, a gynecologist and member of the Population Council, who was working in the Ministry of Public Health.

Meanwhile, other agencies were initiating family planning programs. In September 1973, the McCormack Hospital in Chiang Mai organized family planning services in a clinic. Under the direction of Dr. Edwin McDaniels this program expanded as the number of acceptors increased and new contraceptive methods were added (e.g. in 1966, a small oral-pill program was begun within the Christian church of Nan Province). In 1965, Chulalonghorn Hospital started a mobile family planning unit to distribute IUD's and give advice on birth control. News of it spread, resulting in acceptors from every Thai Province and some from Laos. At the same time, contraceptive pills, condoms, and other devices became available commercially. Sales increased steadily; in 1968 1.4 million pill cycles were sold and this figure rose to 3.2 million by 1970.

In 1970, the RTG promulgated its National Population Policy and launched the National Family Planning Program. American support of this program began that same year through the efforts of Bruce Carlson, the Population Officer in the Bangkok AID Mission. The most important AID contribution was the provision of free oral pills, distributed

through the Ministry of Public Health. AID also supported the ministry's training of family planning technicians. Through the Ministry of Public Health and the Family Planning International Assistance organization, AID-financed free oral pills also reached the McCormack Hospital program. Interviewees noted that AID had the wherewithall to finance a more widespread family planning program and deliver such things as oral pills.

B. Since 1970, AID has been attuned to the needs of the program so that its support has continued to be significant. In 1972, paramedical personnel were authorized to dispense oral contraceptives, and AID financed this program. In 1975, AID began to support a program organized by the Ministry of Public Health to train non-physician personnel (nurses and nurse-midwives) to perform IUD insertions. By October 1976, free sterilization and free oral pills were available at all RTG health facilities. The 1970 growth rate of +3.0 percent had been reduced to 2.1 percent by 1978.

C. Evidence. To assess the project, we interviewed vasectomy patients, midwives, doctors, provincial chief medical officers, missionaries, hospital administrators, former AID population experts working in the private sector, government officials, and AID personnel. We visited rural health centers, urban clinics, and urban hospitals (rural people often come to urban facilities for their services).

(1) Growth Rates in Thailand The National Family Planning Program estimates that the population growth rate in Thailand is currently about 2.2%, down from 3.3% in 1970, 2.5% in 1976, and 2.1% in mid-1978. Whether the absolute figures are correct or not is less important than the trend, in our estimation: the drop is very rapid. We were told by nearly everyone we talked to that the Thai people have no religious or emotional hang-ups with respect to family planning. There still remain pockets where growth rates are high, however, primarily in the northeast and south where there has been least modernization, where security is a problem, and where literacy and electrification are lowest. These areas will require much greater effort than in the past on the part of family planners; as one respondent put it, people who work in these areas will have to be combinations of psychologists, sociologists, anthropologists, family planners, and good walkers and/or drivers of four-wheel-drive vehicles.

(2) Two Farmers Receiving Vasectomies Two young farmers were lined up to receive vasectomies (which are done without charge) at a second-class health center in the Muong district of Nakhon Sawan province in central Thailand (this area has proved very receptive to family planning in the past). Both of the men were married. One of them, 33 years old, had four children ranging in age from 2 to 10; he said that he was having the operation because he had "too many children to feed." The other, only 26 years old, had two children aged 3 and 6; he was having the operation because he had "no land to cultivate," i.e. he worked as a farm laborer but owned no land. Both were obviously very poor. Both had signed consent forms, had

the approval of their wives, and understood that there was some pain and that they should not do heavy work for five days.

Interestingly, their wives had been receiving contraceptive injections before, but apparently they decided to make their decisions on family size permanent. One received the information about it from his children, who were told about it by their teacher at school. The assistant village chief (the village had about 1500 residents) told us that the provincial health office periodically sends out teams (which the Ministry of Public Health calls Information, Education, and Communication Teams) to show movies at the local Buddhist temple (wat); these are ordinary commercial films, but are coupled with a brief session on the virtues of family planning. They emphasize that they will also supply transportation to those who want voluntary sterilization but cannot afford it. Some patients reportedly come on their bicycles and do ride them home, but very slowly. At this particular health center, the vasectomies were being performed by paramedics. There was also equipment for doing tubal ligations (mini-laparoscopic method, or "mini-lap") on women in the health center.

(3) A Doctor in a District Health Center - The district health office and first-class health center at Thatako in Nakhon Sawan province has a full-time doctor, four nurses, and a group of midwives, nurses' aides, and sanitarians bringing increasingly popular here, but that interest in intro-uterine devices (IUDs) was dropping off. He mentioned that the mobile vasectomy team supported by the project was having a big impact locally; since the poor could not afford the sterilization procedure before, or even afford the transportation, there was a big response when it went into action. He also said that the ASIN organization, a private group which compensates doctors for sterilization work they do on weekends (which is also assisted under the project), was a major motivator for the physicians themselves. He gets his oral contraceptives free from the Ministry of Public Health, and he knew that AID was helping pay for them. He also reported that AID was an important catalyst in getting the National Family Planning Program started in 1970.

(4) A Midwife - At a second-class health center in Nakhon Sawan province we interviewed a midwife who works daily at the center in conjunction with a sanitarian. She said that she served about 500 acceptor families, with about 200 of them using oral contraceptives. She had been trained in Bangkok to insert IUDs, and also gave injections of the contraceptive depo provera (DMPA) which her patients buy commercially and bring to her. She had inserted about 200 IUDs and had 30 patients on DMPA. In 1971, she reported that she had only 10 acceptors the whole year, but things were much more active now. She

thought that perhaps 250 people in her area had had voluntary sterilizations (not all were from among the households she served), with about 100 vasectomies and 150 tubal ligations among them. The mobile vasectomy team periodically visits this health center, too, to perform operations. She had heard of AID, but did not know anything about it.

- (5) A Provincial Chief Medical Officer - The provincial Chief Medical Officer in Nakhon Sawan told us that family planning is now made a part of medical training at all levels and that it is also being taught in most schools. (This is interesting, because many teachers are opposed to family planning, for obvious reasons.) He said that the pill is very popular in his province, followed by sterilization. IUDs were popular at first, but usage has been dropping off. He also said that sterilizations had become somewhat less popular as injections became more available. He did not think that the country would have any difficulty lowering the population growth rate to 2.1% if the supply of paramedics can be increased enough and if the vehicles (for mobile vasectomy teams and "motivation" teams) can be supplied. He has had no difficulty getting sufficient supplies of oral contraceptives, IUDs, or surgical instruments, however. The government has also supplied him with a wireless radio system so that he can communicate with health centers throughout the province, and with the provincial health office when he is in the field.

(6) The Mc Cormack Hospital Clinic - The Family Planning Clinic affiliated with the McCormack Hospital in Chiang Mai underlined the RTG commitment to family planning. The Ministry of Public Health supplied the clinic's oral contraceptives, and in conjunction with AID, the ministry subsidized its sterilization program.

The American doctor in charge explained that "we have never lacked for supplies." We also were informed that the Ministry of Public Health had trained 200 hill tribe technicians in basic health and family planning to work among their people in northern border regions, and that AID had funded their training. AID was described as a "great enabler," which helped get the government's family planning program "off the ground."

(7) Various Authorities on Family Planning - In Lampang, a private consultant on population and health matters reinforced the image of AID as an innovator and catalyst in the family planning area. He pointed out that the Agency pushed for mobile vasectomy teams when most people felt that men would not be receptive to them; events have certainly proved the mobile team concept correct, and he said that the primary customers of these teams are poor, not middle-income, farmers. He noted that in his northern Thailand province the number of vasectomies jumped from 100 per year to 1000 when the mobile team arrived. He also commented on the success of the Community-Based Family Planning Services, a private organization supported by the

project, which distributes family planning information and commodities through a network of shopkeepers and others in remote areas. A report partially funded by AID notes that in three years (from 1974-77) services were extended to some 12,000 villages (more than one quarter of the country's total) and 200,000 acceptors. Our respondent said that this effort is getting to precisely those people which the government cannot reach at this stage of the game. The demand is always there for family planning services, he felt; the only problem is coming up with innovative ways to supply them.

Another respondent gave AID high marks for coming up with the financial support when family planning was first attracting interest in the late 1960s. He also remarked that the success of family planning in Thailand seemed to stem in part from the good working relationship between the various public and private family planning groups; he thought that perhaps this was because they generally had independent funding, so that they did not see themselves as competitive, but complementary. He also thought that the country was supplied with very good people in the family planning field, both in national and international agencies.

One outside observer also felt that AID had been catalytic in the early years and that it had been innovative in the middle 1970s, but he thought that perhaps both AID and the Ministry of Public Health were beginning to slow down on the innovation front, that things are beginning to crystallize and mature. Of course, he noted, the job of lowering population growth further is getting more and more difficult. This was not a major point with him, however, and as he put it, it was "just a feeling he had."

Project No. 6 -- SMALL SCALE IRRIGATION (HAND PUMPS) -- (Bangladesh)

1. 1976 Loan 338-T-010 of \$14 million to the Government of Bangladesh.
2. Purpose of the Project (AID-388-0019A):

A. Beneficiaries:

(1) The AID provision of foreign exchange will enable the Government of Bangladesh to replenish and increase the supply of raw materials for local manufacture of 240,000 hand pumps and related components which will be available for sale to Bangladeshi farmers. The project is specifically designed to benefit 1.5 million low-income farmers with an average farm size of less than one hectare.

(2) The majority of Bangladesh farms are small, fragmented land holdings that provide only a marginal existence for the rice farmers. Unutilized land is nonexistent, so increases in food production and income must derive from increased yields and increased intensity of cropping.

B. Schedule: The Project Paper was dated April 2, 1976, and it stated that the anticipated completion of the project would be 1978. As of March 1979, however, implementation of this project was still in the planning stage. It had been decided that the implementing agency in the Bangladesh Government would be the Bangladesh Agricultural Development Corporation (BADC). This organization will: (1) import pig iron, coke, and pipe materials; (2) order manufacture of pumpheads and strainers by the foundries; (3) store the materials and finished products; (4) sell pump sets from about five locations (Chittagong, Dacca, Jessore, Natore, and Rangpur are under consideration; (5) maintain financial records; and (6) supervise the consultants. The current schedule calls for the distribution of 240,000 pumps by 1982.

3. Assessment: Since none of the hand pumps in the AID supported project has been manufactured, the only means of assessing the anticipated impact of this project was to examine a similar hand pump project being implemented by UNICEF. As of 1979, UNICEF had distributed 90,000 hand pumps through the Bangladesh Government's Integrated Rural Development Program.

An assessment of the UNICEF hand pump program was done through a series of interviews. Several UNICEF officials in Dacca were interviewed and provided some background information. Currently, two studies of the UNICEF project are in progress. One is being conducted in the field by Michael Howes of the Institute for Development Studies at Sussex University in England. The other is a survey (financed by UNICEF) organized by Professor Mustaphi Ahmed of the Institute of Business Administration, Dacca University. Although neither study is yet completed, both gentlemen were willing to discuss some of their opinions concerning the UNICEF program. Several interviews also were conducted in Tangail District, northwest of Dacca, with farmers, one of whom has been using the hand pump and several of whom were applying for loans to purchase pumps.

On the basis of this research, the proposed hand pump project supported by AID appears to be promising in terms of the stated goals. The interviews of Mr. Howes and Professor Ahmed, however, raise some questions that are very important to consider in the implementation of this program.

A. The Howes and Ahmed Interviews: They both agreed that there was a definite promise that the hand pump program might attain

its goal of improving the lot of the small farmer by increasing production and income. Both made the point that this program must be perceived in the context of socio-economic changes taking place in Bangladesh because certain aspects of the situation could effect the impact of the program.

On the basis of his on-going research, Howes made the following points:

(1) Some Advantages:

(a) Use of the pump will permit a dry-season crop that will increase production and incomes. This will permit many small landowners to retain title of their holdings, where under normal conditions their ever increasing debt would eventually force them to sell their land.

(b) The simple technology of the pump renders it easy to use and to maintain.

(c) The pump is flexible in that it can be moved easily, and it can be employed either for irrigation or for household water.

(d) Use of the pump permits greater crop rotation, thus preserving soil fertility.

(e) The command area of the pump is relatively small, so there is little waste of water.

(2) Questions Concerning the Pump:

(a) Might the introduction of the pumps give larger landowners more power? These landlords could conceivably gain control of pumps in a local area, thus giving them additional leverage over tenants and small landlords.

(b) Is the operation of the hand pumps too demanding physically for most of the rural poor, particularly at a time of the year (the dry season) when food consumption is low?

On the basis of his preparation for a survey on the UNICEF hand pump project, Ahmed made the following observations:

(1) Some Advantages:

(a) In addition to having a simple technology, the hand pumps have been in use in some areas for awhile, so the farmers have some familiarity with them.

(b) The hand pumps can be purchased for a relatively low price, so they will be available to poorer farmers.

(c) Use of the pumps would increase production and also the demand for services. They also may stimulate new enterprises such as rental of the pumps.

(2) Some Disadvantages: The UNICEF project was planned on too grand a scale, causing some internal disorder. There have been storage problems. Pumps intended for one place were sent to another area. Too many costs were incurred by having many agencies involved in the implementation.

(3) Questions Concerning the Project:

(a) Is the use of the hand pump cost effective? Increase in production will entail higher operation costs -- seeds, fertilizer, storage, labor, and perhaps transportation. Increased production may also result in a lowering of prices for the cash crops. Viability of small land holding depends on the intensive use of the land, nature of crops, and the price one receives for the cash crops.

(b) What will be the effect on the existing socio-economic situation in rural Bangladesh? Population pressures are steadily increasing. Poverty is spreading. Increased production and income may affect a poor farmer's desire for upward mobility. (Ahmed expresses the view that the country population has grown more aware of new opportunities, and they have become more politicized since the "liberation.") Might the big landlords gain control of the pumps (as they gained control of fertilizer in some areas)? Should they decide to do so, they are the most influential members of the farmers' cooperatives (through which farmers obtain the pumps). They might be prompted to do so if fuel prices continue to increase and if their land holdings are dispersed.

(c) What might the ecological effect (particularly on the water table) be with the addition of hundreds of thousands of hand pumps?

B. Interviews with Farmers:

(1) Interviews with two young farmers applying for loans with which to purchase UNICEF sponsored hand pumps:

(a) Both farmers desired to own hand pumps because they had seen them being operated by friends and neighbors with good results.

(b) They plan to use the pumps to cultivate dry-season crops of vegetables (beans and potatoes), bora rice (a dry-season variety of rice that is grown between December and April) wheat, and jute.

(c) They planned to use family labor to operate the pump, but they would hire additional labor to help with the planting of the dry-season crops.

(d) For the fields that these farmers rent (share-cropping); they noted that the increased income for the Landlord (who gets 50 percent of the crop) would make their tenancy more secure.

(2) Interview with a farmer who owns a hand pump:

(a) Cost of the pump is reasonable -- he supplements his income by operating a "baby taxi" (a motorized three-wheel vehicle) between his village and Tangail (a distance of four miles) and also by raising pigeons and sheep. The pump is easy to maintain and it can be used for household needs and for irrigation.

(b) He hired labor to operate the pump (paying 10 Taka -- there are approximately 15 Taka to the U.S. dollar -- to farm a new dry-season crop of jute and vegetables (beans and potatoes for home consumption). Last year his dry-season jute cash crop was sold for 300-400 Taka. He has therefore increased production and profits. The pump also has increased the demand for services.

C. Interview with Foundry Manager in Dacca:

One of the largest foundries in Dacca is producing hand pumps for the UNICEF sponsored program. All of the work is done by hand. Unskilled laborers carry the pig iron to the smelting ovens in baskets on their heads. The work of processing the molded pump parts is done by skilled workers of labor -- 48 hours a week for pay scales ranging from 800-1,000 Taka per month. The current

order from the UNICEF program is 8,600 pumps, and the foundry can produce a maximum of 5,000 pumps per month. If an order is received as a result of the AID sponsored program, the manager will not increase the work force unless a larger number of pumps per month is specified.