

Countries 76 and 77 CPs.

PART I - SUMMARY AND RECOMMENDATIONS

10 m. each. 4920263 (3)
 PD-ADD-539-A1

AGENCY FOR INTERNATIONAL DEVELOPMENT
A. PROJECT PAPER FACESHEET
 TO BE COMPLETED BY ORIGINATING OFFICE

1. TRANSACTION CODE ("X" appropriate box)
 Original Change
 Add Delete

PP
 DOCUMENT CODE 3 259p

2. COUNTRY/ENTITY
 Republic of the Philippines

3. DOCUMENT REVISION NUMBER

4. PROJECT NUMBER

5. BUREAU
 a. Symbol ASIA b. Code

6. ESTIMATED FY OF PROJECT COMPLETION
 FY | 8 | 0 |

7. PROJECT TITLE - SHORT (stay within brackets)
 Provincial Water II

8. ESTIMATED FY OF AUTHORIZATION/OBLIGATION
 a. INITIAL mo. yr. | 6 | 76 | b. FINAL FY | 7 | 7 |

9. ESTIMATED TOTAL COST (\$000 or equivalent, \$1 = P 7.5)

| a. FUNDING SOURCE | FIRST YEAR FY 76 | | | ALL YEARS | | |
|------------------------|------------------|--------|----------|-----------|--------|----------|
| | d. FX | c. L/C | d. Total | e. FX | f. L/C | g. Total |
| AID APPROPRIATED TOTAL | 10,000 | | 10,000 | 20,000 | | 20,000 |
| (Grant) | | | | | | |
| (Loan) | (10,000) | | (10,000) | (20,000) | | (20,000) |
| Other 1. | | | | | | |
| U.S. 2. | | | | | | |
| HOST GOVERNMENT | | 4,000 | 4,000 | | 20,000 | 20,000 |
| OTHER DONOR(S) | | | | | | |
| TOTALS | | | | | | |

10. ESTIMATED COSTS/AID APPROPRIATED FUNDS (\$000)

| a. Appropriation (Alpha Code) | b. Primary Purpose Code | c. Primary Tech. Code | FY 76 | | FY 77 | | FY | | ALL YEARS | |
|-------------------------------|-------------------------|-----------------------|----------|---------|----------|---------|----------|---------|-----------|---------|
| | | | d. Grant | e. Loan | f. Grant | g. Loan | h. Grant | i. Loan | j. Grant | k. Loan |
| PH | | | | 10,000 | | 10,000 | | | | 20,000 |
| TOTALS | | | | | | | | | | |

11. ESTIMATED EXPENDITURES

12. PROJECT PURPOSE(S) (stay within brackets) Check if different from PID/PRP

#1. Continue in the institutional development of LWUA and local water districts.

#2. Assist construction/improvements of selected small waterworks system under a high impact program.

13. WERE CHANGES MADE IN BLOCKS 12, 13, 14, or 15 OF THE PID FACESHEET? IF YES, ATTACH CHANGED PID FACESHEET.

Yes No

14. ORIGINATING OFFICE CLEARANCE

Signature: Richard M. Dangler *[Signature]*

Title: Asst. Director for Capital Development

Date Signed: mo. | 0 | 3 | day | 2 | 5 | yr. | 1 | 7 | 6 |

15. Date Received in AID/W, or For AID/W Documents, Date of Distribution

mo. | | day | | yr. | |

AID 1330-4 (7-76)

Break out local currency.

PROVINCIAL WATER II

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*Reduce number of annexes
so as to come within 100
page limitation, e.g.
N & T which are entirely
unnecessary.*

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B. Recommendations: It is recommended that a loan be authorized to the Government of the Republic of the Philippines (Borrower) to be relent to the Local Water Utilities Administration (a Government Corporation) for \$20,000,000. The total amount of the authorized loan is to be obligated one-half in FY 1976 and one-half in FY 77 with the following proposed terms and condition:

- Terms:
1. Maturity: forty years including a ten-year grace period.
 2. Interest: two percent per annum during the grace period and three percent per annum thereafter.
 3. Currency: interest and principal repayable in U. S. dollars.

Condition: ^{but not later} The second one-half of the total amount will be obligated in FY 77 only if an updated projected disbursement schedule indicates that the total loan amount of \$20,000,000 will be disbursed within five years from the date of the signing of the original loan agreement.

C. Description of the Project:

This project has four aspects:

1. Design and improvement/construction of 25-35 relatively small waterworks system: Under a feasibility study loan, the Local Water Utilities Administration (LWUA) with the assistance of a U. S. consultant, Camp Dresser & McKee International, Inc. (CDM) has studied 110 relatively small provincial waterworks systems for the purpose of determining what could be done quickly and economically to bring the waterworks systems up to an acceptable standard. The final LWUA/CDM report is the basis for this project. A summary is included in the PP as Annex B.

USAID interprets "rural" to mean anything outside Manila. None of the projects will be in urban centers but will be in provincial areas, as title implies and will reach the poor majority.

As was explained in the FY 76 and FY 77 PRPs, this is the fourth phase of development of a total provincial water program in which AID has had active involvement. AID financed the prefeasibility studies from which the concept of a national institution providing financing, training, standards and regulations to local independent water districts emerged. AID also financed the comprehensive feasibility studies which led to the creation of the recommended institutions. By Loan 492-U-033, AID is currently financing consulting services to the national and local institutions and partially financing the improvement/construction of five relatively large provincial urban waterworks systems. These five subprojects are well into implementation and are in various stages of design and construction. This overall project under Loan 033 is proceeding very well under LWUA, thus influencing USAID's recommendation for continued support to the overall program.

LWUA realizes that the time span from prefeasibility through feasibility, design and construction of a comprehensive waterworks system is extremely long and the cost of total rehabilitation very expensive. They also know that it cannot limit assistance to only total rehabilitation and still meet the national demand. Both large and small communities are forming into independent Water Districts and clamoring for technical and financial assistance. There is no doubt that community waterworks systems in the provinces, almost without exception, are antiquated, uneconomical, serve a small portion of the community and provide unsafe water. The needs and expectations of the provincial urban areas are just too great to follow the traditional route of total one stage project development. As a result, LWUA has developed what is called the "high impact" program, a first stage effort, in which only the major defects of a waterworks system are corrected and the system management assisted to put the system on a sound, businesslike basis.

A LWUA/CDM study identified 81 potentially eligible projects from a total of 110 systems studied. A project is classified as "not potential" where the source of water is uncertain and FAA Section 611 (e) could not be satisfied without

resorting to further investigations. Before implementing a subproject, LWUA, with the assistance of its general consultant, James M. Montgomery, Consulting Engineers Inc. (JMM), will screen the potential projects again, discuss the formation of an independent water district with the city officials, perform the necessary financial/economic analysis and then make a final decision on design and construction. Since these subprojects are all relatively small, LWUA intends to prepare the engineering design internally and will assist the newly formed water district with the contracting and construction process. This loan will finance, in addition to items described in paragraphs 2, 3 and 4 below, the foreign exchange requirements of that portion of the local currency costs which would bring AID participation up to 50% of each subproject estimate. Special Letters of Credit (SLC) will be used to reimburse local currency costs using a modified Fixed Amount Reimbursement procedure. (This same financing arrangement is currently being followed under AID Loan 492-U-033 for the financing of JMM services to LWUA and the construction of five relatively large systems.)

At the end of this 5-year project, 25-35 of these "high impact" subprojects will have been completed.

2. Consulting Services: AID is currently financing the services of JMM from Loan 492-U-033. In addition to providing general engineering services, JMM is providing management assistance for both the national and local institutional development. AID provided a \$400,000 grant in 1974 to partially finance initial JMM services towards institutional development, but now that the program is well underway, loan funds will be used to finance these services in the future. Under the original JMM/LWUA contract, JMM was responsible for providing general advisory services to LWUA and the first five subprojects. It soon became apparent that this scope was inadequate because, as interest was generated, about 30 water districts were formed and many more are in the process of formation. Also, LWUA with ADB financing has commenced design/construction of five more relatively large waterworks systems. Therefore, LWUA

requested AID to finance a contract amendment which will provide among other provisions, additional management advisors to assist with the institutional development of all water districts, a financial advisor to LWUA, and more resident engineers to advise in the supervision of construction and to assist with the training of design engineers to carry out to do its own design work under the "high impact" program. The dollar portion of the original consultive services contract is being financed from AID Loan 492-U-033 plus the \$400,000 grant. The recently negotiated amendment will be financed from two sources: about \$.250 million from Feasibility Studies Loan 492-H-030 and the balance of approximately \$2.5 Million from this proposed loan. Since the current contract as amended expires in July 31, 1978 and the "high impact" program will extend beyond that period, it is assumed that some additional consulting services will be needed beyond the current contract period. It is not possible to predict at this time what level of competency LWUA will have reached by July 1978; however, for planning purposes, it is assumed that LWUA will be able to carry on the institutional development work without additional consulting services but will only require some assistance in engineering. Therefore, it is estimated that only \$500,000 will be needed for technical services after July 1978. The \$10 million FY 76 obligation will fully fund the January 1, 1976 amendment for \$2.5 million and the next \$.5 million will come from the FY 77 obligation if needed. Funds not needed for consultant services will be used for project construction. At the end of the five year project period, LWUA should be fully staffed with trained personnel, including 20-25 design engineers, and be capable of carrying out all aspects of this program without foreign technical assistance.

3. Commodities: Since many of the smaller waterworks and certainly all of those in the "high impact" program will be too small to establish and support a fully equipped water quality and analysis laboratory. LWUA intends to set up a central laboratory which will be used for water quality control testing and for training. \$50,000 is being scheduled for this purpose. At the end of the project LWUA will have a fully equipped laboratory staffed with qualified staff sufficient in capacity to handle the needs of LWUA.

Training is a constant on-going activity of LWUA. Presently training sessions conducted by LWUA range from seminars for water district Board members to classes in meter repair. LWUA intends to set up a fully equipped training facility to train waterworks system operators and maintenance personnel. For this purpose, \$50,000 is also programmed to cover the cost of imported audio-visual aids and equipment. At the end of the project LWUA will have a training facility and staff. One of the long term consultants included in the LWUA/JMM contract amendment is a training advisor.

4. Participant Training: Under the current project, AID provided a \$100,000 grant for participant training. This was used to send 25 participants to the U.S. for formal and observation training for periods ranging from two weeks to three months plus one long term participant for training in hydrogeology. This was an extremely successful program and all the participants are currently employed by LWUA or water districts. It is now anticipated that some specialized training in the U.S. will be beneficial in certain fields such as hydrogeology, hydraulics and pumping systems, and waste-water engineering. \$100,000 is being reserved for this purpose.

D. Summary Findings:

Implementation of the "high impact" program will have considerable favorable effect on the overall provincial water program of the Philippines. This is an opportunity to improve a very unhealthy situation which exists in 25-35 communities and thus improve the health and economic development of 1.5 - 2.0 million people in a relatively short time for a relatively small amount of money.

The LWUA/CDM 110 waterworks systems study clearly shows that a need exists and it has identified over 81 cities as ready candidates for the proposed "high impact" program. At the time of preparation of this PP there are several indications that confirm the readiness of the project for implementation. For example: (1) Over the past two and one-half years,

LWUA has developed into a relatively mature and capable organization (See Annex M) with the assistance of JMM, of successfully implementing the project. (2) 12 of the 110 cities studied have already formed water districts and 16 cities are in the process of doing so. (3) JMM and LWUA have negotiated a contract amendment (approved by AID, subject to availability of funds) to provide the consulting services necessary to implement the project. (4) As described in Section C. 1, CDM has completed their study of 110 systems and recommended improvements for over 80 cities. (5) LWUA contracted for the services of a U. S. economist to develop a methodology to test the financial and economic feasibility of the cities under the "high impact" program. Prior to approving the eligibility for construction financing by both AID and LWUA, the economic criteria set forth in Part 3. F must be satisfied. The results of testing the methodology on several of the potential project cities, indicate a very favorable financial and economic return on investment. (See section Part 3-B for Technical Analysis and Annex B for the A/E's detailed summary of the 110 cities project).

AID's statutory requirements will be fully satisfied. CDM, the U. S. engineering firm conducting the initial study on the 110 systems, has identified those cities (81) which are potential projects and the particular defect that must be corrected to bring the system up to an acceptable standard. The study further refines the potential by identifying 16 of the 81 that require some further engineering analysis before the particular defect can be corrected. CDM is also the firm conducting the comprehensive feasibility studies for ten relatively large cities for LWUA. They, therefore, recently have updated cost data and as a result, USAID is confident that the engineering analysis and the cost estimates meet FAA Section 611 requirements. Subsequent engineering prior to construction will be done by LWUA under the guidance of JMM. USAID has complete confidence in JMM, who have demonstrated their capabilities during the past three years of the program beginning with the 1973 comprehensive feasibility studies on which AID Loan 492-U-033 was based.

The financial/economic analysis methodology and testing which will be used for each subproject is given in this PP (See Annex T). A loan Condition Precedent will require that the financial/economic analysis be performed for each subproject prior to a request for loan financing.

An environmental assessment was made by CDM (See Section Part-3-C and Annex C for detailed discussion).

This PP contains the Mission Director's 611 (e) Certification (See Annex G) that the Philippines has the capability to effectively maintain and utilize the project.

E. Project Issues:

The following issues (questions) were raised during the preparation and presentation of the FY 1976 and FY 1977 PRP to AID/W (See Annex A) and are resolved as follows:

1. How does improved potable water system relate/coordinate with other GOP efforts in public health sector? The GOP has a Four-Year Health Plan which, among other items, addresses itself to the following priorities:

- (a) Control of Communicable Diseases
- (b) Improvement of Environmental Health Factors
- (c) Extension of Rural Health Services
- (d) Programs in Development of Medical Services

All of these priorities are related to waterborne or water related diseases and is complimentary to the efforts of the provincial urban water program. See Annex 1 for a more complete discussion of this issue and a summary of some of the GOP and other donor activities.

2. How will the "high impact" program benefit the poor and how will the poor unable to pay for connection be served? Almost by definition, the small towns chosen for this project are at the lower economic level. In relation to each other some

are poorer than others, but all are poor. Partially to obtain an answer to this question, CDM contracted with the Institute of Philippine Culture (IPC) to make a socio-economic profile of six sample cities as a supplement to the CDM's 110 system study. Copies of the IPC study are available from ASIA/CCD for anyone wishing to review their findings. (Also, see Section, Part 4-C for details on the evaluation program, and Section, Part 3-E.)

The project target areas are the small provincial-urban communities with AID participation justified upon the assumption that improved waterworks will improve the quality of life through health and an increase in usable income.

It is LWUA's policy that water be made available to all within the service area but it is also LWUA's policy that all water be paid for. The projects will be beneficial to the poor in two ways through a socialized rate structure and by the use of public faucets. (See LWUA's published policy, Annex L). LWUA's rate structure recommends a lower rate for the users of the smallest meter (3/8"). For those unable to afford a connection, there will be strategically located public faucets. The public faucets will be metered and the water paid for in bulk by the local government or some other group arrangement. One assumption is that the local governments will consider it their responsibility to provide the people with essential needs. If the local government does not accept the responsibility, then the public faucet will be under the control of the barangay (community) leaders who will be responsible for collecting a charge from the users. LWUA queried six water districts as to how they were handling the payment for water from public faucets. Four responded that the local government is paying for the water and two responded that the barangay leaders are responsible for the faucet and they are collecting a charge from the users. So it appears both methods are being used satisfactorily and we can see no reason to change the procedure.

3. What is the role of other donors and the rationale for continued AID assistance? It was with AID's encouragement and assistance that the program was initiated in 1970.

Only after it was demonstrated that the institutions were in place did other donors offer assistance. LWUA obtained a Danish loan for the improvement of two systems in 1974 and recently received an Asian Development Bank loan for the improvement of five systems in the amount of \$16.8 million. The ADB loan is financing five systems for which AID financed the comprehensive feasibility studies. The World Bank has recently shown interest in the project and is expected to finance the improvement of the next five systems, also studied under AID feasibility loan financing. To date the utilization of AID feasibility loan funds has been money well spent as indicated in this case where international donors have been found without any difficulty to carry on financing of the large systems. No other donors, however, have shown any interest in financing the smaller poorer communities to be addressed by this loan. For this reason the GOP specifically is requesting AID assistance on the "high impact" program. (See GOP Loan Application, Annex H). With successful implementation of the "high impact" program it is expected that other donors will become interested and offer future assistance.

4. What is LWUA's institutional capability to undertake expanded program? LWUA is fully capable of undertaking this "high impact" program but, they believe that technical assistance will be needed for several more years. This issue is discussed in more detail in paragraph 8 below, Annex M and Annex U.

5. How will water districts obtain spares for maintenance? The problem of spare parts is recognized by LWUA and previously by the Consultant preparing the feasibility studies. The bid documents prepared by LWUA and JMM for the five systems under Loan 492-U-033 require that the contractor furnish spares for those items designated as critical (pumps, motors, chlorinators and instruments) or which normally require high maintenance. The systems also are designed with standby equipment. In addition, LWUA is currently developing a procurement section under its Technical Department which will be capable of undertaking emergency

procurement. Under the ADB projects LWUA is required to do the offshore purchasing, rather than requiring the contractor to do it as is the case under the AID projects. Finally, all LWUA's bids also require that suppliers have a local representative and maintain local stock (pumps, motors, chlorinators and instruments.)

6. What is the environmental impact of the project and how will the project encourage women to participate in the development process? An environmental assessment is given in Part 3.C and a detailed Environmental Impact Statement (EIS) is provided as Annex C. The EIS analyzes the probable environmental effects of the project on such things as, soil erosion, noise, aesthetics, increase in wastewater, as well as to look at benefits and alternative solutions.

The Role of Women is discussed in great detail in Annex N. In this Annex, the role of women is reviewed in its broadest terms - that is, vis-a-vis the society as a whole. It cannot be stated that women have a role equal to that of men, but LWUA and the individual water districts realize that more involvement of women is to their advantage. For instance, it is a requirement that at least one board member of a water district be a woman. Also, LWUA is training and employing a large number of women in their operations. As of March 1976, 26% of the LWUA staff were women and this percentage is expected to increase in the future with women assuming more management level positions.

7. How can accuracy in cost estimates be achieved and how will FAR procedures be implemented? Despite the high level of inflation in recent years, LWUA, working with their consultants JMM and CDM, have been able to be very accurate on cost estimates. For example, on the current five pilot projects under Loan 033, bids for three of the five have been evaluated and in all three cases, the successful bidder was quite close to the engineer's estimates. USAID is confident that CDM's cost estimates on the "high impact" program will be reasonably accurate and will properly

consider inflation. The FAR procedures that will be followed on the "high impact" program are identical to those developed for the five pilot projects under Loan 033. The details and procedures are stated in Implementation Letter No. 5 to AID Loan 492-U-033 (available in ASIA/CCD). The procedures make allowances for the possibility of higher price increases by evaluating cost and agreeing to a fixed amount to be reimbursed only after bids have been evaluated.

8. Regarding the new element, the "high impact" program: Will municipalities to be included in "high impact" program have autonomous water districts? How will the "high impact" program affect the development of complete systems? What will be the program's effect on LWUA and consultant staffing? How will it accelerate benefits to the poor majority?

All systems under the "high impact" program must be independent water districts. Presidential Decree 198 requires that water districts be formed and certified as a prerequisite to receiving financial assistance from LWUA. As mentioned above, LWUA is currently discussing water district formation with potential "high impact" project areas and as of this date, 12 have already formed water districts and 16 are in the process. This already is more than can be improved within the first two years of the project.

The "high impact" program will bring about complete system development. In addition to the Phase I physical system improvements, the water district will receive technical and managerial assistance from LWUA and JMM. For example, the water districts will be required to install the LWUA commercial practices. The commercial practices include policies and procedures for staffing, billing, accounting, personnel, etc. and were developed by a Philippine management consulting firm under a subcontract to JMM under the current loan project 033. These practices have already been installed in the five pilot projects and are proving very successful in cutting costs, raising revenues and putting the systems on a

more businesslike basis. All five systems have raised collections by a very high percent. Three of the five have already accumulated sufficient surplus to make their scheduled repayments to LWUA. By putting the small systems on a businesslike basis they should be able to self-finance some of the subsequent improvements.

The "high impact" program clearly will require additional staff for both LWUA and JMM. This is already being accommodated. LWUA is currently staffing up and as mentioned previously, LWUA/JMM amended their contract January 1, 1976 to increase the total man/months of consulting services from 325.75 to 669.75. They have more than doubled the current contract to accommodate the additional program. The additional man/months are primarily for management advisors (to the many new water districts) design engineers, training and financial advisors. JMM is prepared to increase its staff to coincide with implementation of this proposed loan.

The "high impact" project will accelerate the benefits to the poor majority. As stated in other parts of this PP, these relatively small communities are less developed than the 15 larger cities currently being assisted or proposed for assistance from Loan 033, ADB and IBRD. Without the "high impact" program the smaller communities would have to wait until the large cities are assisted before funds could be channeled to them. This program immediately targets on the poor. See Section, Part 3. E.

9. What is the evaluation of institutional development on the local level? During the initial three years of LWUA operations, 30 water districts have been formed. Some of these districts have made considerable progress while others have virtually stood still. A discussion of the water districts institutional capability to handle financial management, personnel management and physical resource management, is summarized in Annex U.

10. What is the status of the evaluation of health and economic development impact for the project under AID Loan 492-U-033?

A condition precedent to Loan 033 required an evaluation plan to assess the health and economic development impact of the project. AID/W agreed to assist LWUA develop an acceptable evaluation plan. AID/W sent a team to Manila in October 1974 to investigate the problem and develop a scope of work. Seven months later in April 1975 the team submitted a report which, while not developing a scope of work, did provide a starting point in plan development. In April 1975 AID/Washington executed a PASA agreement with the U. S. Bureau of Census to furnish a Survey Statistician to further assist LWUA and USAID. The Survey Statistician arrived in Manila in September 1975, and has made several subsequent trips since. During these TDY trips the statisticians worked with LWUA which contracted with the Institute of Philippine Culture, Ateneo de Manila University (IPC). The LWUA/IPC contract was signed late January, 1976 with completion of Phase I in early May, 1976. The contract is funded by an AID grant of \$25,000. A copy of the IPC Scope of Work is attached as Annex M. The study will be conducted in four phases.

LWUA/IPC Contract Schedule

| | |
|-----------|---|
| Phase I | Preparation of the Research Design - 4 months |
| Phase II | Baseline Survey - 8 months |
| Phase III | Interim Monitoring - late 1977 |
| Phase IV | Follow-up Evaluation - late 1979 |

IPC is a highly qualified and motivated organization which has considerable experience in the research field of social science. USAID and LWUA are confident of obtaining a useful research document. The PASA agreement with the Bureau of Census

provides for periodic return visits of the Survey Statistician to Manila to review the work and progress of IPC. The findings and conclusions of the IPC evaluation study will equally apply to the systems improved under the "high impact" program.

11. Who are the beneficiaries in the first five cities, Loan 492-U-033? A detailed socio-economic profile has been completed for all five cities and is available with ASIA/CCD. Annex P gives the findings on one of these cities, as an example, with discussions on the city economy, income distribution, education, health, government, religion, recreation and ends with a statement of the compatibility of the project with the sociocultural environment.

12. Social Analysis of "high impact" service area? The most detailed social analysis of the "high impact" target area available at this time is the IPC "Socioeconomic Profile of Six Selected Towns" prepared for CDM referred to in other parts of this PP. See Part 1. E. paragraph 2 above, Part 3. E and Annex Q. A brief quote from page xiii of the IPC study Executive Summary reads as follows....."..... the income reported for even the most affluent of the six towns is in absolute terms, low indeed. This is especially true if one considers the equivalent dollar values involved, an assessment which would rate all the six towns as poor."

13. What procurement procedure will be followed under the "high impact" program? To the extent possible LWUA will follow the procedures currently being used in the five cities (Loan 033) wherein the construction contractor's bid includes the material and equipment needed for the project. The contractor makes all arrangements for purchase and delivery to site (except that AID establishes the Letter of Commitment and LWUA establishes the Letter of Credit). If this procedure is found to be not practical in some cases because the project and the local contractor are relatively small or inexperienced, then LWUA's newly established procurement section will make the purchase and furnish the

materials and equipment to the contractor. See paragraph 5 above and Implementation Plan - Part 4. B for more details.

14. Is there additive funding needed for feasibility studies? USAID expects the GOP/LWUA will request some additional funding for feasibility studies from AID Loan 492-T-040, Consulting Services III. It is not their intention to utilize funds from this proposed loan for that purpose. The GOP either has financing or prospects for financing most for all the cities covered by previous feasibility studies and they believe that they can obtain financing for all projects for which feasibility studies are available. They expect follow-on loans for comprehensive improvement/construction of waterworks systems from ADB as well as IBRD. As stated elsewhere, no other donors have expressed interest in financing feasibility studies although they have expressed interest in financing capital improvements. Finally, the financial requirements of the "high impact" program even at this initial stage far exceed this proposed \$20 million loan; and therefore, the GOP/LWUA does not wish to use any of the limited proceeds from the proposed loan for feasibility studies. USAID supports the GOP/LWUA position.

15. Impact on human rights? This project will have a positive impact on the human rights of the persons affected by the project. The Board of Directors of the local water districts is composed of five representative citizens of the area; one representative of civic oriented service clubs, one member a representative of professional associations, one member a representative of business, commercial or financial institutions, one member a representative of educational institutions and one member a representative of women's organization. With this representation on the Board, the communities needs, aspirations and rights are fully considered. This is a representation and development of human rights that did not previously exist. Finally, an improved water supply will lead to increased personal and community cleanliness, a perceived improvement in quality of life and increased individual dignity and well being.

No additional issues were raised.

PART 2 - PROJECT BACKGROUND AND DETAILED
DESCRIPTION

A. BACKGROUND

As stated in the Philippine Mission DAP "... the most critical areas of Philippine development requiring external assistance ... are the same areas which are the focus of current U. S. legislative authority for A. I. D. - population and health, food and nutrition and rural development." This project emerges out of a recognized national public health problem. The inadequate water systems in the urban provincial areas have contributed to a public health hazard resulting in a high prevalence of water related diseases in the Philippines. To quote from the project PRP "The Philippines has one of the highest morbidity and death rates for water related diseases in all of Asia for which there are statistics. Gastroenteritis is the fourth leading cause of death in the Philippines excluding accidents and infant mortality. This extremely high incidence of intestinal disease is a major concern of the Government of the Philippines (GOP), and we believe that the poor quality and quantity of water in provincial urban areas is probably the major contributing factor. The GOP, therefore, has stated that a local water development program aimed at improving the health and welfare of the people in the provincial urban areas by providing safe potable water is one of their highest priorities."

"While the precise impact of improved water supply on health and nutrition is still unknown, it is known that the ready availability of potable water results in improved health for the beneficiaries. Recorded statistics show that the incident of water related disease is greater in the Philippines than in most other Asian countries. United Nations Health statistics indicate that in 1970 the mortality rate for water related disease in the Philippines was 38.6 per 100,000 population as compared to 0.8 for Hong Kong, 8.0 for Singapore and 19.3 for Thailand."

In an attempt to develop a viable solution to this problem, the GOP in May 1969 requested USAID financial assistance to undertake feasibility studies on waterworks in provincial areas. A prefeasibility study was made by a team from the U. S. Department of Health, Education and Welfare under A. I. D. auspices. The conclusions of this study, completed in September, 1970, were considered in the scope of work for the feasibility studies contracted for in May, 1971 by the GOP (financed under A. I. D. Loan 492-H-023). These studies were performed by a U. S. engineering firm and completed in June 1973.

The studies had two aspects. First were recommendations on the organizational and institutional aspects of water supply at both the national and local level, and outlining the needs for technical, managerial, financial, and regulatory assistance to communities wishing to improve and expand their water utility systems. The second aspect was undertaking individual technical and economic feasibility studies on six provincial water supply systems.

Following the recommendation of the studies, the GOP chartered the Local Water Utilities Administration (LWUA) as the national institution and local water districts on the provincial level by Presidential Decree 198, issued May 23, 1973. The Decree specifically states the GOP policy to develop on a high priority basis, economically viable and sound water supply and wastewater disposal systems for the population centers of the Philippines. This policy would be implemented by the formation and operation of independent, locally controlled water districts under the national LWUA. The LWUA would act as a channel for providing financial assistance, enforcing uniform standards, training of personnel and the adoption of sound operating and accounting practices. Once formed, the local water districts are subject to the provision of the Decree and do not come under the jurisdiction of any local authority or other political subdivision. Presidential Decree 198 was amended by Decree No. 768 in August, 1975, by which LWUA became a GOP corporation and the GOP's contribution to the capitalization of LWUA was increased from Pesos 200,000,000

to a minimum of Pesos 500,000,000 to be provided over a ten-year period.

LWUA started operations in September 1973. Now, after only two and one-half years in operation, it has developed into a very effective organization, which has already made a tremendous impact on the country through the development of independent water districts. As of January 31, 1976 LWUA had a staff of 152 employees, of which 108 are professionals holding college degrees. LWUA is organized into four departments (See Organization Chart, Annex P) and is working effectively. Evidence of the effectiveness of LWUA is the fact that 30 water districts have been formed and 30 more are in the process of forming districts. Another indication of the maturity of LWUA is the numerous activities that it is currently handling. Seven waterworks systems are in various stages of design and construction (five financed by AID Loan 492-U-033). Comprehensive Feasibility Studies are being made on ten additional provincial cities (financed by AID Loan 492-U-030), a "high impact" program covering 110 relatively small waterworks systems is being studied to determine what can be done quickly to bring these systems up to an acceptable standard, and design and construction of five of the ten cities under the comprehensive feasibility studies are underway with \$16.8 million financing from the Asian Development Bank. In addition, LWUA recognizes the fact that the key to successful operations in the future is the training of personnel. Extensive training opportunities have been provided ranging from seminars for members of the district Boards to courses in meter repair. Training courses are constantly being augmented and will remain a permanent feature of LWUA's activities.

After its first year of operation, LWUA realized that there was more interest in small provincial cities forming water districts than was initially anticipated. It was also evident to LWUA that the time frame for first indication of interest by a community through preparation of a feasibility study, comprehensive design and construction was just too long to maintain interest in the overall program without LWUA providing some immediate or near term technical and financial

assistance. Therefore, out of a need to maintain credibility and to carry out its responsibilities under the Presidential Decree, LWUA developed the "high impact" program. This program as described in other sections of the PP is unique, not only in that it corrects the obvious defects of a waterworks, but literally forces the waterworks to become self-supporting. To receive assistance from LWUA, the community must form into and be accepted by LWUA as a duly constituted water district. Also the water district must install the LWUA recommended commercial practices, which if followed, should put the system on a profitable basis and therefore enable themselves to self finance subsequent improvements.

B. DETAILED DESCRIPTION

1. Logical Framework (See Logical Framework Matrix, Annex D, for overview).

a. Project Goal

"The consequences of unsafe water are serious. Each year an estimated 500 million people are affected by incapacitating waterborne or water-associated illness throughout the world, and as many as ten million people - about half of them infants - die".* AID financed prefeasibility and comprehensive feasibility studies on over 125 provincial urban communities indicate that, almost without exception, community waterworks systems in the Philippines are inadequate and unsafe. By improving a relatively large number of community waterworks systems, which is the purpose of this project, a significant contribution will be made towards improving the public health in the provincial areas, which is the program goal of this project. Obviously the project will make a favorable impact upon public health. But, just as obvious improving the water

*McJunkin, Frederick E. "Community Water Supplies in Developing Countries", p. 2, University of North Carolina, Chapel Hill, North Carolina, 1969.

system alone and providing safe water to more people is not the total solution to the public health problem. Certainly, education, nutrition and other factors have a bearing. As stated in other parts of this PP the GOP and AID are attempting to learn just what contribution improved water supply will make through a very detailed evaluation study. (See Part 1. E. 10 above and Annex O).

While it has been universally recognized that an improved water system will have a favorable impact on public health, it has been equally evident that the improved water system is an essential part of community economic development. In addition to the potential increase in productivity as a result of less illness and longer life, the improved water system facilitates commercial and industrial development. Without the expanded water system, new commercial and industrial establishments would be forced to develop their own individual water supplies. Thus future economic development of a community would be enhanced by the construction of a water system that can meet the water requirements of the industry both with regard to quality and quantity.

b. Project Purpose

The project purpose includes three distinct, inter-related components that collectively contribute towards achievement of the project goal: (1) Increase the use of safe, reliable and economic supply of water in the targeted areas - with particular reference to the lower income group. (2) Institutional development of LWUA and local water districts, (3) Contribute to the economic development in targeted areas. Of the 110 cities studied under the "high impact" program, an average of 25% of the population in each community were being served by the existing waterworks systems. The improvements being recommended are designed to make the water available to the total population in the service area by 1983. This brings the benefits to the total population in a very short period of time. This is possible on these relatively small projects under the "high impact" program because the total quantities of water for each system are not large. Under the current five relatively

large pilot projects (Loan 033) this will not be possible until well after the year 2000. (See Part 1. E. 2 above regarding how this project will reach the lower income group.) At the end of this project, by 1981, these systems will be servicing about 1.5 million people with safe water in the target areas and while the exact effect of the project on public health is not known, an estimated drop of 20% in the incident of waterborne diseases is anticipated.

The institutional capabilities of LWUA and the water districts is the key to continued development and progress of the total program. For this reason, AID is encouraging the use of and financing a rather large component of U. S. consultancy services to LWUA for the life of the project. The tendency in most developing countries is to release the consulting assistance too soon; however, even now LWUA recognizes the value of consultative services. Prior to the expiration of the LWUA/JMM current contract, July 1978, AID and LWUA will carefully assess the needs of the consultant through the remaining life of the project, July 1978. Right now the local institutions depend heavily on LWUA for their individual development with LWUA providing policy and technical assistance. At the end of this project LWUA should be able to carry on all of its functions and continue expansion of the program without assistance of U. S. consultants.

Further, the improved and expanded water systems are expected to provide one of the essential elements for commercial and industrial development. A current common characteristic of the communities studied under the "high impact" program is the lack of industrial establishments. One of the purposes of this project is to facilitate in a relatively short time the type of industries that require a large quantity of good quality water, such as food processing, ice plants, and bottling companies. It is expected that these development opportunities will occur in some communities prior to the end of the project.

Project Outputs

The project outputs are (1) The improvement/ construction of waterworks systems, (2) Trained LWUA personnel, (3) Water Analysis laboratory and (4) Waterworks training laboratory. As stated throughout this PP, the project will result in the improvement/construction of 25-35 relatively small waterworks systems. We already know from the CDM "110 city study" that the total needs from which the 25-35 will be drawn, far exceeds the current capabilities of LWUA to implement and also requires funding far in excess of what is currently available. However, the last three outputs stated above are the guarantee that with additional funding, the program will continue to expand to other communities. The LWUA/JMM contract recently amended indicates the importance placed upon training of LWUA personnel by JMM and the last two stated outputs are essentially training aids. These training aids are essential to the program's success because they have a direct bearing on the effectiveness of LWUA's personnel.

d. Project Inputs

AID's input is a \$20 million loan to be obligated one-half in FY 1976 and one-half in FY 1977. Approximately \$3 million will be used to finance U. S. consultants services. If the total amount of \$3 million is not required for this purpose, the remaining portion will be used for the improvement/construction of additional waterworks systems. \$100,000 will be used for commodities in the water analysis and waterworks training laboratories and \$100,000 for specialized participant training. The balance of the \$20 million, i. e. \$16.8 million, will be used to finance the foreign exchange requirements of the subprojects and partially reimburse the GOP for local currency costs of the subprojects. Local currency reimbursements will be made through a Special Letter of Credit. AID's combined FX and L. C. reimbursement will not exceed 50% of total project costs.

The GOP will contribute a minimum of 50% of total project cost.

PART 3 - PROJECT ANALYSIS

A. Subproject Selection Criteria and Classification

As briefly stated in Part 1 of this PP, CDM with the assistance of LWUA personnel have for the past nine months surveyed 110 relatively small provincial communities (average population of 33,000). The survey included, among other things: (a) an assessment of the communities need for water, (b) an assessment of the existing water system, and (c) a comparison of (a) and (b) and a proposal to make up the deficiency. In addition to the technical study by CDM, LWUA through its consultant contracted with the Institute of Philippine Culture to research a socio-economic profile of the communities under the program. IPC researched six representative areas. Their report is on file with ASIA/CCD. The analysis of one town, Tabaco, is included as an example of a socio-economic profile, as Annex Q. In addition to the socio-economic research study, LWUA also contracted with Andrew Trice, PhD, Economic Consultant to develop and test a methodology for the financial/economic analysis of waterworks systems under the 110 system study, (see Annex T). The CDM report is the basis for this PP. It includes a summary volume plus eight volumes detailing the analysis of the 110 waterworks system. (This too is available in ASIA/CCD.) Excerpts are included in this PP as Annex B.

Of the 110 systems studied, 81 were identified as potential projects. The potential projects were further classified as complete or partial. Sixty-five and sixteen respectively. If a complete project was too costly under the criteria used (see below), it was re-examined to determine if it could be cut back and still fulfill the purpose of bringing the system up to an acceptable standard. If so, it was included but classified as partial.

The study further identified 48 of the 110 requiring additional technical study. Most of the additional study needs relate to groundwater investigation. Twenty of the 48 were among the 61 projects classified as complete and five among the projects classified as partial while 23 are among the projects

classified as not potential projects.

CDM and LWUA early in the study decided that only projects whose construction capital cost equalled about Pesos 200 per capita 1983 population would be acceptable. If all costs (design, interest during construction, land, administrator, etc.) are considered, the cost per capita would increase to Pesos 280/300. This decision of limiting capital costs per capita was based upon the fact that the communities are relatively poor, that LWUA would charge the districts 9% interest for their loan and it is generally accepted in the water development field that people can pay 6%-8% of their income for water - all of which calculates out to roughly P200 per capita capital cost. These assumptions seem reasonable. (For a further analysis of the cost per capita, see the CDM Final Report-Planning Surveys of 110 Water System on file in ASIA/CCD.)

B. TECHNICAL ANALYSIS

The U.S. engineering firm, CDM, that conducted these studies is a highly experienced firm in the field of water-works and wastewater treatment. As stated previously, CDM also is conducting ten comprehensive feasibility studies. As a result they have considerable experience in the Philippines and have an appreciation of the Philippine needs and capabilities. This appreciation was borne out in the firm's constant concern while conducting the five studies (five of the ten) of tailoring their recommendations to the community needs in relation to their ability to pay. This concern was carried through to the 110 systems study as indicated by the selection criteria adopted as described earlier.

By the same token, as a result of their experience in the Philippines, the cost figures and escalation factors are based upon sound judgment and experience.

A summary of the study findings, conclusions and recommendations taken from the CDM final report is included as Annex B of this PP. A detailed description of the types of

deficiencies found in the waterworks studied is also included in this PP as Annex S.

In addition to the engineering study already made on the 110 systems, LWUA will conduct additional studies for each system, as stated below in the implementation plan, before being submitted to AID for financing approval including a financial and economic feasibility analysis. In summary, the report submitted to AID, along with the request for financing, will include the LWUA/JMM technical finding, recommendations, financial and economic feasibility analysis, evidence that the system is under an independent water district as defined by LWUA and certified by the U. S. consultant, JMM.

In conclusion, USAID is satisfied that this project is technically sound and meets the requirements of FAA Section 611 (a) and (b).

C. ENVIRONMENTAL ASSESSMENT

An environmental impact statement of improving/constructing a waterworks system is included as Annex C of this PP. The negative impact on the environment of these individual systems will be something less than that stated in the impact statement because in no case is the total system being improved but only those defects corrected to bring the system up to an acceptable standard. On the other hand the positive impact will be realized because the project will provide acceptable potable water and thus favorably affect the public health and community economic development.

During preparation of the Provincial Water ^I/~~II~~ loan project, the subject of sewage disposal was discussed with the GOP. Sewerage in the Philippines' development plans has not been given the priority it enjoys in more developed countries where per capita consumptive use of water is considerably higher than currently being projected for this project. Only minimal dependence is placed on waterborne sewage disposal at the present time in the Philippines. In

order of priorities, the Philippines considers basic water supply and distribution to be far more important than sewage disposal and at this point in time the GOP is simply unwilling to consider investing an equal amount, and possibly more, of capital funds in sewerage disposal. Cost of sewerage is prohibitive and definitely not within current GOP priority development considerations.

Sewage disposal may become a problem and may precipitate adverse environmental conditions in the future but the establishment of the LWUA and local water districts will create the institutions necessary to effectively address and deal with the sewage disposal problems when appropriate. On balance, the benefits of an expanded, improved, safe, reliable and economical water system would seem, at this time, to clearly outweigh the negative aspects of the absence of a high cost sophisticated sewage disposal system.

D. FINANCIAL PLAN/BUDGET TABLES

1. Construction Costs

Complete Projects (average costs = ₱4,210,000) x 65 = ₱273,635,000

Partial Projects - (average costs = ₱4,956,000) x 16 = ₱ 79,304,000

Weighted Average Costs of one system = ₱ 4,357,000

7.
Average for
total of 65%.

The cost figures stated above are construction cost and do not include cost of land, administration, legal expenses, engineering design and supervision, interest during construction nor contingencies. The consultant estimates that the construction costs should be increased by fifty percent to take into account those factors. Thus based upon engineering studies, the cost stated below are increased by 50% (multiplied by 1.5) and converted to dollars.

2. Total Average Project Cost for One System

Stated in U.S. dollars at 1976 Prices = $\frac{4,357,000 \times 1.5}{7.5} = \$870,000$

*Rate of exchange used is ₱7.5 = \$1.00

3. Escalation Factors

Construction cost curves were developed by the Consultant for in-place costs of pipelines, wells, water treatment plant, pump stations and storage reservoirs. Escalation factors used in the capital cost of recommended improvements are tabulated as follows;

| <u>Year</u> | <u>Escalation Factor</u> |
|-------------|--------------------------|
| 1976 | 1.00 |
| 77 | 1.12 |
| 78 | 1.25 |
| 79 | 1.40 |
| 80 | 1.57 |
| 81 | 1.73 |
| 82 | 1.90 |

Escalated Costs Per System Per Year in U. S. Dollars

| <u>Year</u> | <u>1976 Costs</u> | x | <u>Escalation Factor</u> | = | <u>Total Costs</u> | <u>Loan Cost 1/2*</u> |
|-------------|-------------------|---|--------------------------|---|--------------------|-----------------------|
| 0 | \$ 870,000 | | | | | |
| 1 | 870,000 | x | 1.12 | = | 975,000 | 483,000 |
| 2 | 870,000 | x | 1.25 | = | 1,088,000 | 544,000 |
| 3 | 870,000 | x | 1.40 | = | 1,220,000 | 610,000 |
| 4 | 870,000 | x | 1.57 | = | 1,366,000 | 683,000 |
| 5 | 870,000 | x | 1.73 | = | 1,500,000 | 750,000 |

*The loan will finance 50 percent of the project cost. This 50% is made up of the foreign exchange requirement of the project plus reimbursement, to the GOP by a Special

Letter of Credit in a U. S. Bank, for a portion of the project local currency costs. The project study shows the average foreign exchange requirement of the construction costs to be \$150,000 at 1976 prices. In terms of the same increases and escalation applied in paragraph 2 and 3 above, the foreign exchange requirement (excluding reimbursement) chargeable to the loan for each year would amount to: (1) \$252,000 (2) \$281,250 (3) \$315,000 (4) \$353,250 (5) \$389,250 (\$150,000 x 1.5 x 1.12, etc.)

5. Utilization of Loan

| | |
|--|--|
| Loan Amount = | \$20,000,000 |
| Consulting Services = | 3,000,000 |
| Commodities (lab equipment & training aids) = | 100,000 |
| Participants = | <u>100,000</u> |
| Balance available = | \$16,800,000 for system improvement |

6. Disbursement Schedule (\$000)

| <u>Year</u> | <u>No. of Systems (1)</u> | <u>Cost</u> | <u>Total \$ From Loan (\$000)</u> | <u>Accumulation</u> |
|-------------|-------------------------------|-------------|---|---------------------|
| 0 1976 | | | | 2.700(2) |
| 1 1977 | 5 | 483,000 | 2.415 | 5.115 |
| 2 1978 | 10 | 544,000 | 5.440 .500(3) | 11.055 |
| 3 1979 | 10 | 610,000 | 6.100 | 17.155 |
| 4 1980 | 4 | 683,000 | 2.730 | 19.885 |
| 5 1981 | | | | |

(1) Listed above is a tentative schedule of systems improvements assuming that the systems chosen are representatives

of the group in size. If the system improved are actually smaller than the average, more systems will be improved. However, if the systems improved are larger than the average, less systems will be improved. For planning purposes it is assumed that 25 to 35 systems will be improved.

(2) The disbursement of \$2.5 million that will be put into a Letter of Commitment, soon after the loan conditions precedent are met, to finance the LWUA/JMM contract already executed but not fully funded. In addition the Letter of Commitment for commodities and the PIO/P for participants will also be established within the first year.

(3) \$500,000 for additional technical assistance.

7. Summary Cost Estimate (\$.000)

| | | <u>Project Input</u> | <u>Project Output</u> | <u>Total</u> |
|---------------------|---------------------|----------------------|-----------------------------------|--------------|
| <u>Loan Funded</u> | <u>GOP Funded</u> | | | |
| 16.8 ⁽¹⁾ | 16.8 | | Improve 25-35 water-works systems | 33.600 |
| 3.0 | 3.0 | | Consulting services | 6.000 |
| .1 | .175 | | Laboratory and training facility | .275 |
| .1 | .035 ⁽²⁾ | | Participant Training | <u>.135</u> |
| | | | Total Project Costs = | 40.000 |

(1) Of the \$16.8 million provided from the loan, \$8.7 million will be used to finance foreign exchange requirements and \$8.1 million will be used to reimburse the GOP for partial local currency cost to bring AID's participation up to 50% of the total subproject costs.

(2) International Travel

E. SOCIAL ANALYSIS

Much attention has been focused on whether a given project will have significant impact on poor people. It is evident from a study done by the Institute of Philippine Culture (IPC) that the small cities involved in this project have substantial proportions of their populations in the lower socio-economic categories. Comparing a geographical selection of the proposed project cities to three of the largest and more developed cities in the Philippines, it is evident there is a large socio-economic gap between these two groups as shown by the four indicators used.

Percent of Dwelling Units with the Described Characteristic

| Indicator | <u>Six Project Cities (Geographical Selection)</u> | | | | | | <u>Three Major Cities</u> | | |
|---|--|--------------|-------------|---------------|-------------|-------|---------------------------|--------|----------------|
| | Calba- yog | Calam- ba | Gua- gua | Paga- dian | Taba- co | Vigan | Baguio | Manila | Quezon City |
| Adults with at least Grade Six educational attainment | 24 | 45 | 56 | 28 | 34 | 44 | 76 | 80 | 85 |
| Dwelling units with piped water | 23 | 36 | 24 | 37 | 57 | 32 | 85 | 98 | 95 |
| Dwelling units with electricity | 6 | 50 | 61 | 18 | 17 | 31 | 78 | 95 | 91 |
| Dwelling units constructed of strong materials | 15 | 84 | 72 | 28 | 18 | 55 | 97 | 95 | 96 |

Source: 1970 Census of Population and Housing, Manila

Educational attainment is significantly lower in all project cities than in the major cities. This is also true of availability of in-house water and electricity as well as for the existence of housing made of strong materials. The project cities are much more disadvantaged than the comparison cities on all indicators.

No household income data are presently available for cities in the Philippines. For this reason, using data derived from the IPC study, a measure of the relative status of the people in the project cities with other cities in their same administrative class was made in terms of per capita city revenue. These base data came from the GOP Department of Finance and are based upon the revenues collected by cities. The minimum revenue figures of each administrative class were used, as described in the IPC document, to derive the ratios presented here. These ratios are weighted by population so they can be directly compared. Five cities or municipalities of the same Department of Finance administrative class were randomly chosen for comparison with the respective project cities.

Relation of Project Areas to Their Respective Administrative Class Areas

| Project Area and Each Respective Comparison Area | Per Capital City Revenue (Pesos) | |
|--|----------------------------------|--------|
| | Mean | Median |
| Calamba | 8.43 | 8.43 |
| Five Municipalities | 8.05 | 8.43 |
| Guagua | 8.62 | 8.62 |
| Five Municipalities | 10.78 | 16.67 |
| Vigan | 10.00 | 10.00 |
| Tabaco | 5.00 | 5.00 |
| Five Municipalities | 5.58 | 5.26 |
| Calbayog | 10.64 | 10.64 |
| Pagadian | 17.54 | 17.54 |
| Five Cities | 19.31 | 21.74 |

Source: 1970 Department of Finance, Manila

Note: Since there is only one measure for each project city, the mean and median are identical.

This table shows that generally the project cities have less per capita revenue than do the five cities in each of their respective administrative classes. In only two cases do the means of the project cities exceed those of the comparison cities -- Calamba, where the difference is very small and Vigan, where the high figure is probably due to the large revenue producing, commercial establishments in that city (an additional reason, on a cost benefit basis, to improve the water supply there).

The median is the value above and below which one-half of the observations fall. Given the median per capita revenues for the project areas, it is seen that only one of the project cities (Vigan) exceeds the median value. In most cases, the per capita revenue is not only below the comparison cities, but exceptionally below.

These two measures give an indication of the relative standings of the project cities and municipalities to similar revenue-producing cities and municipalities. It is thus evident that the project areas are significantly poorer than their counterpart cities and municipalities.

The cumulative impact from these statistics is that this project will effect areas of lower socio-economic status in the improvement of water supplies in two ways. Water supplies will reach the poorer people who are in great need of an adequate water supply, and the installations and improvements will take place in cities which have fewer resources for providing these needed improvements to their inhabitants.

F. ECONOMIC ANALYSIS

Introduction

The procedures outlined in the methodology for economic analysis of water projects have been applied to several small communities. Three of these studies have been used to illustrate the end product of the methodology. The cities are

Tuguegarao, Cagayan Province, Malaybalay, Bukidnon, and Gapan, Nueva Ecija. The Tuguegarao service area will include about 64,300 persons in 1983, Malaybalay about 20,000, and Gapan about 33,900.

Benefit-cost, net present value and internal rates of return have been computed on the basis of full and partial inflation. A comparison of the two sets of results may be considered, among other possibilities, as the application of sensitivity analysis to the full inflation calculations to see what would happen if price levels are held constant at the close of the final construction stage. (See Annex T for full explanation of methodology used.)

Benefit-Cost Calculations

With full inflation of all factors, the Tuguegarao project has a benefit-cost ratio of 2.04 to 1.00 and an internal rate of return of 31 percent. With only partial inflation, the benefit-cost ratio is 1.46 to 1.00 and the internal rate of return is reduced to 26 percent. The benefit-cost ratios and internal rates of return, under both approaches, are well above break-even. The project appears to be substantially justified in economic terms. It should be noted that the national interest adjustment, reflecting the general improvement in the community which the project is estimated to cause, is 15 percent. Lump sum costs per capita, with inflation are ₱768.

Questionable, which brings up issue of utility of analysis for health projects, as with those on education.

The Malaybalay project yields a benefit-cost ratio of ₱1.73 to 1.00 and 1.19 to 1.00, respectively, for full and partial inflation. The internal rates of return are 24 percent and 19 percent. This project also exceeds the minimum requirement for economic justification under both calculations. It is considered to have a lesser national interest effect, 10 percent, and to be generally somewhat less justified than the Tuguegarao project, based upon benefits as calculated to this point. Lump sum project costs are ₱425 as compared with ₱768 for Tuguegarao.

The Gapan project yields benefits equal to 3.61 times costs with full inflation and 2.49 times with partial inflation. The internal rates of return are 48 and 36 per cent, respectively. National interest effects of the Gapan project are rated at 10 per cent. Of the three projects presented, the Gapan project, on the basis of benefit-cost analysis alone would be most justified. However cost per capita are higher than in Malaybalay at ₱558 per capita.

Limitations Imposed by the Cost of the Least Costly Means of Creating Identical Benefits

Benefits of a project may not, in national interest calculations, exceed the lesser of the computed benefits or the lump sum costs of the next cheapest method of securing the same benefits. Data as to the costs of alternative projects are more limited in the reconnaissance studies than are data for proposed projects. Of the three projects, only the Gapan study shows the costs of the least costly alternative. Making allowances for possible differences in benefits created, it is estimated alternative costs would be approximately 50 per cent above the computed project cost. Based upon discussions with technical personnel it is estimated an alternative plan at Tuguegarao would also cost 50 per cent more than the proposed project and at Malaybalay it would cost 100 per cent more. More detailed cost estimates are needed before this limitation can be applied except very generally.

Priority Among the Three Projects Based Upon Economic Analysis

The Gapan and Tuguegarao projects both have benefit-cost ratios of 1.50 to 1.00 due to the estimated costs of the cheapest alternative method of supplying the identical benefits. As between Gapan and Tuguegarao, Gapan would be preferred because of the generally more favorable ratio of unlimited benefits to costs and the lower cost per capita of developing the new water supply.

Malaybalay would retain its computed ratios of 1.73 to 1.00 and 1.19 to 1.00, inasmuch as the least costly alternative would cost 2.00 times the proposed project. In addition, the cost per capita of the Malaybalay project is the least among the three communities. The order of priority for the three projects on the bases covered here would be:

1. Malaybalay
2. Gapan
3. Tuguegarao

ECONOMIC FINDINGS, SELECTED WATER PROJECTS
SECURED BY USE OF BENEFIT-COST ANALYSIS PROCEDURES

| Item | Tuguegarao | Malaybalay | Gapan |
|------------------|------------|------------|--------|
| Population, 1983 | 64,300 | 20,000 | 33,900 |

BENEFIT-COST ANALYSIS WITH FULL PRICE INFLATION

| | | | |
|-------------------------|----------|----------|---------|
| Lump Sum Benefits | ₱101.0 M | ₱ 14.7 M | ₱68.3 M |
| Lump Sum Costs | 49.4 | 8.5 | 18.9 |
| Benefits (Costs = 1.00) | 2.04 | 1.73 | 3.61 |
| Net Benefit Value | 51.6 | 4.9 | 49.4 |
| Internal Rate of Return | 31% | 24% | 48% |
| Annual Benefits | 15.4 | 1.3 | 10.4 |
| Annual Costs | 7.5 | .8 | 2.9 |
| Net Interest Adj. | 15% | 10% | 10% |

BENEFIT-COST ANALYSIS WITH PARTIAL PRICE INFLATION

| | | | |
|-------------------------|------|-------|------|
| Lump Sum Benefits | 55.5 | 8.8 M | 36.8 |
| Lump Sum Costs | 38.0 | 7.4 M | 14.8 |
| Benefits (Costs = 1.00) | 1.46 | 1.19 | 2.49 |
| Net Benefit Value | 17.5 | 1.4 | 22.0 |
| Internal Rate of Ratio | 26% | 19% | 36% |
| Annual Benefits | 8.4 | 1.3 | 5.6 |
| Annual Costs | 5.8 | 1.1 | 2.3 |
| Net Interest Adj. | 15% | 10% | 10% |

APPLICATION OF LEAST COSTLY ALTERNATIVE LIMIT

| | | | |
|-------------------|------|------|------|
| Lump Sum Costs | | | |
| Full Inflation | 74.1 | 17.0 | 28.4 |
| Partial Inflation | 57.0 | 14.8 | 22.2 |

ADJUSTED BENEFIT COST RATIO AFTER LIMITATION

| | | | |
|-------------------|------|------|------|
| Benefit/Alt. Cost | | | |
| Full Inflation | 1.50 | 1.73 | 1.50 |
| Partial Inflation | 1.50 | 1.19 | 1.50 |

AVERAGE COST PER CAPITA OF PROJECTS

| | | | |
|----------|------|------|------|
| Lump Sum | ₱768 | ₱425 | ₱558 |
|----------|------|------|------|

G. FINANCIAL ANALYSIS

Introduction

Repayment capacity of the water users in the three study cities has been determined by use of the financial analysis procedures. (See Annex T for full explanation of methodology used). The essence of this ability is found in the first several years when all costs are encountered, including the funding of replacement. Comparisons are made for the 1st, 5th, 10th and 15th year.

Findings by Project

Tuguegarao has relatively high costs per M^3 of water from the 5th year according to the attached table. Costs per M^3 are about 190 centavos for the greater part of the first 15 years. However, repayment ability is estimated at almost 2.50 centavos per M^3 for the same period. Thus, there is a favorable ratio of average payment ability equal to about 130 per cent of the average need.

Malaybalay will have relatively low costs of water, ranging from a high of 82 centavos down to 75 centavos per M^3 . Repayment ability is slightly less than for either Tuguegarao or Gapan, due to a greater share given the household use, but it has substantial relative repayment ability because of low costs per M^3 . The ratio is close to three to one for most of the early years.

Gapan has average costs per M^3 which are slightly less than Tuguegarao but higher than Malaybalay. With repayment capacity also slightly less than Tuguegarao, the net effect is that the two cities have closely similar ratios of ability to pay to cost.

On the basis of the foregoing comparisons the three communities can be rated as follows:

1. Malaybalay
2. Gapan
3. Tuguegarao

This is the same ranking found in the economic analysis. With respect to these three communities, and on the basis of the reconnaissance level data, the economic and financial data provide the same ranking.

It is worth noting that on a cost of project per capita basis there would have been no choice between Malaybalay and Gapan. With the financial analysis Malaybalay is seen to be relatively more able to bear the repayment burden.

FINANCIAL FINDINGS, SELECTED WATER PROJECTS
SECURED BY THE FINANCIAL ANALYSIS PROCEDURES

AVERAGE COSTS OF WATER PER CUBIC METER

| Project Years | Tuguegarao | Malaybalay | Gapan |
|---------------|------------|------------|-------|
| 1 | .63 | .78 | 1.36 |
| 5 | 1.97 | .75 | 1.42 |
| 10 | 1.92 | .80 | 1.71 |
| 15 | 1.92 | .82 | 1.71 |

AVERAGE REPAYMENT ABILITY PER CUBIC METER
OF WATER

| | | | |
|----|------|------|------|
| 1 | 1.35 | 1.19 | 1.38 |
| 5 | 2.41 | 1.90 | 2.02 |
| 10 | 2.48 | 2.38 | 2.30 |
| 15 | 2.48 | 2.38 | 2.30 |

RATIOS OF REPAYMENT ABILITY TO AVERAGE COSTS

| | | | |
|----|------|------|------|
| 1 | 2.14 | 1.53 | 1.01 |
| 5 | 1.22 | 2.53 | 1.42 |
| 10 | 1.29 | 2.98 | 1.35 |
| 15 | 1.29 | 2.90 | 1.35 |

PROJECT COSTS PER CAPITA

| | | | |
|------------------|-------------|-------------|-------------|
| Costs, 1977 | ₱21.2 mil | ₱4.6 mil | ₱7.8 mil |
| Population, 1983 | 64,300 | 20,000 | 33,900 |
| Per Capita | <u>₱350</u> | <u>₱230</u> | <u>₱230</u> |

see p. 24 where criteria is approx. 200 pesos. May be able to stretch to 250, but how about 350?

PART 4 - IMPLEMENTATION PLANNING

A. LWUA and AID's Administrative Arrangements

1. LWUA

LWUA will be the implementing agency of the GOP for this project. Since this is an on-going project, and LWUA has two and one-half years experience, it should present no major problems. See Annex M for an evaluation of LWUA and Annex R for the organization chart. Two aspects of this project will be new to LWUA. They must perform the financial/economic feasibility analysis and prepare engineering design internally for each subproject. However, as stated previously, LWUA will be assisted in performing these operations. The LWUA/JMM contract has been amended to provide extra consulting services in engineering design and to provide an economist to work with LWUA to develop and test a financial/economic feasibility methodology. In addition, the LWUA/JMM contract provides for a full time JMM financial consultant. To ensure continued successful implementation of the AID financed project by LWUA, AID has encouraged a relatively significant input by U. S. consultants. This practice will continue until LWUA gains sufficient experience to implement its programs without external assistance. LWUA's Board is receptive to this assistance and has agreed to use loan funds for this purpose.

USAID is concerned about the organizational planning of LWUA. The area of concern relates to counterpart personnel to consultants. In an effort to transfer knowledge and experience the JMM, the CDM contracts require that several LWUA personnel be assigned to work full with the consultants. There has been a tendency, because of workloads elsewhere, to assign double duty to some employees in these positions and as a result some positions are not fully covered.

In an attempt to alleviate this situation, AID is including a loan covenant requiring LWUA to specifically assign on a

full time basis all counterpart personnel required by the LWUA/JMM contract, Appendix D. It actually includes twenty positions.

In summary, LWUA has or will have, with the above stated qualification, the managerial and technical capability to successfully implement this project.

2. AID

USAID also has two and one half years of implementing experience on this program. The Assistant Director for Capital Development is responsible to the Mission Director for assuring that this project is correctly implemented. A loan officer has been delegated the responsibility of monitoring the program. USAID receives copies of all correspondence between JMM and LWUA and reviews and approves all contracts involving AID financing. The office monitoring the project has the assistance of engineering and legal officers as necessary. No additional AID staff commitment is needed other than usual administrative support of USAID Staff Officer.

B. IMPLEMENTATION PLAN

Implementation of this project starts prior to execution of the Loan Agreement. The "110 Systems" study will be completed by CDM and LWUA on April 30, 1976. This study forms the basis for the project. Previously, LWUA/JMM/USAID had several meetings to discuss the project, conceptualize its implementation and review staffing requirements. JMM has assured LWUA and USAID that they will be ready to mobilize the additional personnel as soon as authorized by LWUA, presumably in July, 1976.

Another important step in the project implementation process is the formation of water districts by the potential subproject waterworks systems. LWUA presently is discussing with local government officials the formation of independent water districts. Twelve of the 110 have already completed

the process of forming districts and 16 have indicated an interest and are in the process of doing so. It is expected that there will be more subproject candidates available than can be accommodated in the early stages of implementation. The decision on subproject selection will depend upon several factors to be weighed by LWUA; for example initial feasibility/economic feasibility ranking; urgency of the need for improvement; capabilities of the Water District Board to respond, and availability of management and operating staff.

Once the decision has been made for a particular waterworks to become a subproject candidate, LWUA/JMM will study the system and prepare a project report. This project report will contain an in depth analysis of the current situation, recommendation of immediate improvements contemplated and describe future needs, discuss alternative solutions studied, and give financial/economic analysis and estimate of costs. These project reports will be certified by JMM.

The project reports will be submitted to AID for review and approval along with a certification by LWUA that the subproject system has formed a water district under the requirements of LWUA and that the LWUA approved commercial practices are or will be adopted by the district.

After approval of the project report by AID, LWUA under the guidance of JMM will prepare the necessary engineering designs and complete the bid package (IFB).

Following the procedures already established and used by LWUA for the five pilot projects under the current Loan 033, LWUA and the water districts will advertise the job locally prequalify construction contractors and issue the IFB, evaluate bids and recommend award. Also following established procedures, LWUA along with a certification and recommendation by JMM, will submit the bid evaluation and award recommendations to AID for review and approval.

Note: Depending on the size of the construction project, the IFB will or will not include the required foreign exchange

materials and equipment. If the project is large enough to attract contractors who have the experience and capability to solicit quotations and import the foreign exchange items, they will be included as is done now on the five pilot projects. If the project is too small to attract the contractor experienced in offshore procurement, the material and equipment to be imported will be procured by LWUA, following AID procurement procedures and material purchased will be furnished to the contractor.

After the contract has been awarded, LWUA will execute its standard loan agreement with the water district, request AID to open a Letter of Commitment for the foreign exchange portion of the contract (or for the amount needed to finance the material and equipment being purchased by LWUA).

The procedures for partial reimbursement to the GOP for the project local currency costs and establishment of the Special Letter of Credit will also be the same as currently followed on the five pilot projects under Loan 033. (See Implementation Letter #5 to AID Loan 492-U-033 on file in ASIA/CCD).

Annex E is a Project Performance Tracking (PPT) System network which will be used as one means to monitor the project. As stated in Section IV-A above, USAID monitors this program on a daily basis. As was done on the five pilot projects under this program, USAID/LWUA/JMM will hold meetings as necessary to review problems and progress. USAID/LWUA/JMM have established a very close relationship on this program and no serious problems are anticipated.

In addition to the daily monitoring of project implementation by the project manager, the USAID/Controller will maintain accounting records to support periodic reporting of planned time phased expenditures compared to actual accrued (applied cost basis) expenditures to USAID management. (This requirement is dependent upon the outcome of tests of these procedures now being conducted.)

C. EVALUATION ARRANGEMENT

Since evaluation of the program is an ongoing activity to the five pilot projects being financed under Loan 033 and LWUA with the assistance of IPC has initiated a detailed evaluation plan on the five pilot projects, we consider the ongoing evaluation study applies to this project and the findings related to health benefits and economic development will equally apply (See Annex O). Therefore, no separate evaluation of health benefits and economic development will be made on this phase of the program. However, a covenant to the loan will require LWUA to make an operational evaluation of the system improvement and installed equipment financed by the loan. For practical purposes this operational evaluation will be made in the second year after completion of a subproject.

D. CONDITIONS PRECEDENT AND COVENANTS

1. Conditions Precedent (CP's)

In addition to the standard CP's; regarding the opinion of the Secretary of Justice, statement of names of the Borrower's representatives, AID will require the fulfillment of the following CP prior to disbursement of any loan funds.

(a) A statement from the Borrower providing for the relending of the loan proceeds from the Borrower to LWUA, such relending to be on terms and conditions not less favorable than the terms and conditions of the loan.

2. Subsequent Conditions Precedent to Opening Additional Letters of Commitment for Procurement of Materials or Reimbursement for Construction of each Water-work System to be Financed:

Submission to AID approval, a subproject report which shall contain: evidence that the subproject waterworks system is an independent water district under the requirements of LWUA, an analysis of the current situation of the waterworks, recommendation of immediate improvements and its future needs, alternative solutions studied, costs data, and a financial/economic feasibility analysis. The project reports will be certified by JMM as to their concurrence with the findings and recommendations.

3. Covenants

In addition to the standard loan agreement covenants, the loan agreement will contain the following:

(a) LWUA covenants within 90 days from the execution of the loan agreement to provide AID with the names of the LWUA personnel assigned full time to the twenty positions designated as counterpart personnel in the LWUA/JMM contract Amendment No. 1, Appendix D.

(b) LWUA covenants to perform a performance evaluation on all subprojects financed by the loan approximately two years after completion of the subproject construction. The performance evaluation will specifically list in detail the improvements made to the system under the project, the current status of those improvements, and recommendations made by LWUA on any deficiencies found.

(c) LWUA covenants to have true accounts and financial statement (balance sheet, statement of income and expenses, and selected statements) of LWUA audited annually, in accordance with sound and consistently applied auditing principles, by independent auditors and shall, promptly after their preparation and in any event not later than six months after the close of the fiscal year to which they relate, furnish to AID (a) Certified copies of such audited financial statements and (b) the report of the auditors related thereto. LWUA shall furnish AID such further information concerning such accounts and financed statements and the audit thereof as AID shall from time to time reasonably request.

Implementation Timetable

1. Loan Authorized by AID/W - May 15, 1976
2. Loan Agreement Negotiated and Signed - June 30, 1976
3. Conditions Precedent to Initial Disbursement Met - Aug. 30, 1976
4. Request for L/Comm for Consulting Services - Aug. 30, 1976
5. L/Comm for Commodities (Laboratory) Established - Nov. 1, 1976
6. PIO/P for Participants Executed - Nov. 1, 1976
7. L/Comm for 1st Waterwork Improvement - March 1, 1977
8. Construction Started on Fifth System - Sept. 30, 1977
9. Construction Completed on First System - Nov. 30, 1977
10. Construction Started on Fifteenth System - Dec. 30, 1978
11. Construction Started on Twenty-Fifth System - Dec. 30, 1979
12. Construction Completed on Last System - Nov. 30, 1980
13. Terminal Date for Requesting L/Comms - July 30, 1980
14. Terminal Disbursement Date - Dec. 30, 1980

DEPARTMENT OF STATE
TELEGRAM

FROM

CLASSIFICATION

UNCLASSIFIED

E.O. 11652: R 192033Z MAR 75
TAGS: FM SECSTATE WASHDC
SUBJECT: TO AMEMBASSY MANILA 4040
BT
ACTION: UNCLAS STATE 62053

AIDAC

E.O. 11652: N/A
TAGS:

SUBJECT: PROPOSED PROVINCIAL WATERWORKS II LOAN

1. EAPAC MET, CONSIDERED AND APPROVED PRP FEBRUARY 13, 1975. SEVERAL ISSUES RAISED WHICH MUST BE FULLY ADDRESSED IN PP. THESE MOSTLY REVOLVE AROUND IMPACT OF PROJECT ON COMMUNITY HEALTH AND ACCRUAL OF BENEFITS TO POOR MAJORITY. FYI. HAVE MET WITH TDY EVALUATION TEAM AND AID/W DEVELOPING SCOPE OF WORK FOR CONTRACTORS' PROPOSALS. MATERIALS GATHERED TO DATE BEING PREPARED FOR POUCHING TO MISSION. EXPECT TO SEND BOTH LATE NEXT WEEK.
2. INASMUCH PROJECT PRIMARILY JUSTIFIED ON BASIS HEALTH BENEFITS ACCRUING FROM IMPROVED WATER SUPPLY, PP MUST, AT MINIMUM MAKE ASSESSMENT TO INCLUDE ONGOING ACTIVITIES OF GOP, OTHER DONOR AGENCIES SUCH AS WHO, UNDP, ETC. AND HOW IMPROVED POTABLE WATER SUPPLIES RELATE/COORDINATE WITH OTHER EFFORTS. THIS RECOGNIZES THAT IMPROVED WATER PER SE MAY NOT BE ONLY OR EVEN MAJOR FACTOR IN IMPROVED COMMUNITY HEALTH STANDARDS; NEVERTHELESS, PP SHOULD PROVIDE SOME DETAIL ON LINKAGE OF PROJECT TO HEALTH PROBLEMS.
3. FOLLOWING ARE OTHER ISSUES RAISED IN REVIEW WHICH SHOULD

UNCLASSIFIED

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BE FULLY ADDRESSED IN PP:

- (A) NEED FULL ANALYSES, BY INCOME LEVELS, OF THOSE BENEFITTING FROM IMPROVED SYSTEMS, WITH PARTICULAR ATTENTION GIVEN TO POORER ELEMENTS OF SOCIETY. IN THIS REGARD, WILL NEED TO QUANTIFY HOW PROPOSED HIGH IMPACT PROGRAM WILL BENEFIT THE POOR.
 - (B) WILL NEED REACH AGREEMENT WITH LOCAL WATER UTILITIES ADMINISTRATION (LWUA) AND WATER DISTRICTS ON HOW THOSE UNABLE AFFORD CONNECTIONS WILL BE SERVED, I. E. PUBLIC STANDPIPES. HOW WILL THEY BE PAID FOR?
 - (C) PP SHOULD CLEARLY SET FORTH ROLE OF OTHER DONORS AND RATIONALE FOR CONTINUED AID ASSISTANCE.
 - (D) NEED FULL ASSESSMENT LWUA INSTITUTIONAL CAPABILITY UNDERTAKE EXPANDED PROGRAM, INCLUDING HIGH IMPACT PROGRAM. DESCRIBE ADDITIONAL CONSULTANCY SERVICES REQUIRED, IF ANY.
 - (E) SOME CONCERN EXPRESSED ON HOW PROCUREMENT BY LOCAL CONTRACTORS OF OFFSHORE ITEMS CAN ASSUME ADEQUATE ACCESS TO SPARE AND REPLACEMENT PARTS IN ORDER EFFICIENTLY MAINTAIN SYSTEMS.
 - (F) PP WILL NEED DESCRIPTIONS OF ENVIRONMENTAL IMPACT AND DISCUSSION ON HOW PROJECT WILL ENCOURAGE WOMEN TO PARTICIPATE IN THE DEVELOPMENT PROCESS.
 - (G) AS EXPERIENCE IN PHILIPPINES HAS SHOWN, NEED MOST ACCURATE ESTIMATES POSSIBLE. FINAL PP SHOULD ALSO HAVE DETAILED DESCRIPTION FOR PROCEDURES CONTEMPLATED.
4. PRP INCLUDED NEW ELEMENT NOT HERETOFORE PART OF PROGRAM, I. E. HIGH IMPACT PROGRAM.
- (A) WILL MUNICIPALITIES TO BE INCLUDED IN HIGH IMPACT PROGRAM HAVE AUTONOMOUS WATER DISTRICTS?
 - (B) HOW WILL THE HIGH IMPACT AFFECT THE DEVELOPMENT OF COMPLETE SYSTEMS?
 - (C) ASSUME MUNICIPALITIES BENEFITTING FROM HIGH IMPACT

PROGRAM WILL HAVE ACCESS TO LWUA TECHNICAL ASSISTANCE AND TRAINING ACTIVITIES. DESCRIBE HOW SUCH ASSISTANCE WILL BE PROVIDED AND EFFECT ON LWUA AND CONSULTANTS' STAFFING REQUIREMENTS.

(D) ALSO SHOW HOW HIGH IMPACT PROGRAM MIGHT ENABLE ACCELERATE BENEFITS TO POOR MAJORITY.

5. MOST OF ABOVE QUESTIONS SHOULD BE REFLECTED IN A REFINED LOG FRAME. INGERSOLL
BT

DEPARTMENT OF STATE
TELEGRAM

INDICATE
 COLLECT
 CHARGE TO

| | |
|------|--------------------------------|
| FROM | CLASSIFICATION UNCLASSIFIED |
|------|--------------------------------|

R 300153Z JAN 76
FM SECSTATE WASHDC
TO AMEMBASSY MANILA 3294
BT
UNCLAS STATE 023279

7

AIDAC

E. O. 11652: N/A

TAGS: ACOM

SUBJECT: PHILIPPINES LOCAL WATER III PRP

REF: STATE 62053

1. APAC MET DECEMBER 29 AND REVIEWED PRP FOR LOCAL WATER III PROPOSED BY USAID FOR DOLS 20.0 MILLION FUNDING IN FY 77. REVIEW ALSO FOCUSED ON UPCOMING PROVINCIAL WATER II LOAN FOR WHICH PRP APPROVED MARCH 19, 1975 IN AMOUNT DOLS 20.0 MILLION (REFTEL).
2. APAC APPROVED LOCAL WATER PROJECT FOR INCLUSION IN FY 77 CONGRESSIONAL PRESENTATION.
3. SINCE BUDGET AVAILABILITIES IN FY 76 ALLOWED FOR INCLUSION ONLY DOLS 10.0 MILLION IN 76 CP AND SINCE BUDGET AVAILABILITIES FOR FY 77 WILL ONLY ALLOW DOLS 10.0 MILLION IN FY 77 CP - APAC RECOMMENDS USAID COMBINE FY 76 AND FY 77 SUBMISSIONS INTO SINGLE PROJECT PAPER FOR DOLS 20.0 MILLION TO BE SUBMITTED AID/W SPRING 1976. PROJECT, IF APPROVED BY DLC, WOULD BE AUTHORIZED IN TRANCHES E. G. DOLS 10.0 MILLION IN FY 76 AND DOLS 10.0 MILLION IN FY 77. (NO POSSIBILITY INCLUSION FOR

UNCLASSIFIED

CLASSIFICATION

SUBJECT PROJECT AS SHELF'S ITEM DOLS 10.0 MILLION FOR FY 77.)

4. COMBINATION 76 AND 77 PROJECTS SUPPORTED ON BASIS INDICATIONS THAT PROGRAM SUPPORT BY OTHER DONORS - E. G. ADB AND IBRD FOR LARGER SECONDARY CITIES, WOULD ALLOW AID OPTION TO FOREGO ADDITIONAL FINANCING FOR SECONDARY CITIES AND PROCEED DIRECTLY TO PROJECT CONCENTRATION ON HIGH IMPACT PROGRAMS IN SMALLER CITIES, WHICH WERE IDENTIFIED AS 50 PERCENT OF PROPOSED USE IN 76 PRP AND SOLE FOCUS FY 77 PRP. PLEASE ADVISE IF THIS CONSISTENT WITH USAID CURRENT THINKING.

5. CONCERN EXPRESSED AT MEETING ON DEGREE OF INFORMATION AVAILABLE RE EVALUATION OF LWUA AND PROVINCIAL WATER I LOAN AND EXTENT TO WHICH PROJECT PAPER SUBMISSION IN SPRING WILL BE ABLE ADDRESS THIS ASPECT AS BASIS FOR FOLLOW ON LOAN. IN THIS CONTEXT NUMBER KEY ASPECTS PROGRAM SINGLED OUT IN DER GENERAL HEADING OF EVALUATION AS POINTS TO BE DISCUSSED IN UPCOMING PROJECT PAPER.

(A) EVALUATION OF CURRENT STATE OF DEVELOPMENT OF LWUA AS INSTITUTION; PROGRESS MADE IN LWUA ORGANIZATION SINCE FIRST LOAN APPROVED - INCLUDING STAFFING, TRAINING, ORGANIZATION AND PROCEDURES, POLICY AND PLANNING RESULTS, PROJECT DEVELOPMENT AND FEASIBILITY STUDY CAPABILITY AND PROJECT IMPLEMENTATION CAPABILITIES - PARTICULARLY IN AREAS OF PROCUREMENT AND CONTRACT MANAGEMENT.

(B) EVALUATION OF PROGRESS SINCE FIRST LOAN RELATING TO DEVELOPMENT OF LOCAL INSTITUTIONAL CAPABILITY AT WATER DISTRICT REPEAT DISTRICT LEVEL - BOTH WITH RESPECT TO CITIES FINANCED UNDER FIRST AID LOAN AND OTHER COMMUNITIES NOW IN LWUA PROGRAM (APPLICANT OR RECIPIENT) NOT AID FUNDED PROBLEMS AND PROGRESS IN ORGANIZING AND STAFFING THESE LOCAL INSTITUTIONS IS PARTICULARLY KEY CONCERN AS IT RELATES TO CAPACITY GO P EXPAND PROGRAM INTO NEW SERVICE AREAS.

(C) GENERAL STATE OF PROGRESS ON EVALUATION RELATED TO IMPACT OF WATER SYSTEMS ON HEALTH IN STUDY AREAS RELATED TO FIRST LOAN SHOULD ALSO BE COVERED. APPRECIATE FACT

THAT LACK OF ACTUAL CONSTRUCTION ON SYSTEMS PRECLUDES HARD DATA ON RELATIONSHIP AT THIS TIME AND THAT DEFINITIVE RESULTS MAY BE SEVERAL MONTHS IN FUTURE. HOWEVER, OUTLINE OF SCOPE, TIMETABLE, RESEARCH INSTITUTIONS INVOLVED, ETC. WOULD BE HELPFUL TO PAPER.

(D) IN CONTEXT FIRST AID LOAN - PARTICULARLY INTERESTED IN SPECIFIC COVERAGE QUESTIONS RELATING TO BENEFICIARIES IN INITIAL FIVE CITIES SERVICE AREAS, E G., HAS ANALYSIS PROGRESSED TO POINT WHERE BETTER PROSPECTIVE FIX CAN BE MADE ON DEGREE AND NATURE OF PARTICIPATION OF LOWER INCOME GROUPS IN IMPROVED WATER SERVICE? PARTICULARLY WOULD APPRECIATE COVERAGE OF HOW PUBLIC HYDRANTS, ALLOCATED WITHIN SERVICE AREA, FINANCED, WHOM THEY WILL SERVE, AND HOW THEY BENEFIT (HEALTH, COST, PROXIMITY, ETC.)

6. FOR PROPOSED NEW INVESTMENTS - PROJECT PAPER SHOULD INCLUDE A DETAILED "SOCIAL ANALYSIS" OF PROSPECTIVE SERVICE AREAS. CLEAR DELINEATION OF PROPOSED DIRECT AND INDIRECT BENEFICIARIES OF SYSTEMS ESSENTIAL; PRP WAS WEAK ON THIS ASPECT AND MUST BE STRENGTHENED IN PP.

7. SINCE HIGH IMPACT SYSTEMS IN SMALLER MUNICIPALITIES LESS LIKELY ALLOW TURN KEY CONSTRUCTION/PROCUREMENT APPROACH AS CURRENTLY BEING UTILIZED 5 CITIES, PROVINCIAL WATER LOAN, PLEASE ADDRESS FULLY IMPLEMENTATION PLAN AS IT RELATES TO PROCUREMENT, WAREHOUSING, CONTRACT VS FORCE ACCOUNT CONSTRUCTION OF SYSTEMS, ETC.

8. AID/W ALSO NOTES EXTENSIVE USE SECOND FEASIBILITY STUDIES LOAN FOR STUDIES AND SERVICES RELATED TO PROVINCIAL LOCAL WATER PROGRAM. TO MAXIMUM EXTENT POSSIBLE, LOCAL WATER PROJECT PAPER SHOULD FULLY ADDRESS AND PROVIDE FUNDING FOR SUPPLEMENTAL TECHNICAL ASSISTANCE NEEDS OF LWUA IN ALL PHASES. IF ANY SUPPLEMENTAL FINANCING IS IN FACT PROPOSED IN THIRD CONSULTING SERVICES LOAN RATHER THAN LOCAL WATER LOAN - PLEASE IDENTIFY AND PROVIDE JUSTIFICATION FOR SEPARATE ADDITIVE FUNDING.

9. ADDITIONALLY, CONSISTENT WITH CONGRESSIONAL CONCERN ABOUT HUMAN RIGHTS, PP SHOULD DISCUSS PROBABLE IMPACT OF PROJECT ON BASIC RIGHTS OF PERSONS POTENTIALLY AFFECTED BY PROJECT.

10. WE ASSUME THAT RELEVANT ISSUES RAISED BY REFTEL
WILL BE FULLY TREATED IN FORTHCOMING PP. KINSSINGER
BT INGERSOLL

**INSTRATION
URVEY
I IIO SYSTEMS**

**TABLE 1
SHEET 1 of 4**

| BASIS FOR PROJECT | | FEASIBLE IMPROVEMENTS | | | | ENGINEERING WORK SPECIAL STUDIES | | | | IMPROVEMENT WORKS WHERE BOTH COL'S 29 & 30 ARE "YES" | | | | | | FOR PARTIAL IMPROVEMENT WHERE COL'S 29 IS "YES", COL 30 IS "NO" | | | | | | | | | |
|--|---------|-----------------------|-------------------------|--|-------------------------|----------------------------------|----------------------------|--------------------------------------|---------------------------------|--|---------|---------|---------|---------|--------------------------------|---|------------------------|---------|---------|---------|---------|--------------------------------|----------|----------------------------|------|
| ADDITIONAL SOURCE APPLICABLE TO TOTAL COST FEASIBILITY | PROJECT | COMPLETE | | PARTIAL | | EMERGENCY | | SPECIAL STUDIES | | METERS OF PIPE | | | | | | METERS OF PIPE | | | | | | | | | |
| | | TOTAL COST P. 1000 | COST PER M/ PERSON 1000 | PARTIAL COST (IF YES IN COL'S 29 & 30) P. 1000 | COST PER M/ PERSON 1000 | IS SUCH WORK NEEDED? | COST FOR SUCH WORK P. 1000 | IS SPECIAL ENGINEERING STUDY NEEDED? | WHAT FIELD? (IF YES IN COL. 27) | COST OF SPECIAL STUDY P. 1000 | 250 mm. | 200 mm. | 150 mm. | 100 mm. | INTERNAL DISTRIBUTION (METERS) | WELLS (M) | ELEVATED STORAGE TANKS | 250 mm. | 200 mm. | 150 mm. | 100 mm. | INTERNAL DISTRIBUTION (METERS) | WELL (M) | ELEVATED STORAGE TANKS (M) | |
| (30) | (31) | (32) | (33) | (34) | (35) | (36) | (37) | (38) | (39) | (40) | (41) | (42) | (43) | (44) | (45) | (46) | (47) | (48) | (49) | (50) | (51) | (52) | (53) | (54) | (55) |
| Yes | No | (5004) | (250) | 4000 | 200 | Yes | 30 | - | - | - | - | - | - | - | - | - | - | 8490 | - | 3800 | 41 | - | - | - | |
| Yes | No | (1746) | (216) | 1586 | 155 | Yes | 10 | No | - | - | - | - | - | - | - | - | - | - | - | 30 | - | - | - | - | |
| Yes | Yes | 1910 | 173 | - | - | - | - | - | - | - | - | - | - | 140 | - | - | - | - | - | - | - | - | - | - | - |
| Yes | No | (12637) | (207) | (12200) | (200) | No | - | Yes | GW ^(b) | 500 | - | - | - | - | - | - | 906 ⁽¹⁾ | 1720 | - | 2290 | 595 | - | - | - | |
| Yes | Yes | (2526) | (135) | - | - | No | - | Yes | GW | 200 | - | - | (2900) | (145) | - | - | - | - | - | - | - | - | - | - | |
| Yes | Yes | 11058 | 147 | - | - | No | - | No | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - | |
| Yes | No | (15200) | (540) | (8700) | (310) | No | - | Yes | GW | 500 | - | - | 10710 | 7100 | 200 | - | - | - | - | - | - | - | - | - | |
| Yes | Yes | 1211 | 156 | - | - | Yes | 327 | No | - | - | - | - | - | - | - | - | (3000) ⁽²⁾ | (2300) | (7550) | (10200) | - | (2) | - | - | |
| Yes | Yes | 978 | 112 | - | - | Yes | 100 | No | - | - | - | - | - | 420 | 54 | 1 | - | - | - | - | - | - | - | - | |
| Yes | No | (2250) | (196) | 965 | 84 | No | - | No | - | - | - | - | - | - | - | - | - | - | 860 | 1190 | 67 | - | - | - | |
| Yes | No | (6650) | (305) | 3400 | 160 | No | - | Yes | GW | 360 | - | - | - | - | - | - | - | - | 4670 | 6695 | - | 2 | - | - | |
| No | No | (5934) | (298) | - | - | No | - | Yes | GW | 500 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Yes | Yes | 657 | 144 | - | - | Yes | 60 | No | - | - | - | - | - | 440 | 39 | - | - | - | - | - | - | - | - | - | |
| No | Yes | (12290) | (191) | - | - | Yes | 90 | Yes | SW ^(c) | 500 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Yes | No | (3690) | (210) | 3220 | 200 | Yes | 99 | Yes | WT ^(d) | 25 | - | - | - | - | - | - | - | - | - | - | 77 | 2 | - | - | |
| Yes | Yes | 3457 | 149 | - | - | No | - | Yes | GW | 50 | - | - | 2990 | 184 | 5 | - | - | - | - | - | - | - | - | - | |
| Yes | Yes | 6602 | 183 | - | - | Yes | 50 | No | - | - | 2600 | 1600 | - | 180 | 281 | - | 1 | - | - | - | - | - | - | - | |
| Yes | Yes | (6604) | (137) | - | - | No | - | Yes | SW | 301 | - | - | (3280) | (160) | - | - | - | - | - | - | - | - | - | - | |
| Yes | Yes | 4132 | 118 | - | - | Yes | 90 | No | - | - | - | - | 5500 | 166 | 4 | - | - | - | - | - | - | - | - | - | |
| Yes | Yes | (8072) | (134) | - | - | Yes | 120 | Yes | GW | 800 | - | - | - | (8200) | (200) | (5) | - | - | - | - | - | - | - | - | |
| No | Yes | (10509) | (184) | - | - | Yes | 1054 | Yes | SW | 1000 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Yes | Yes | 4070 | 120 | - | - | Yes | 370 | No | - | - | - | - | 2000 | 110 | 4 | - | - | - | - | - | - | - | - | - | |
| Yes | Yes | 2516 | 172 | - | - | No | - | No | - | - | - | - | 3900 | 80 | 2 | - | - | - | - | - | - | - | - | - | |
| Yes | Yes | 3686 | 121 | - | - | No | - | Yes | GW | 65 | - | - | 5500 | 80 | 4 | - | - | - | - | - | - | - | - | - | |
| Yes | Yes | 18448 | 149 | - | - | No | - | Yes | GW | 300 | 5980 | 4850 | 2800 | - | 500 | 15 | 2 | - | - | - | - | - | - | - | |
| Yes | Yes | 6397 | 152 | - | - | No | - | Yes | GW | 145 | - | - | 8540 | 5540 | 40 | 4 | - | - | - | - | - | - | - | - | |
| Yes | Yes | 2370 | 112 | - | - | No | - | No | - | - | - | - | 2830 | 4790 | 67 | - | - | - | - | - | - | - | - | - | |
| Yes | No | (8404) | (217) | 7638 | 197 | Yes | 120 | No | - | - | - | - | - | - | - | - | - | 2100 | 8050 | 8550 | - | 4 | - | | |
| Yes | No | (29600) | (327) | 18150 | 200 | Yes | 30 | Yes | GW | 30 | - | - | - | - | - | - | - | 8700 | 7810 | 31075 | - | 17 | 1 | | |
| Yes | Yes | 2927 | 164 | - | - | No | - | Yes | GW | 50 | - | - | 3600 | 119 | 2 | - | - | - | - | - | - | - | - | - | |
| Yes | Yes | 1815 | 108 | - | - | Yes | 2000 ^(e) | Yes | GW | 100 | - | - | 1600 | 61 | 2 | - | - | - | - | - | - | - | - | - | |
| Yes | Yes | 1423 | 80 | - | - | Yes | 28 | No | - | - | - | - | 3300 | 90 | - | - | - | - | - | - | - | - | - | - | |

(b) Groundwater (c) Surface water (d) Water treatment (e) Depends on Groundwater Investigation (1) 350 mm (2) 350 mm

LOCAL WATER UTILITIES ADM
 WATER SYSTEM PLANNING S
 100 CITIES STUDY-DATA SUMMARY FOR

| TOWN | PROVINCE | REGION | DATE VISITED | ECONOMIC NOTES | WATER SYSTEM OPERATION | | | | | SERVICE AREA | | | | | | | WATER SUPPLY | | | | | | | DISTRIBUTION PIPE | | | | | | |
|-------------------|-------------|--------|------------------|----------------|------------------------------|---------------------------|---------------------|---------------------|---------------------|---------------------|-----------------|-----------------|-----------------|---------------------|-----------|---------------------------|---------------------------|-------------|-------------------------------|-----------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | | | | | IS IT PROFITABLE TO OPERATE? | DOES IT COVER 5% OVER 5%? | IS THERE A DEFICIT? | IS THERE A SURPLUS? | IS THERE A DEFICIT? | IS THERE A SURPLUS? | AREA (HECTARES) | POPULATION 1978 | POPULATION 1983 | PERSONS PER HECTARE | | NUMBER OF HOUSEHOLDS 1978 | NUMBER OF HOUSEHOLDS 1983 | CONNECTIONS | % HOUSEHOLDS WITH CONNECTIONS | ON DATE VISITED (CMD) | LITERS/PERSON 1978 | LITERS/PERSON 1983 |
| | | | | | | | | | | | | | | 1978 | 1983 | | | | | | | | | | | | | | | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) | (19) | (20) | (21) | (22) | (23) | (24) | (25) | (26) | (27) | (28) | (29) | (30) | |
| 1. Bangue | Abra | I | 4 Nov. 89 | x | - | - | - | - | 169 | 16,600 | 19,980 | 98 | 118 | 2855 | 950 | 33 | 2000 | 130 | 363 | 2105 | 3900 | 8785 | 0.53 | 9.2 | 4400 | 0.27 | 0.66 | | | |
| 2. Itogon | Benguet | I | 28 Nov. 92 | - | - | - | - | - | 30 | 7,320 | 8,100 | 246 | 270 | 1340 | 800 | 60 | 152 | 20 | 35 | 190 | 1580 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.68 |
| 3. Batac | Ilocos N. | I | 5 Nov. 87 | - | - | x | - | - | 340 | 9,545 | 11,100 | 68 | 79 | 1670 | 353 | 21 | 1020 | 107 | 525 | 8990 | 1900 | 7570 | 0.79 | 21.4 | 0 | 0 | 0 | 0 | 0.68 | |
| 4. Laoag, Bacarra | Ilocos N. | I | 5 Nov. 10 | x | - | - | - | - | 595 | 54,805 | 61,000 | 92 | 103 | 10330 | 3018 | 29 | 2815 | 47 | 148 | 787 | 11950 | 49830 | 0.91 | 16.5 | 4010 | 0.07 | 0.89 | | | |
| | Pasquin | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5. Vigan, Bantay | Ilocos S | I | 4 Nov. 7 | x | - | - | - | - | 189 | 17,129 | 18,700 | 91 | 99 | 3000 | 1005 | 34 | 1560 | 99 | 294 | 1692 | 3600 | 11800 | 0.81 | 13.7 | 2900 | 0.17 | 0.89 | | | |
| 6. Dagupan | Pangasinan | I | 18 Aug. 85 | x | - | - | - | - | 174 | 50,000 | 75,000 | 288 | 300 | 8000 | 4000 | 50 | 7850 | 157 | 314 | 1965 | 14500 | 14883 | 0.30 | 3.7 | 17810 | 0.36 | 0.44 | | | |
| 7. Lingayen | Pangasinan | I | 19 Aug. 2 | - | - | - | - | x | 348 | 23,900 | 29,200 | 69 | 84 | 2200 | 1200 | 55 | 1650 | 69 | 125 | 1375 | 5700 | 14280 | 0.60 | 11.9 | 22350 | 0.94 | 1.25 | | | |
| 8. Malasiqui | Pangasinan | I | 20 Aug. 1 | x | - | - | - | - | 59 | 7,100 | 7,800 | 120 | 132 | 1044 | 533 | 51 | 390 | 55 | 108 | 732 | 1500 | 4900 | 0.69 | 9.2 | 960 | 0.08 | 0.70 | | | |
| 9. Rosales | Pangasinan | I | 21 Aug. 4 | x | - | - | - | - | 51 | 7,500 | 8,700 | 147 | 171 | 1000 | 120 | 20 | 450 | 60 | 300 | 3750 | 1700 | 4525 | 0.60 | 37.7 | 155 | 0.02 | 0.54 | | | |
| 10. San Carlos | Pangasinan | I | 20 Aug. 2 | x | - | - | - | - | 127 | 10,400 | 11,500 | 82 | 91 | 1530 | 500 | 30 | 1000 | 96 | 320 | 2000 | 2200 | 6390 | 0.61 | 12.8 | 1150 | 0.10 | 0.66 | | | |
| 11. Urdaneta | Pangasinan | I | 20 Aug. 3 | - | x | - | - | - | 190 | 17,600 | 21,800 | 93 | 115 | 1420 | 418 | 25 | 545 | 31 | 123 | 1304 | 4300 | 1160 | 0.07 | 2.8 | 11345 | 0.65 | 0.57 | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12. Aparri | Cagayan | II | 7 Nov. 12 | (No data) | | | | | 97 | 17,200 | 19,900 | 177 | 205 | 3057 | 100 | 3 | 190 | 8 | 293 | 1900 | 3900 | 1170 | 0.10 | 17.7 | 9500 | 0.22 | 0.51 | | | |
| 13. Solana | Cagayan | II | 8 Dec. 7 | (No Operating) | | | | | 78 | 3,600 | 4,400 | 46 | 56 | 720 | No record | - | 0 | 0 | 0 | 0 | 900 | 3820 | 1.62 | - | 440 | 0.12 | 1.42 | | | |
| 14. Tuguegarao | Cagayan | II | 10 Nov. 8 Dec. 5 | x | - | - | - | - | 670 | 45,520 | 64,300 | 63 | 96 | 1668 | 408 | 11 | 760 | 34 | 310 | 1855 | 12500 | 12030 | 0.26 | 29.4 | 18000 | 0.40 | 0.41 | | | |
| 15. Ilagan | Isabela | II | 12 Nov. 6 | (No Data) | | | | | 77 | 14,773 | 16,100 | 192 | 209 | 2460 | 0 | 0 | 0 | 0 | 0 | 0 | 3100 | 3735 | 0.25 | - | 0 | 0 | 0.25 | | | |
| 16. Santiago | Isabela | II | 26 Nov. 5 | x | - | - | - | - | 184 | 19,050 | 23,200 | 104 | 126 | 3230 | 431 | 13 | 744 | 39 | 290 | 1726 | 4500 | 5900 | 0.31 | 13.7 | 2900 | 0.15 | 0.38 | | | |
| 17. Bayombong | Nueva Ecija | II | 25 Nov. 8 | x | - | - | - | - | 315 | 31,993 | 36,000 | 102 | 114 | 5386 | 1012 | 19 | 990 | 31 | 163 | 978 | 5900 | 14000 | 0.44 | 13.8 | 1780 | 0.06 | 0.44 | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18. Baliwag | Bulacan | III | 15 Jan. 10 | - | x | - | - | - | 325 | 38,690 | 50,300 | 119 | 154 | 6320 | 1200 | 19 | 3925 | 101 | 545 | 3270 | 9800 | 16320 | 0.42 | 13.6 | 3780 | 0.08 | 0.39 | | | |
| 19. Hagonoy | Bulacan | III | 22 Dec. 3 | - | - | - | x | - | 166 | 10,379 | 35,000 | 184 | 211 | 5058 | 932 | 18 | 2210 | 73 | 395 | 2370 | 6800 | 9040 | 0.30 | 9.7 | 3500 | 0.18 | 0.41 | | | |
| 20. Malolos | Bulacan | III | 18 Nov. 22 | - | - | - | x | - | 288 | 50,375 | 60,300 | 175 | 209 | 8082 | 2142 | 27 | 4575 | 93 | 355 | 2132 | 11800 | 17600 | 0.35 | 8.2 | 8200 | 0.16 | 0.40 | | | |
| 21. Meycauayan | Bulacan | III | 10 Dec. 32 | x | - | - | - | - | 288 | 45,095 | 57,100 | 198 | 250 | 7070 | 1900 | 27 | 2600 | 61 | 228 | 1370 | 11100 | 13100 | 0.29 | 6.9 | 6800 | 0.10 | 0.39 | | | |
| 22. Capan | Nueva Ecija | III | 12 Jan. 1 | - | - | - | x | - | 215 | 26,826 | 33,900 | 125 | 158 | 4380 | 486 | 11 | 1032 | 38 | 350 | 2120 | 6600 | 11460 | 0.43 | 23.6 | 2000 | 0.07 | 0.40 | | | |
| 23. Guimba | N. Ecija | III | 14 Jan. 4 | x | - | - | - | - | 87 | 12,357 | 14,600 | 142 | 168 | 2100 | 506 | 15 | 600 | 49 | 333 | 1360 | 2800 | 3500 | 0.28 | 11.4 | 3800 | 0.31 | 0.34 | | | |
| 24. San Jose | N. Ecija | III | 12 Jan. 5 | - | x | - | - | - | 166 | 24,400 | 30,400 | 147 | 183 | 4150 | 679 | 16 | 1700 | 46 | 425 | 2500 | 5900 | 9378 | 0.38 | 13.8 | 3500 | 0.23 | 0.45 | | | |
| 25. Angeles | Pampanga | III | 8 Oct. 10 | x | - | - | - | - | 380 | 66,000 | 124,000 | 158 | 248 | 11000 | 3194 | 29 | 11100 | 168 | 580 | 3475 | 31000 | 13070 | 0.20 | 4.2 | 13630 | 0.21 | 0.28 | | | |
| 26. Guagua | Pampanga | III | 6 Oct. 53 | x | - | - | - | - | 158 | 31,535 | 42,185 | 200 | 267 | 4585 | 1200 | 27 | 2900 | 94 | 345 | 2417 | 8200 | 9690 | 0.18 | 4.7 | 14080 | 0.44 | 0.47 | | | |
| 27. Lubao | Pampanga | III | 7 Oct. 3 | x | - | - | - | - | 101 | 16,232 | 21,100 | 161 | 209 | 2500 | 115 | 5 | 568 | 35 | 760 | 4908 | 3690 | 3780 | 0.29 | 22.3 | 7390 | 0.45 | 0.54 | | | |
| 28. Macabebe | Pampanga | III | 7 Oct. 7 | - | - | x | - | - | 228 | 28,633 | 38,777 | 126 | 170 | 4405 | 486 | 11 | 1254 | 46 | 380 | 2580 | 7560 | 10350 | 0.36 | 21.3 | 18700 | 0.65 | 0.73 | | | |
| 29. San Fernando | Pampanga | III | 6 Oct. 27 | - | - | - | x | - | 656 | 71,557 | 90,653 | 109 | 138 | 10492 | 1211 | 12 | 2530 | 35 | 307 | 2090 | 22400 | 14640 | 0.20 | 12.1 | 65690 | 0.92 | 0.85 | | | |
| 30. Causling | Tarlac | III | 8 Oct. 5 | - | - | x | - | - | 134 | 15,300 | 17,800 | 114 | 133 | 2180 | 354 | 18 | 1450 | 43 | 260 | 1840 | 3500 | 4576 | 0.30 | 12.9 | 3600 | 0.24 | 0.44 | | | |
| 31. Concepcion | Tarlac | III | 6 Oct. 1 | x | - | - | - | - | 61 | 12,100 | 16,800 | 197 | 275 | 1300 | 212 | 16 | 290 | 20 | 126 | 1132 | 3300 | 7640 | 0.63 | 36.0 | 1600 | 0.13 | 0.85 | | | |
| 32. Paniqui | Tarlac | III | 7 Oct. 11 | - | x | - | - | - | 101 | 14,000 | 17,700 | 138 | 175 | 2000 | 534 | 27 | 620 | 44 | 165 | 1161 | 3400 | 4420 | 0.32 | 8.3 | 3300 | 0.24 | 0.44 | | | |

(*) Duplicated numbers not included in totals

ADMINISTRATION
SURVEY
R IIO SYSTEMS

TABLE 1
SHEET 2 of 4

| BASIS FOR PROJECT | FEASIBLE IMPROVEMENTS | | | | | | | ENGINEERING WORK | | | IMPROVEMENT WORKS | | | | | | | FOR PARTIAL IMPROVEMENT | | | | | | | | |
|-------------------|--|-------------------|-------------------------|--|-------------------------|----------------------|---------------------------|--|---------------------------------|------------------------------|-------------------------------------|---------|---------|---------|----------------------------------|-------------|------------------------|--|---------|---------|---------|------------------------------------|------|------|-------------|------------------------|
| | COMPLETE | | | PARTIAL | | EMERGENCY | | SPECIAL STUDIES | | | WHERE BOTH COL'S. 29 & 30 ARE "YES" | | | | | | | WHERE COL'S 29 IS "YES", COL. 30 IS "NO" | | | | | | | | |
| | INTERNAL APPROPRIATE TO TOTAL COST FEASIBLE? | TOTAL COST P 1000 | COST PER SQ. METER 1968 | PARTIAL COST (IF YES IN COLS 29 & 30) P 1000 | COST PER SQ. METER 1968 | IS SUCH WORK NEEDED? | COST FOR SUCH WORK P 1000 | IS SPECIAL ENGINEERING STUDY REQUIRED? | WHAT FIELDY (IF YES IN COL. 27) | COST OF SPECIAL STUDY P 1000 | METERS OF PIPE | | | | INTERNAL DISTRIBUTION (RECHARGE) | WELLS (NO.) | ELEVATED STORAGE TANKS | METERS OF PIPE | | | | INTERNAL DISTRIBUTION (RECHARGE) | | | WELLS (NO.) | ELEVATED STORAGE TANKS |
| | | | | | | | | | | | 250 mm. | 300 mm. | 180 mm. | 100 mm. | | | | 250 mm. | 300 mm. | 180 mm. | 100 mm. | | | | | |
| (29) | (30) | (31) | (32) | (33) | (34) | (35) | (36) | (37) | (38) | (39) | (40) | (41) | (42) | (43) | (44) | (45) | (46) | (47) | (48) | (49) | (50) | (51) | (52) | (53) | (54) | (55) |
| No | Yes | (33169) | (107) | (10500) | (34) | Yes | 4470 | Yes | W.F.C. 10 S.V. (10) | 1000 | - | - | - | - | - | - | (2750) (2470) | (5825) | - | - | (510) | - | (27) | - | - | |
| Yes | Yes | 3200 | 160 | - | - | No | - | - | - | - | - | - | 2000 | 2740 | 95 | 4 | 1 | - | - | - | - | - | - | - | - | - |
| Yes | Yes | 1443 | 109 | - | - | No | - | - | - | - | - | - | 1940 | 55 | 1 | - | - | - | - | - | - | - | - | - | - | - |
| Yes | Yes | 3620 | 179 | - | - | No | - | No | - | - | - | - | 7800 | 23 | 2 | 1 | - | - | - | - | - | - | - | - | - | - |
| No | No | - | - | - | - | No | - | Yes | GW | 500 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| No | No | - | - | - | - | No | - | Yes | GW | 500 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Yes | Yes | 1870 | 154 | - | - | No | - | No | - | - | - | 3240 | 2300 | 21 | - | - | - | - | - | - | - | - | - | - | - | - |
| Yes | Yes | 2620 | 151 | - | - | Yes | 300 | No | - | - | - | 970 | 3350 | 112 | - | - | - | - | - | - | - | - | - | - | - | - |
| Yes | Yes | 19732 | 105 | - | - | No | - | No | - | - | - | 7000 | 4400 | 276 | 12 | 3 | - | - | - | - | - | - | - | - | - | - |
| Yes | Yes | 5530 | 120 | - | - | No | - | - | - | - | 2875 | 1800 | 3100 | 4230 | 151 | - | - | - | - | - | - | - | - | - | - | - |
| Yes | Yes | 5240 | 142 | - | - | Yes | 5 | No | - | - | - | - | 5088 | 992 | 31 | 5 | 2 | - | - | - | - | - | - | - | - | - |
| Yes | Yes | 3962 | 102 | - | - | No | - | No | - | - | 2210 | - | 1160 | 165 | 2 | - | - | - | - | - | - | - | - | - | - | - |
| Yes | Yes | 2672 | 183 | - | - | No | - | No | - | - | - | - | - | 57 | 5 | 1 | - | - | - | - | - | - | - | - | - | - |
| Yes | Yes | 1220 | 162 | - | - | No | - | No | - | - | - | - | - | 91 | - | - | - | - | - | - | - | - | - | - | - | - |
| Yes | Yes | (1822) | (166) | - | - | No | - | Yes | GV | 500 | - | - | - | (66) | (1) | - | - | - | - | - | - | - | - | - | - | - |
| Yes | Yes | 1153 | 177 | - | - | Yes | 190 | No | - | - | - | 1330 | 1000 | 30 | - | - | - | - | - | - | - | - | - | - | - | - |
| Yes | Yes | 335 | 144 | - | - | No | - | No | - | - | - | - | 880 | 10 | - | - | - | - | - | - | - | - | - | - | - | - |
| Yes | Yes | 1072 | 64 | - | - | Yes | 50 | Yes | GW | 115 | - | - | - | 1030 | 62 | - | - | - | - | - | - | - | - | - | - | - |
| Yes | Yes | (7000) | (206) | - | - | Yes | 40 | Yes | GV | 500 | - | - | (3520) | (5360) | 248 | (4) | (2) | - | - | - | - | - | - | - | - | - |
| Yes | Yes | (2267) | (188) | - | - | No | - | Yes | GV | 500 | - | (225) | (4320) | (520) | (30) | - | - | - | - | - | - | - | - | - | - | - |
| Yes | Yes | 2823 | 105 | - | - | No | - | No | - | - | - | 3470 | 1030 | 72 | 2 | - | - | - | - | - | - | - | - | - | - | - |
| Yes | Yes | 1256 | 90 | - | - | Yes | 80 | No | - | - | - | 900 | 2800 | 30 | - | - | - | - | - | - | - | - | - | - | - | - |
| Yes | Yes | 2393 | 117 | - | - | Yes | 40 | No | - | - | - | 420 | 5700 | 80 | - | - | - | - | - | - | - | - | - | - | - | - |
| Yes | Yes | 2654 | 133 | - | - | Yes | 320 | Yes | GW | 200 | - | - | 1030 | 2680 | 30 | 3 | - | - | - | - | - | - | - | - | - | - |
| Yes | No | (28549) | (283) | (19760) | (197) | Yes | 150 | Yes | GV | 300 | - | - | - | - | - | - | 3950 2730 | - | 3560 | 8535 | - | 6 | - | - | - | - |
| Yes | No | (9795) | (265) | 7316 | 197 | No | - | Yes | GV | 200 | - | - | - | - | - | - | 7000 | 4500 | 1163 | 3565 | 188 | - | 2 | - | - | |
| Yes | Yes | 4923 | 167 | - | - | Yes | 120 | No | - | - | 8570 | - | 50 | 79 | - | 1 | - | - | - | - | - | - | - | - | - | |
| Yes | No | (13760) | (318) | 8245 | 191 | Yes | 30 | No | - | - | - | - | - | - | - | - | 6900 | 3460 | 6680 | 6820 | 90 | - | - | - | - | |
| Yes | No | (8324) | (252) | 6426 | 195 | Yes | 100 | No | - | - | - | - | - | - | - | - | 435 | 2550 | 3270 | 7200 | 325 | - | 1 | - | - | |
| Yes | Yes | 2692 | 167 | - | - | Yes | 230 | No | - | - | - | 3900 | 16 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Yes | Yes | 26234 | 207 | - | - | Yes | 10 | No | - | - | 5200 | 25000 | 14100 | 790 | 12 | 2 | - | - | - | - | - | - | - | - | - | - |
| | | | | | | | | | | | | | | | | | (3) | 530 m - 100 mm 2100 m - 300 mm | | | (4) | 2800 m - 400 mm 7150 m - 300 mm | | | | |

LOCAL WATER UTILITIES ADM
WATER SYSTEM PLANNING 1
100 CITIES STUDY-DATA SUMMARY PD

| TOWN | PROVINCE | REGION | DATE VISITED | ECONOMIC INDEX | WATER SYSTEM OPERATION | | | | SERVICE AREA | | | | | | | WATER SUPPLY | | | | | DISTRIBUTION PIPE | | | | | | |
|---------------------------------------|---------------|--------|--------------|----------------|----------------------------|--------------------------|--------------------------------|---------------|-----------------|-----------------|---------------------|------|---------------------------|-----------------------|--------------------------|-----------------------|--------------------|------------------------------|-------------------------------|---------------------------|-----------------------|--------------------|------------------------|-----------------------|-------|--------------------|------|
| | | | | | IS IT AVAILABLE (POWER 5%) | DOES IT BREAK/EVEN? (5%) | IS THERE A LARGE DEFICIT (25%) | AREA HECTARES | POPULATION 1975 | POPULATION 1988 | PEPSONS PER HECTARE | | NUMBER OF HOUSEHOLDS 1975 | NUMBER OF CONNECTIONS | % HOUSEHOLDS CONNECTIONS | OR DATE VISITED (CMD) | LITERS/PERSON 1975 | LITERS/PERSON CONNECTED 1975 | LITER/CONNECTION DATE VISITED | WATER RELEASED 1988 (CMD) | EXISTING | | RECOMMENDED | | TOTAL | | |
| | | | | | | | | | | | 1975 | 1983 | | | | | | | | | LENGTH 275mm (METERS) | METERS/PERSON 1975 | METERS/CONNECTION 1975 | LENGTH 275mm (METERS) | | METERS/PERSON 1975 | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) | (19) | (20) | (21) | (22) | (23) | (24) | (25) | (26) | (27) | (28) |
| 33. Olongapo | Zambales | III | 5 Aug. | 17 | - | x? | - | - | 513 | 156,650 | 308,600 | 305 | 600 | 25000 | 20000 | 80 | 2900 | 185 | 231 | 1450 | 80000 | 36927 | 0.24 | 1.9 | 21500 | 0.14 | 0.19 |
| 34. San Antonio | Zambales | III | 6 Aug. | 4 | - | - | - | x | 95 | 14,000 | 19,900 | 147 | 209 | 2500 | 214 | 9 | 2725 | 195 | 2162 | 2735 | 3900 | 4660 | 0.33 | 21.8 | 4740 | 0.34 | 0.47 |
| 35. Subic | Zambales | III | 6 Aug. | 5 | x | - | - | - | 55 | 10,661 | 15,200 | 195 | 240 | 1806 | 583 | 20 | 537 | 50 | 252 | 921 | 2590 | 3370 | 0.31 | 5.8 | 1940 | 0.18 | 0.40 |
| 36. Nauan | Batangas | IV | 8 Dec. | 2 | x | - | - | - | 187 | 17,760 | 20,200 | 95 | 108 | 3062 | 1000 | 35 | 2215 | 125 | 382 | 2215 | 3900 | 8110 | 0.46 | 8.1 | 7800 | 0.44 | 0.79 |
| 37. Lemery | Batangas | IV | 28 July | 3 | - | - | - | x | 99 | 13,500 | 17,200 | 136 | 173 | 2210 | 110 | 5 | 825 | 61 | 1200 | 7500 | 3400 | 4560 | 0.34 | 41.5 | 4850 | 0.33 | 0.35 |
| 38. Masugay | Batangas | IV | 29 July | 169 | (Not Operating) | | | | 103 | 18,700 | 22,700 | 180 | 220 | 3015 | 0 | 0 | 0 | 0 | 0 | 4400 | 1750 | 0.09 | - | 8540 | 0.46 | 0.45 | |
| 39. San Juan | Batangas | IV | 10 Dec. | 3 | - | - | - | x | 124 | 10,210 | 12,100 | 82 | 98 | 1835 | 698 | 28 | 1565 | 153 | 403 | 2242 | 2400 | 10770 | 1.05 | 15.4 | 3540 | 0.34 | 1.33 |
| 40. Tanaun | Batangas | IV | 18 Nov. | 2 | - | - | - | x | 168 | 14,796 | 17,300 | 88 | 103 | 2208 | 545 | 25 | 2130 | 144 | 580 | 3900 | 3400 | 4400 | 0.30 | 8.1 | 4320 | 0.29 | 0.50 |
| 41. Bifan, Cabuyao Sta. Rosa | Laguna | IV | 21 Jan. | 5 | - | x | - | - | 552 | 101,045 | 130,000 | 163 | 235 | 16178 | 2033 | 12 | 5457 | 60 | 480 | 2996 | 25000 | 37360 | 0.37 | 18.4 | 11400 | 0.11 | 0.38 |
| 42. Calamba | Laguna | IV | 21 July | 17 | - | - | - | x | 131 | 36,530 | 46,000 | 278 | 351 | 5985 | 1079 | 18 | 2205 | 60 | 335 | 2043 | 8300 | 7635 | 0.21 | 7.1 | 7730 | 0.21 | 0.33 |
| 43. Los Baños | Laguna | IV | 19 Jan. | 11 | x | - | - | - | 175 | 28,044 | 37,000 | 160 | 211 | 5652 | 1196 | 21 | 1565 | 56 | 263 | 1308 | 7200 | 6675 | 0.24 | 5.6 | 6080 | 0.22 | 0.34 |
| 44. Sta. Cruz | Laguna | IV | 27 Nov. | 7 | - | x | - | - | 220 | 33,565 | 78,800 | 152 | 176 | 5850 | 1080 | 18 | 2950 | 88 | 480 | 2731 | 7600 | 10960 | 0.33 | 10.1 | 3370 | 0.10 | 0.37 |
| 45. Siniloan | Laguna | IV | 25 Nov. | 3 | x | - | - | - | 57 | 11,587 | 14,600 | 203 | 256 | 2078 | 500 | 24 | 380 | 40 | 175 | 960 | 2800 | 4720 | 0.41 | 9.4 | 0 | 0 | 0.32 |
| 46. Boac | Marinduque | IV | 18 Nov. | 38 | - | - | - | x | 91 | 9,566 | 11,900 | 105 | 131 | 1720 | 778 | 45 | 2425 | 254 | 564 | 3123 | 2300 | 8440 | 0.88 | 10.8 | 0 | 0 | 0.71 |
| 47. Sta. Cruz | Marinduque | IV | 19 Nov. | 269 | - | - | - | x | 66 | 8,347 | 11,000 | 126 | 167 | 1395 | 600 | 43 | 1910 | 228 | 530 | 3180 | 2150 | 6930 | 0.83 | 11.6 | 0 | 0 | 0.63 |
| 48. Bongabong | Mindoro Occ | IV | 22 Oct. | 7 | x | - | - | - | 54 | 5,593 | 6,500 | 110 | 120 | 1005 | 166 | 16 | 0 | 0 | 0 | 0 | 1100 | No Data | | | 2330 | 0.39 | |
| 49. Naujan | Mindoro Occ | IV | 19 Oct. | 0.2 | x | - | - | - | 21 | 2,315 | 2,115 | 110 | 110 | 440 | 225 | 51 | 537 | 232 | 454 | 2387 | 380 | 3380 | 1.46 | 15.0 | 880 | 0.38 | 1.84 |
| 50. Pinamalayan | Mindoro Occ | IV | 21 Oct. | 2 | x | - | - | - | 108 | 11,638 | 16,796 | 108 | 136 | 1940 | 907 | 47 | 1700 | 146 | 310 | 1870 | 3300 | 4800 | 0.41 | 5.3 | 1050 | 0.09 | 0.35 |
| 51. Puerto Prin. | Palawan | IV | 18 Dec. | 6 | - | - | - | x | 248 | 23,200 | 34,000 | 94 | 137 | 3867 | 276 | 7 | 370 | 16 | 223 | 1340 | 6600 | 2780 | 0.12 | 10.1 | 8880 | 0.38 | 0.34 |
| 52. Atimonan | Quezon | IV | 23 Jan. | 3 | - | - | - | x | 65 | 11,744 | 12,028 | 181 | 185 | 2363 | 355 | 15 | 980 | 83 | 555 | 2760 | 2350 | 2110 | 0.18 | 5.9 | 965 | 0.08 | 0.26 |
| 53. Candelaria | Quezon | IV | 12 Jan. | 3 | - | - | - | x | 144 | 22,665 | 27,000 | 157 | 188 | 3777 | 567 | 15 | 2680 | 116 | 788 | 4726 | 5300 | 5950 | 0.26 | 10.5 | 4500 | 0.20 | 0.39 |
| 54. Nauban | Quezon | IV | 16 Jan. | 2 | - | - | - | x | 44 | 10,436 | 13,500 | 237 | 316 | 1933 | 681 | 35 | 900 | 86 | 220 | 1321 | 2700 | 4630 | 0.44 | 6.8 | 3700 | 0.33 | 0.60 |
| 55. Sariaya | Quezon | IV | 14 Jan. | 0.7 | x | - | - | - | 117 | 16,813 | 20,400 | 144 | 174 | 2587 | 1043 | 40 | 3820 | 227 | 560 | 3660 | 4000 | 3060 | 0.18 | 2.9 | 1820 | 0.11 | 0.24 |
| 56. Binangonan | Rizal | IV | 22 Dec. | 76 | - | - | - | x | 76 | 17,395 | 20,000 | 229 | 263 | 2676 | 543 | 20 | 1000 | 57 | 283 | 1842 | 3900 | 4607 | 0.26 | 8.5 | 3710 | 0.21 | 0.41 |
| 57. Legaspi, Daraga | Albay | V | 17 Sept. | 12 | x | - | - | - | 458 | 77,913 | 100,000 | 170 | 220 | 1220 | 2452 | 20 | 4900 | 63 | 714 | 1998 | 20000 | 16770 | 0.22 | 6.8 | 28190 | 0.36 | 0.63 |
| 58. Ligan, Oas | Albay | V | 23 Oct. | 2 | x | - | - | - | 188 | 32,744 | 37,020 | 474 | 197 | 5280 | 1330 | 25 | 2000 | 58 | 231 | 1436 | 7220 | 8020 | 0.24 | 6.0 | 4728 | 0.14 | 0.34 |
| 59. Polangui | Albay | V | 22 Oct. | 23 | x | - | - | - | 158 | 24,533 | 29,460 | 155 | 186 | 3774 | 1769 | 47 | 3700 | 150 | 322 | 2090 | 5700 | 13995 | 0.57 | 7.9 | 50 | - | 0.48 |
| 60. Tabaco | Albay | V | 16 Sept. | 9 | - | - | - | x | 181 | 30,578 | 43,250 | 169 | 219 | 5226 | 1558 | 30 | 1680 | 55 | 183 | 1078 | 10700 | 5670 | 0.19 | 3.6 | 16960 | 0.33 | 0.52 |
| 61. Iriga | Camarines Sur | V | 21 Oct. | 2 | Not Operating | | | | 125 | 32,400 | 33,000 | 100 | 102 | 4920 | 0 | C | 0 | 0 | 0 | 0 | 6400 | 8530 | 0.26 | - | 11970 | 0.37 | 0.62 |
| 62. Limnan, Camarines Sur | Camarines Sur | V | 26 Jan. | 0.2 | x | - | - | - | 82 | 11,710 | 16,100 | 143 | 196 | 1950 | 600 | 30 | 2230 | 190 | 619 | 3716 | 3100 | 700 | 0.06 | 1.2 | 3900 | 0.33 | 0.29 |
| 63. Magu, Canalligan Canaman, Nagaraa | Camarines Sur | V | 20 Oct. | 5 | x | - | - | - | 788 | 99,700 | 127,000 | 126 | 161 | 15340 | 2934 | 19 | 8659 | 87 | 450 | 2950 | 2500 | 16200 | 0.16 | 5.5 | 44330 | 0.44 | 0.48 |

LOCAL WATER UTILITIES ADL
 WATER SYSTEM PLANNING OF
 100 CITIES STUDY-DATA SUMMARY PC 1

| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | SERVICE AREA | | | | | | | WATER SUPPLY | | | | | | | | | | DISTRIBUTION PIPE | | | | |
|---------------------------------------|-------------|-----|---------|------|-----|-----|-----|-----|--------------|---------|---------|---------------------|------|---------------------------|-----------------------|-------------------------------|-----------------------|---------------|------|------------------------------|-------------------------|----------------------|-----------------|---------------|-----------------|-------------------|---------------|----|--|--|
| | | | | | | | | | (10) | (11) | (12) | PERSONS PER HECTARE | | NUMBER OF HOUSEHOLDS 1978 | NUMBER OF CONNECTIONS | % HOUSEHOLDS WITH CONNECTIONS | ON DATE VISITED (CMO) | LITERS/PERSON | | LITERS/PERSON CONSUMED DAILY | LITERS/CONNECTION DAILY | WATER REQUIRED (CMD) | EXISTING | | REQ./RECOMM. | | TOTAL P. 1988 | | | |
| | | | | | | | | | | | | 1979 | 1983 | | | | | 1978 | 1983 | | | | LENGTH (METERS) | METERS/PERSON | LENGTH (METERS) | METERS/PERSON | | | | |
| 64. Bato | Catanduanes | V | 22 Jan. | 0.7 | - | x | - | - | 64 | 5,536 | 6,400 | 86 | 100 | 939 | 383 | 41 | 860 | 155 | 380 | 2250 | 1250 | 2750 | 0.50 | 7.2 | 0 | 0 | 0.43 | Y. | | |
| 65. Virac | Catanduanes | V | 22 Jan. | 6 | x | - | - | - | 155 | 19,247 | 22,000 | 124 | 142 | 4325 | 1445 | 33 | 6300 | 127 | 980 | 4360 | 4300 | 9620 | 0.50 | 6.7 | 1300 | 0.07 | 0.50 | Y. | | |
| 66. Masbate | Masbate | V | 19 Jan. | 3 | - | x | - | - | 107 | 20,811 | 21,500 | 330 | 428 | 2780 | 556 | 20 | 920 | 38 | 188 | 1654 | 6200 | 5205 | 0.21 | 9.4 | 2600 | 0.11 | 0.29 | Y. | | |
| 67. Bulan | Sorsogon | V | 17 Sept | 1 | - | - | - | x | 74 | 24,480 | 31,600 | 330 | 428 | 2780 | 556 | 20 | 920 | 38 | 188 | 1654 | 6200 | 5205 | 0.21 | 9.4 | 2600 | 0.11 | 0.29 | Y. | | |
| 68. Sorsogon | Sorsogon | V | 16 Sept | 3 | x | - | - | - | 120 | 30,000 | 39,600 | 290 | 330 | 3530 | 997 | 28 | 1620 | 54 | 191 | 1629 | 7700 | 4910 | 0.16 | 4.2 | 3800 | 0.13 | 0.22 | Y. | | |
| 69. Kalibo | Aklan | VI | 20 Oct. | 4 | - | x | - | - | 132 | 13,700 | 17,400 | 104 | 167 | 2740 | 399 | 15 | 615 | 45 | 308 | 1540 | 3400 | 6570 | 0.48 | 16.5 | 4160 | 0.30 | 0.62 | Y. | | |
| 70. San Jose | Antique | VI | 16 Nov. | 2 | - | - | - | x | 146 | 12,680 | 16,200 | 87 | 111 | 2559 | 644 | 25 | 2370 | 187 | 742 | 3680 | 3200 | 5995 | 0.47 | 9.3 | 2950 | 0.23 | 0.55 | Y. | | |
| 71. Sibulan | Antique | VI | 17 Nov. | 0.4 | - | - | - | - | 51 | 5,060 | 6,000 | 99 | 118 | 900 | 86 | 10 | 268 | 53 | 550 | 3100 | 1170 | 740 | 0.15 | 8.6 | 2270 | 0.45 | 0.50 | Y. | | |
| 72. Roxas | Capiz | VI | 21 Oct. | 5 | - | x | - | - | 132 | 24,147 | 31,300 | 183 | 237 | 4000 | 1118 | 28 | 2500 | 104 | 373 | 2236 | 6000 | 25930 | 1.07 | 23.2 | 0 | 0 | 0.83 | Y. | | |
| 73. Dingle, Poitan Iloilo, Pavia | Iloilo | VI | 23 Oct. | 0.8 | - | x | - | - | 145 | 10,532 | 12,200 | 73 | 84 | 1651 | 895 | 54 | 2600 | 247 | 484 | 2905 | 2300 | 7945 | 0.75 | 8.9 | 370 | 0.04 | 0.68 | Y. | | |
| 74. Sta. Barbara Cabatuan Masin | Iloilo | VI | 23 Oct. | 23 | - | x | - | - | 1526 | 194,000 | 217,000 | 127 | 142 | 32013 | 2253 | 16 | 18940 | 98 | 553 | 3600 | 53000 | 59360 | 0.31 | 11.3 | 11090 | 0.06 | 0.32 | Y. | | |
| 75. Binalbagan | Negros Occ | VI | 5 Jan. | 42 | - | - | x | - | 86 | 14,641 | 19,400 | 170 | 226 | 2208 | 334 | 15 | 210 | 24 | 160 | 1048 | 3300 | 5587 | 0.38 | 16.7 | 2320 | 0.16 | 0.41 | Y. | | |
| 76. Cadiz | Negros Occ | VI | 2 Sept | 24 | - | - | - | x | 106 | 26,300 | 29,200 | 248 | 275 | 5319 | 629 | 12 | 680 | 26 | 215 | 1081 | 5700 | 4685 | 0.18 | 7.4 | 9500 | 0.34 | 0.49 | Y. | | |
| 77. La Carlota | Negros Occ | VI | 7 Jan. | 354 | - | - | - | x | 134 | 16,159 | 18,000 | 121 | 134 | 2490 | 700 | 28 | 560 | 60 | 220 | 1430 | 3500 | 5180 | 0.32 | 7.4 | 800 | 0.05 | 0.33 | Y. | | |
| 78. La Castellana | Negros Occ | VI | 6 Jan. | 31 | x | - | - | - | 53 | 11,929 | 14,000 | 225 | 264 | 1819 | 491 | 27 | 750 | 65 | 248 | 1530 | 2700 | 4385 | 0.37 | 8.9 | 340 | 0.05 | 0.34 | Y. | | |
| 79. San Carlos | Negros Occ | VI | 3 Sept | 120 | - | - | - | x | 100 | 29,600 | 42,800 | 296 | 428 | 4620 | 836 | 18 | 2700 | 91 | 506 | 3230 | 8400 | 5655 | 0.19 | 6.8 | 6664 | 0.23 | 0.29 | Y. | | |
| 80. Bilay | Negros Occ | VI | 1 Sept | 75 | - | x | - | - | 273 | 34,700 | 38,800 | 127 | 142 | 5500 | 995 | 18 | 2000 | 58 | 320 | 2010 | 7600 | 15000 | 0.43 | 15.1 | 17450 | 0.30 | 0.84 | Y. | | |
| 81. Talisay | Negros Occ | VI | 8 Jan. | 51 | x | - | - | - | 71 | 24,469 | 27,500 | 345 | 387 | 3675 | 240 | 7 | 234 | 10 | 270 | 1800 | 5500 | 5240 | 0.21 | 21.8 | 2790 | 0.14 | 0.29 | Y. | | |
| 82. Loon | Bahol | VII | 6 Jan. | 2 | - | - | - | x | 122 | 8,000 | 8,400 | 65 | 69 | 1370 | 452 | 33 | 700 | 88 | 262 | 1550 | 1500 | 3950 | 0.42 | 8.7 | 3900 | 0.49 | 0.31 | Y. | | |
| 83. Tabilaran | Bahol | VII | 5 Jan. | 29 | x | - | - | - | 108 | 42,213 | 50,400 | 111 | 123 | 4663 | 2555 | 55 | 4990 | 110 | 200 | 1953 | 9800 | 20990 | 0.46 | 8.2 | 13300 | 0.29 | 0.68 | Y. | | |
| 84. Bogo | Cebu | VII | 2 Dec. | 3 | - | - | x | - | 55 | 14,379 | 15,000 | 258 | 273 | 2570 | 384 | 15 | 1510 | 106 | 700 | 3930 | 2940 | 3785 | 0.27 | 9.9 | 1900 | 0.13 | 0.38 | Y. | | |
| 85. Carcar | Cebu | VII | 3 Dec. | 0.5 | - | - | - | x | 107 | 15,515 | 16,300 | 145 | 152 | 2585 | 435 | 17 | 1230 | 79 | 471 | 2827 | 2800 | 2090 | 0.13 | 4.8 | 2000 | 0.13 | 0.25 | Y. | | |
| 86. Dalaguete | Cebu | VII | 4 Dec. | 0.1 | x | - | - | - | 147 | 6,063 | 6,700 | 41 | 46 | 1047 | 576 | 55 | 750 | 123 | 224 | 1302 | 1300 | 2770 | 0.46 | 4.8 | 1690 | 0.28 | 0.67 | Y. | | |
| 87. Danao | Cebu | VII | 4 Dec. | 7 | - | - | - | x | 73 | 14,596 | 15,990 | 200 | 219 | 2658 | 778 | 29 | 2012 | 138 | 471 | 2586 | 3100 | 3584 | 0.25 | 4.6 | 2060 | 0.14 | 0.35 | Y. | | |
| 88. Toledo | Cebu | VII | 5 Dec. | 1235 | - | - | - | x | 64 | 12,800 | 20,000 | 200 | 312 | 2250 | 347 | 15 | 1020 | 80 | 320 | 2940 | 3900 | 5425 | 0.42 | 15.6 | 2570 | 0.20 | 0.40 | Y. | | |
| 89. Tuburan | Cebu | VII | 2 Dec. | 1 | - | - | - | x | 46 | 6,190 | 6,620 | 135 | 144 | 1140 | 285 | 25 | 273 | 44 | 176 | 958 | 1300 | 730 | 0.12 | 2.6 | 1630 | 0.26 | 0.36 | Y. | | |
| 90. Dumaguete | Negros Or | VII | 3 Dec. | 29 | - | - | - | x | 168 | 34,764 | 35,400 | 94 | 96 | 5432 | 1869 | 34 | 4373 | 152 | 441 | 2750 | 8300 | 14960 | 0.43 | 8.0 | 2750 | 0.08 | 0.50 | Y. | | |
| 91. Guihuligan | Negros Or | VII | 4 Sept | 7 | - | - | - | x | 94 | 7,600 | 8,800 | 81 | 94 | 1270 | 121 | 10 | 440 | 57 | 578 | 3636 | 2300 | 2360 | 0.23 | 19.5 | 8170 | 0.78 | 0.88 | Y. | | |
| 92. Tagbilaran | Negros Or | VII | 2 Dec. | 7 | - | - | - | - | 140 | 20,753 | 21,600 | 148 | 154 | 3243 | 500 | 16 | 1246 | 60 | 390 | 2500 | 4200 | 3005 | 0.14 | 6.0 | 1800 | 0.09 | 0.22 | Y. | | |

INSTRUMENTATION
SURVEY
RINO SYSTEMS

TABLE 1
SHEET 4 of 4

| BASIS FOR PROJECT | FEASIBLE IMPROVEMENTS | | | | | | | ENGINEERING WORK SPECIAL STUDIES | | | IMPROVEMENT WORKS WHERE BOTH COLS. 29 & 30 ARE "YES" | | | | | | FOR PARTIAL IMPROVEMENT WHERE COL'S 29 IS "YES", COL. 30 IS "NO" | | | | | | | | | |
|-------------------|-----------------------|---------------------------|--|---------------------------|----------------------|----------------------------|---------|--------------------------------------|---------------------------------|-------------------------------|--|---------|---------|---------|---------------------------------|------------|--|-----------------------|---------|---------|--------|---------------------------------|------------|------------------------|------|------|
| | COMPLETE | | PARTIAL | | EMERGENCY | | | IS SPECIAL ENGINEERING STUDY NEEDED? | WHAT FIELD? (IF YES IN COL. 29) | COST OF SPECIAL STUDY P. 1000 | METERS OF PIPE | | | | INTERNAL DISTRIBUTION (MUTUALS) | WELLS (NO) | ELEVATED STORAGE TANKS | METERS OF PIPE | | | | INTERNAL DISTRIBUTION (MUTUALS) | WELLS (NO) | ELEVATED STORAGE TANKS | | |
| | TOTAL COST P. 1000 | COST PER 1000 PERSON 1983 | PARTIAL COST (IF YES IN COLS. 29 & 30) P. 1000 | COST PER 1000 PERSON 1983 | IS MUCH WORK NEEDED? | COST FOR SUCH WORK P. 1000 | 250 mm. | | | | 300 mm. | 180 mm. | 100 mm. | 250 mm. | | | | 300 mm. | 180 mm. | 100 mm. | | | | | | |
| (28) | (30) | (31) | (32) | (33) | (34) | (35) | (36) | (37) | (38) | (39) | (40) | (41) | (42) | (43) | (44) | (45) | (46) | (47) | (48) | (49) | (50) | (51) | (52) | (53) | (54) | (55) |
| Yes | Yes | (3650) | (183) | - | - | Yes | 10 | Yes | GV | 500 | - | (1000) | (1800) | (720) | 168 | - | - | - | - | - | - | - | - | - | - | - |
| Yes | Yes | 4044 | 153 | - | - | No | - | No | - | - | - | 1700 | - | - | 45 | - | 2 | - | - | - | - | - | - | - | - | - |
| Yes | Yes | 3826 | 129 | - | - | No | - | No | - | - | - | - | 3760 | 2800 | 14 | 2 | - | - | - | - | - | - | - | - | - | - |
| Yes | Yes | (2620) | (187) | - | - | Yes | 90 | Yes | GV | 500 | - | (930) | (1850) | (2640) | (52) | - | (1) | - | - | - | - | - | - | - | - | - |
| Yes | Yes | 3490 | 165 | (3006) | (142) | No | - | No | - | - | - | - | 2900 | 5420 | 68 | 2 | - | - | - | - | - | - | - | - | - | - |
| Yes | No | (2233) | (223) | (1890) | (189) | No | - | Yes | GV | 200 | - | - | - | - | - | - | - | - | - | 320 | - | 52 | 2 | - | - | - |
| Yes | Yes | 2213 | 83 | - | - | No | - | No | - | - | - | - | - | 3300 | 75 | - | - | - | - | - | - | - | - | - | - | - |
| No | No | - | - | - | - | Yes | 200 | Yes | GV | 200 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Yes | Yes | (6808) | (153) | - | - | No | - | Yes | GV | 1000 | - | - | - | (7600) | 180 | - | - | - | - | - | - | - | - | - | - | - |
| Yes | No | (14700) | (313) | (11760) | (250) | No | - | Yes | GV | 600 | - | - | - | - | - | - | - | (12000) ⁸⁾ | - | (2200) | (6900) | 200 | - | - | - | - |
| Yes | Yes | 2609 | 130 | - | - | Yes | 20 | No | - | - | - | - | 1240 | 1900 | 102 | - | 2 | - | - | - | - | - | - | - | - | - |
| Yes | No | (5320) | (263) | 3800 | 188 | Yes | 15 | No | - | - | - | - | - | - | - | - | - | - | - | - | 1360 | 115 | - | - | - | - |
| Yes | Yes | 2628 | 146 | - | - | Yes | 50 | No | - | - | - | - | 760 | 3740 | 80 | 1 | 1 | - | - | - | - | - | - | - | - | - |
| Yes | Yes | 3479 | 91 | - | - | Yes | 50 | Yes | GV | 80 | - | - | 1,200 | 2310 | 133 | - | - | - | - | - | - | - | - | - | - | - |
| Yes | Yes | 7862 | 120 | - | - | Yes | 80 | No | - | - | - | 2400 | 7100 | 7200 | 165 | 3 | - | - | - | - | - | - | - | - | - | - |
| Yes | Yes | 9452 | 172 | - | - | Yes | 30 | No | - | - | - | 320 | 8160 | 2080 | 296 | 7 | 1 | - | - | - | - | - | - | - | - | - |
| Yes | Yes | (8586) | (200) | - | - | Yes | 10 | Yes | GV | 200 | (2790) ⁹⁾ | (1000) | (820) | (1050) | 167 | (9) | (1) | - | - | - | - | - | - | - | - | - |
| Yes | Yes | 5840 | 178 | - | - | Yes | 50 | No | - | - | - | - | 1420 | 3160 | 260 | 4 | 1 | - | - | - | - | - | - | - | - | - |
| - | - | 63 | 63 | 16 | 16 | - | 58 | - | - | 49 | 66 | 66 | 66 | 66 | 66 | 66 | 60 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| - | - | 273635 | - | 79304 | - | 58 | 19031 | 48 | - | 5871 | 16165 | 36034 | 31318 | 191177 | 7972 | 159 | 23 | 36635 ¹⁰⁾ | 31520 | 53133 | 89780 | 1949 | 34 | 5 | - | - |
| - | - | 4210 | 140 | 4956 | 187 | - | 328 | - | - | 324 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

BEST AVAILABLE COPY

(8) 350 mm
(9) 1000 mm - 400 mm
350 mm - 350 mm
300 mm - 300 mm
1050 mm - 250 mm
(10) 4200 mm - 400 mm
11965 mm - 350 mm
(11) 2400 mm - 400 mm
15,000 mm - 350 mm
17,000 mm - 250 mm

LOCAL WATER UTILITIES AND
WATER SYSTEM PLANNING
100 CITIES STUDY-DATA SUMMARY F

| TOWN | PROVINCE | REGION | DATE WRITTEN | ECONOMIC INDEX | WATER SYSTEM OPERATION | | | | SERVICE AREA | | | | | | | | | WATER SUPPLY | | | | | | DISTRIBUTION PIPE | | | | | |
|-------------------------------|--------------------|--------|--------------|----------------|---|--|---|---|---------------|-----------------|-----------------|---------------------|-------|---------------------------|-----------------------|-------------------------------|-----------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-------------------|-------|-------------|------|-------|------|
| | | | | | IS IT FEASIBLE TO TREAT WATER BY BREAKDOWN (YES/NO) (%) | IS IT FEASIBLE TO TREAT WATER BY BREAKDOWN (NO/NO) (%) | IS IT FEASIBLE TO TREAT WATER BY BREAKDOWN (18% to 25%) | IS IT FEASIBLE TO TREAT WATER BY BREAKDOWN (12-25%) | AREA HECTARES | POPULATION 1976 | POPULATION 1988 | PERSONS PER HECTARE | | NUMBER OF HOUSEHOLDS 1975 | NUMBER OF CONNECTIONS | % HOUSEHOLDS WITH CONNECTIONS | ON DATE VISITED (CND) | LITERS/PERSON 1975 | LITERS/PERSON 1976 | LITERS/PERSON 1977 | LITERS/PERSON 1978 | LITERS/PERSON 1979 | LITERS/PERSON 1980 | EXISTING | | RECOMMENDED | | TOTAL | |
| | | | | | | | | | | | | 1976 | 1988 | | | | | | | | | | | (20) | (21) | (22) | (23) | | (24) |
| 93. Baybay | Leyte del N | VIII | 5 Jan. | 0.8 | - | - | - | x | 168 | 20,190 | 21,600 | 120 | 129 | 3413 | 1132 | 33 | 1000 | 49 | 160 | 883 | 4200 | 5120 | 0.25 | 4.5 | 2520 | 0.12 | 0.35 | | |
| 94. Carigara, Butuga, Tunga | Leyte del N | VIII | 8 Jan. | 0.3 | - | x | - | - | 198 | 24,470 | 26,500 | 123 | 134 | 3951 | 1114 | 28 | 3270 | 134 | 478 | 2935 | 5200 | 15230 | 0.62 | 13.7 | 0 | 0 | 0.37 | | |
| 95. Ormoc | Leyte del N | VIII | 7 Jan | 12 | x | - | - | - | 140 | 27,237 | 29,600 | 195 | 211 | 4768 | 1164 | 24 | 2917 | 107 | 440 | 2500 | 5800 | 7560 | 0.28 | 6.5 | 4960 | 0.28 | 0.42 | | |
| 96. Maasin | Leyte del N | VIII | 6 Jan. | 2 | x | - | - | - | 105 | 12,579 | 14,000 | 120 | 133 | 2231 | 913 | 41 | 1640 | 130 | 318 | 1796 | 2700 | 4910 | 0.39 | 5.4 | 3570 | 0.28 | 0.61 | | |
| 97. Catarman | N. Samar | VIII | 3 Sept | 5 | (Not Operating) | - | - | - | 68 | 15,600 | 21,100 | 231 | 310 | 2560 | 0 | 0 | 0 | 0 | 0 | 0 | 4100 | 0 | 0 | 0 | 0 | 0 | 0.29 | | |
| 98. Masay | N. Samar | VIII | 18 Dec | 0.5 | - | x | - | - | 52 | 9,259 | 10,000 | 178 | 192 | 1744 | 137 | 8 | 960 | 104 | 1320 | 7000 | 1950 | 4800 | 0.52 | 35.0 | 0 | 0 | 0.48 | | |
| 99. Calbayog | N. Samar | VIII | 5 Sept | 1 | - | - | - | x | 84 | 21,500 | 26,000 | 257 | 319 | 3360 | 500 | 15 | 900 | 48 | 279 | 1800 | 5200 | 5450 | 0.25 | 10.2 | 3300 | 0.15 | 0.33 | | |
| 100. Cathaganan | N. Samar | VIII | 1 Sept | 5 | - | - | - | x | 69 | 21,300 | 23,700 | 309 | 343 | 3125 | 770 | 25 | 870 | 38 | 154 | 1065 | 4600 | 3410 | 0.16 | 4.4 | 2740 | 0.13 | 0.26 | | |
| 101. Dipolog | Saranggani del Sur | IX | 3 Feb | 5 | - | x | - | - | 243 | 34,550 | 44,400 | 142 | 181 | 4783 | 563 | 12 | 1200 | 35 | 295 | 2130 | 8700 | 6600 | 0.19 | 11.7 | 7600 | 0.22 | 0.32 | | |
| 102. Pagadian | Saranggani del Sur | IX | 5 Feb. | 2 | - | - | - | x | 215 | 34,946 | 47,000 | 163 | 219 | 5907 | 1142 | 19 | 1300 | 37 | 190 | 1140 | 9200 | 5830 | 0.17 | 5.1 | 9100 | 0.26 | 0.32 | | |
| 103. Malaybalay | Bukidnon | X | 2 Feb. | 1 | - | - | - | x | 102 | 16,203 | 20,000 | 159 | 196 | 2560 | 799 | 31 | 2480 | 153 | 490 | 3100 | 3900 | 6035 | 0.37 | 7.6 | 3140 | 0.19 | 0.46 | | |
| 104. Oroquieta | Misamis Occ | X | 5 Feb. | 3 | - | x | - | - | 231 | 18,803 | 20,200 | 81 | 87 | 2970 | 875 | 29 | 1530 | 81 | 276 | 1750 | 3900 | 5275 | 0.32 | 6.8 | 1360 | 0.07 | 0.36 | | |
| 105. Gingoog | Misamis Or. | X | 4 Feb. | 2 | - | x | - | - | 100 | 16,545 | 18,000 | 165 | 180 | 2689 | 454 | 17 | 1300 | 78 | 463 | 2865 | 3500 | 3080 | 0.19 | 6.8 | 4500 | 0.27 | 0.42 | | |
| 106. Surigao | Surigao del N | X | 29 Jan | 33 | x | - | - | - | 324 | 29,356 | 37,500 | 91 | 116 | 4747 | 2168 | 46 | 10240 | 349 | 774 | 4723 | 8800 | 14590 | 0.50 | 6.7 | 3930 | 0.13 | 0.49 | | |
| 107. Bislig | del S | X | 26 Jan | 17 | - | - | - | x | 184 | 38,530 | 65,500 | 209 | 356 | 6626 | 400 | 6 | 980 | 25 | 420 | 2450 | 12800 | 3400 | 0.09 | 8.5 | 10400 | 0.27 | 0.29 | | |
| 108. Tagum | Davao del N | XI | 4 Feb | 23 | (Not yet in op'n) | - | - | - | 296 | 31,051 | 54,800 | 105 | 185 | 5234 | 0 | 0 | 0 | 0 | 0 | 0 | 10700 | 580 | 0.02 | - | 10480 | 0.34 | 0.20 | | |
| 109. Mati | Davao Or. | XI | 2 Feb | 14 | x | - | - | - | 167 | 26,174 | 42,000 | 157 | 257 | 4290 | 152 | 4 | 130 | 5 | 140 | 855 | 8400 | 1990 | 0.08 | 13.1 | 5660 | 0.22 | 0.18 | | |
| 110. Digos | Davao del S | XI | 5 Feb | 2 | x | - | - | - | 377 | 23,415 | 32,800 | 62 | 87 | 3900 | 296 | 8 | 780 | 33 | 440 | 2635 | 6400 | 3360 | 0.23 | 18.1 | 4580 | 0.20 | 0.30 | | |
| Number used for Total/Average | | | | | 106 | 103 | 103 | 103 | 103 | 110 | 110 | 110 | 110 | 110 | 112 | 104 | 104 | 110 | 103 | 103 | 103 | 110 | 108 | 108 | 104 | 109 | 108 | 109 | |
| Total | | | | | 3364 | 40 | 20 | 8 | 35 | - | 2879538 | 3720074 | 16747 | 20777 | 46258 | 114245 | - | - | - | - | 244756 | - | 915059 | - | - | 463597 | - | - | |
| Average | | | | | 32 | - | - | - | - | 187 | 26178 | 33819 | 152 | 189 | 4205 | 1099 | 25 | 2236 | 91 | 397 | 2376 | 7000 | 8473 | 0.37 | 11 | 6270 | 0.24 | 0.30 | |

ENVIRONMENTAL ANALYSIS

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ENVIRONMENTAL ANALYSIS

A. GENERAL

The consideration of certain environmental factors has been a necessary part of the decision-making process in analyzing the project. On a macroscale, the project is a means of controlling and providing one environmental asset - water - for the needs of people in a developing community.

To provide basic water supply, the project will involve the installation of deep and/or shallow wells; diversion or intake structure; treatment facilities; distribution system storage facilities; pumps, valves and other machinery; customer meters and fire hydrants; and a network of pipelines along streets, roads, highways and other rights-of-way (generally following normal routes of transport) specifically acquired for these purposes. Each component of the project, as it is constructed, will have a local environmental effect in terms of land use, construction activities, and final aesthetics. In the sense of a treatment plant's use of chemicals and power, and in the use of power for pumping water, there will be the wider environmental effect of depleting natural resources.

B. PROBABLE ENVIRONMENTAL EFFECTS

Soil Erosion

A short-term adverse impact will result from soil erosion and dust during construction of transmission and distribution pipelines.

Activities such as urban, roadway and pipeline construction, and agricultural development increase the sediments carried into the streams. Agricultural development may increase erosion four to nine times while urban construction may increase erosion 100 times. When surface water has excess quantities of sediment, the following adverse conditions are experienced:

1. Impairment of recreational values.
2. Reduction in fish propagation.
3. Increased cost of water treatment.
4. Reduction of sunlight penetration.

5. Clogging of stream channels.
6. Loss of storage capacity in reservoirs.

Increased attention has been given recently to the effects of urbanization and construction activities on soil erosion. Concern centers on the resulting sedimentation, i. e. the transport and deposition of soil sediment in receiving waters. Urbanization and construction activities increase sedimentation in two major ways. First, the general increase in peak storm runoff increases the erosion potential. Second, the clearing, leveling, and bulldozing of land for construction expose soil to erosive forces. Certain construction practices tend to increase erosion much more than is necessary.

Good planning cannot eliminate all potential sedimentation problems and certain physical controls may be desirable. Permanent physical controls should be installed as quickly as possible in construction areas. These may include sodded diversion terraces, sod on steep cut or fill banks, and ponds that can be drained and cleaned as necessary during and after construction. Recognition should be given to the limited ability of small ponds or detention basins to remove the clay-sized particles which increase turbidity. More effective methods may be necessary. Where permanent controls cannot be used because of heavy traffic, delays in installing utilities, etc., then mulch, temporary seeding, straw bales, and temporary detention dams, or some combination thereof, may be appropriate.

Dust problems during construction may be minimized by routine sprinkling of the construction area and returning the excavated area to its original state as soon as possible.

The erosion and dust problem can be minimized by the inclusion of strict erosion and dust control criteria in the contract specifications.

Noise

During the construction period, noise associated with heavy equipment and traffic will occur near the construction sites. This temporary disruption will have only a moderate short-term impact. Wells with electric motors or engines and treatment plants will be moderately noisy. Such equipment must be housed within concrete (or block) structures so that noise transmitted is minimal.

Aesthetics

The transmission and distribution lines will be installed below ground level, the surfaces of which will then be returned to original condition. The treatment, storage, pumping, and other supporting facilities and equipment are relatively inconspicuous and will have little or no adverse effect on the existing environment. To minimize the adverse effect on the existing environment, the design of physical facilities must be done unobtrusively and in harmony with the surrounding areas.

Increase in Wastewater

A long-term adverse effect of the water supply project is the unavoidable increase in wastewater. As the available water supply increases, so will wastewater increase. Water-flush toilets are expected to increase in use as local economy progresses.

The additional volumes of wastewater that improved waterworks will generate are anticipated to be disposed of through the same means being used throughout the Philippines, i. e. , septic tanks, cesspools, and through surface drains in ditches or gutters. In terms of being a burden to the existing surface drainage facilities, or causing flooding, wastewater is insignificant by comparison with run-off from even a minor rainstorm, although minor revisions to surface drainage facilities may be necessary to prevent unsightly or undesirable accumulations.

There are no current provisions for wastewater collection, treatment or disposal on a nationwide basis. While knowledgeable officials recognize this problem must be addressed in the future, there are no formal plans to meet the requirement at present. If left unattended and unresolved, unsatisfactory disposal of wastewater could present an additional hazard to public health, and could conceivably produce an adverse visual effect on the environment. The potable water system will not be in danger of contamination from the wastewater since, assuming proper installation and operation of the new improved distribution systems, the water supply will be under sufficient constant pressure to prevent infiltration. In fact, the incidence of waterborne diseases should decline since many present water systems are subject to contamination by infiltration owing to occasional negative pressures on distribution systems.

In the Philippines, wastewater has not been given the significance or priority it enjoys in more developed countries. In the contemplation and order of priorities, local decision makers consider basic water supply and distribution to be far more important than sewage disposal and at this point are simply unwilling to consider investing an equal amount, and possibly more, of capital funds in sewerage as in water-works improvements. In the highly urbanized coastal areas* such as Manila, Cebu and Zamboanga, the order of priority appears to be water supply, drainage/flood control and then wastewater disposal.

Before planning the implementation of drainage and/or wastewater facilities, a policy decision must be made on whether the works should be designed on the basis of separate piping for surface run-off (storm) and (sanitary) wastewater, or of a combined system. This can only be accomplished through a feasibility study. It is, therefore, essential that sewerage feasibility studies be conducted as expeditiously as possible after the initial phase of water supply implementation is underway.

Environmental Effects of an Impoundment

The construction of a water supply impoundment will have positive and negative impacts on the environment. Evaluation of these impacts on the environment indicates a net environmental benefit.

Positive Impacts. A water supply impoundment will provide safe, adequate and economical water supply to an urban area. The alternative to this impoundment/transmission/treatment scheme is brackish water treatment of pumped groundwater in the specific case of Metropolitan Cebu. Besides being over four times more expensive, the brackish water treatment scheme involves very high energy use.

*In the Philippines, only Manila and Zamboanga have some form of wastewater disposal system. At present Manila is basically served by an antiquated sewage disposal system designed to serve 220,000 (Metro Manila is now about 4.9 million in population). Practically all other liquid wastewater is transported to natural drainage systems through open ditches, gutters, canals, etc. Yet there is no evidence of intolerable or unacceptable public health conditions as a result. Zamboanga has a system which was built in 1913 and has had no significant improvements since then. It serves about 20 per cent of the core city area.

The lake or impoundment created behind the dam will provide a scenic and aesthetic asset to the community. This lake will attract tourists to view the waterscape which would have then replaced the currently denuded and eroding hillsides.

Reservoir storage, if properly operated, will also reduce the destructive effect of flash floods in areas downstream of the dam.

Negative Impacts. The impoundment will:

1. increase the loss of water due to evaporation;
2. change the habitat of any wildlife and other fauna;
3. serve as a nutrient trap, holding nutrients which otherwise would have moved downstream.
4. need to relocate people/homes from the watershed.

Loss of water from evaporation is a relatively minor impact since water in the uncontrolled rivers eventually gets lost to the seas.

While inundation means a loss of some non-aquatic species, the reservoir will provide a new habitat for waterfowl and other lake-oriented species.

Nutrients "trapped" in the impoundment may accelerate eutrophication within the lake, stimulating the growth of algae and aquatic weeds.

With careful consideration during final design, these negative impacts of the project can be significantly reduced.

Increase in Migration to Urban Areas

In the Philippines, migration from rural to urban areas is inescapable. Rural migrants seeking new economic opportunities usually have two distinct choices of destination: the Metropolitan Manila and the other urban areas. Being the most favored migration point, Metropolitan Manila, however, has reached a level when present government policies incline towards migration restraint. In the meanwhile, other urban areas of high growth potential await further development.

Metropolitan Manila is troubled with "people" congestion, "traffic" congestion, lack of housing, environmental problems (water and air pollution), unemployment, slums, poor quality of life, etc. For these reasons, plans for regional development in selective urban areas and growth centers such as Batangas, Dagupan, Baguio, Tuguegarao, Legaspi, Iloilo, Cebu, Butuan and Davao (in the order of distance from Metropolitan Manila) are currently being discussed.

The regional development plan offers an opportunity to minimize population density in already congested areas. It helps avoid overcrowding that clearly has been detrimental to the health, safety and welfare of the residents. It intends to maintain a balance between quality of life and city living. Such development plan intends to intercept rural migration to Metro Manila and redirect this to the various regional development centers.

Infrastructure projects including water supply projects are strong stimuli to urban growth. It is usually admitted that a potable water supply is a necessary condition for economic growth and development of an urban area. Infrastructure projects such as public housing, roads, communications, markets, etc., become more beneficial when an adequate water supply project accompanies such investments.

Therefore, the provision of the water supply projects to selected and dispersed urban areas in the Philippines will assist:

- (1) in the current policy of discouraging migration into Metro Manila;
- (2) in enhancing in a meaningful way the various regional development centers throughout the Philippines.

C. IRREVERSIBLE COMMITMENT OF RESOURCES

The primary impact of the recommended plan on natural resources is the use of chlorine, power and fuel during the operating phase, and the use of materials, foreign exchange, etc., during the construction phase. The labor time for construction and operation is also a natural resource. However, in view of high unemployment in the project area, the use of this resource has a beneficial impact.

Secondary resource commitment occurs as a consequence of new development encouraged by expansion of the water supply system. As the population continues to increase, areas of land will be irreversibly committed to residential, commercial, and industrial uses. Well-developed and successful land use planning will minimize the loss of open space and related natural biota.

D. BENEFITS OF THE PROPOSED ACTION

Health Benefits

The establishment of a water supply system in a community will necessarily bring about health benefits to the population. Undoubtedly, the provision of safe, potable water to the population is a prerequisite for the maintenance of minimum health standards. These health benefits are ordinarily manifested in the following:

1. A significant reduction in the incidence of waterborne diseases such as cholera, dysentery, gastro-enteritis, and typhoid/paratyphoid. As a result, there will be a decrease in the amount of time lost by income earners who are afflicted with such diseases.
2. A subsequent reduction in premature deaths due to the lower incidence of waterborne diseases.
3. A corresponding reduction in medical expenses due to lower incidence of waterborne diseases.

Other Benefits

The water supply project will generate other benefits as shown in the following table. This table indicates the implication of having (with) or not having (without) the water supply project.

| <u>Hypothesis</u> | <u>" Without" Project</u> | <u>" With" Project</u> |
|-------------------|---|---|
| Water Adequacy | will continue to become in short supply; service will be intermittent and unreliable. | supply will be adequate at continuous pressure. |

| <u>Hypothesis</u> | <u>"Without" Project</u> | <u>"With" Project</u> |
|--|---|--|
| 2. Water Quality | will continue to provide unsafe water and water-borne diseases will continuously be a threat. | supply will be safe, wholesome and healthful. |
| 3. Personal Hygiene of Served Population | because of current water shortage, personal cleanliness is expected to range from marginal to lacking. | will enhance personal hygiene and overall appearance and cleanliness of the population. |
| 4. Personal Satisfaction | will be minimal; significant time spent in fetching water. | releases time for other productive activities' provides "modernization" benefits; enhances self-reliance. |
| 5. Employment Benefits | no improvement. | will provide short and long-term employment benefits. |
| 6. Fire Protection and Fire Insurance | no improvement; area vulnerable to extensive fire damage because of water shortage; no reduction in insurance because the level of fire risks will remain essentially the same. | will improve the fire-fighting capabilities of the area; reduction in fire insurance cost since availability of water with adequate pressure will reduce fire risks. |
| 7. Water-Using Industries in Area | no inducement to industries which use water as a primary or secondary input to locate in the area. | water-using industries will be encouraged to expand facilities, or relocate in the area. |
| 8. Local Tourism | non-availability of piped potable water and poor sanitation facilities will be a deterrent to local tourism. | availability of water, if accompanied by sanitation program, will help boost local tourism. |

| <u>Hypothesis</u> | <u>"Without" Project</u> | <u>"With" Project</u> |
|--|--|--|
| 9. Development of Areas Adjacent to Core City Area into Housing Subdivisions | no impetus to the development of areas adjacent to core city since not much economic activity can occur without adequate water supply. | will help spur the development of areas adjacent to core city into housing subdivisions because water supply availability somehow enhances standard of living. |
| 10. Wastage of Water - a Valuable Natural Resource | wasteful consumption of water will continue because of the absence of safeguards to check its use. | undertaking of metering program and adoption of new realistic water rates will definitely minimize water wastage. |
| 11. Land Values | market value of land will remain at present levels except for effect of inflation. | will increase land values by at least 10 percent since water availability is a major consideration in market values of land. |

E. ALTERNATIVES TO THE PROPOSED ACTION

Alternatives to the proposed (conventional) water supply project consist of the following: desalting of sea or brackish water, wastewater reuse and dual plumbing. These are discussed below.

Desalting

Desalting is the process of converting seawater into fresh water. It involves removing substantial amounts of the ocean's salts and minerals.

There are three basic methods of desalting: distillation, freezing and electrodialysis, each with several variations.

Over 90 per cent of the present application of desalting is done by distillation. In this process, seawater is evaporated and the vapor is condensed. Salt deposits form on the surfaces of the evaporating

equipment and the desalinated water is the resulting distillate. The least costly distillation unit uses solar energy as heat source.

Electrodialysis obtains fresh water by using an electric current to separate the ions of the contaminating salts. In the process of freezing, ice is formed from a saline solution and is melted to produce fresh water. The melted ice, however, sometimes has a salty taste.

In 1970, 33 small-sized desalting plants were put to operation throughout the world, with a combined capacity of 59.7 mgd. Kuwait has the largest plant with a 30 mgd capacity sufficient to supply a population of 150,000. Other plants are found in Netherlands, United States, Venezuela and Aruba.

For the most part, desalting is still experimental. At present it is not technically and economically feasible to convert meaningful amounts of seawater into fresh water. All the processes have inherent defects for general use, including the problem of disposing about 50 per cent of removed salts and minerals of the total treated seawater.

These processes are also costly because they involve significant quantities of energy. Whereas treatment of ordinary water supply costs about 5 cents per 1,000 gallons of fresh water, desalting costs about \$1.00 per 1,000 gallons of desalted water. This cost covers only the plant itself and excludes necessary transmission facilities. (Also these costs are pre-energy crisis costs.)

Economic factors cannot be ignored if desalting is to be considered for application in the Philippines. Existing conditions, especially the continual inflationary effect of the worldwide oil crisis and technological limitations, do not allow the immediate use of desalting to augment water supply in the Philippines. Until a technological breakthrough occurs which will require the minimal use of energy, desalting appears to be economically impractical at present.

Wastewater Reuse

One of the potential alternatives in meeting future water demand is the reuse or recycling of wastewater (sewage). In Singapore, reclaimed wastewater is used in the industrial cooling process. A full-scale municipal reuse facility in Windhoek in Southwest Africa built in 1969 provides a major source of potable water.

Reuse of wastewater can be accomplished in two ways: by natural self-purification which makes reuse possible for irrigation and recharging of ground and surface waters, and by technological process. The technology of reuse involves treatment of used water supplies from the community for domestic, industrial, irrigation and other purposes.

Complex treatment processes are necessary to remove the objectionable characteristics of wastewater and make it suitable for a particular use. There are three basic phases of treatment - primary, secondary and advanced. One of these or all may be applied depending on the types of use and pollutants present in the wastewater.

Studies on wastewater reclamation deal with enhancing its economic feasibility for large scale use and technological expansion. Achieving these objectives will depend on several factors.

It is technologically possible to produce water of any desired quality from any source. However, the controlling factor is economics. Because of its lesser solids content, wastewater reclamation, for instance, is simpler than seawater desalting as an alternative source of supply.

The feasibility of wastewater reclamation as a source of water supply will be limited since wastewater volumes are currently minimal, with future increases in sewage expected to be slow.

Existing wastewater treatment technology is currently applicable for purposes other than potable drinking water use. Drinking water standards have not been designed to apply to recycled wastewater and for this liquid, no potable water standards have been established yet. Even by advanced treatment, certain toxic elements in the wastewater remain. The techniques are not yet fully developed to treat adequately certain objectionable characteristics of wastewater.

The advanced wastewater treatment plant is not simple to operate. Moreover, the problem of treatment is accompanied by another technological problem - disposing the significant quantities of solid matter removed from the treated wastewater.

The wide application of wastewater reuse in the future will depend heavily on technological progress and on public acceptance, in the case of using recycled wastewater for drinking.

Any future consideration of wastewater reuse for municipal water supply will require thorough studies. The present and near future condition of minimal sewer collection facilities (and therefore minimal wastewater) in the Philippines precludes the possibility of harnessing wastewater as a major source of water supply.

Dual Plumbing System

A relatively small increment of the total public water supply demands highly potable and clean water such as that required for drinking, cooling, bathing and washing clothes. It is possible for instance to use sea water for toilet flushing, washing streets, fire-fighting. Where fresh potable water is in short supply, such as in Singapore and Hongkong, a dual system has demonstrated its efficacy. For example, in Hongkong during the severe drought of summer 1963, water service was rationed into the various city sectors 4 hours every 4 days. Extraneous uses of water such as toilet flushing were therefore severely curtailed. In some of the highrise government housing in Hongkong, dual plumbing system has been used, with sea water for toilet flushing.

There are two main objections that have been identified in the use of dual system - cross-connections and associated cost. The dual water supply system where one system delivers potable water and the other system furnishes untreated water can very well lead to serious waterborne disease outbreaks. Where proposed, the dual water supply system should have the non-potable supply clearly indicated and separated from the potable supply. Proper plumbing codes and supervision of plumbing installation could minimize this health hazard.

If an existing system is to be replaced entirely by a dual system the cost may well be unreasonable. However, if the existing water supply piping is retained for potable (drinking) system and a new non-potable pipe network utilizing sea water is added, there is a possibility that the economics may prove the dual system to be worthwhile. Savings accrue where the non-potable system serves high-rise multi-family dwelling units with high density. The increased cost resulting from the independent system may be offset by eliminating the need for developing

new water resources and above all retaining high quality premium water for domestic consumption. Accordingly, the feasibility of the dual system has already been proven. Because the potable water system will not be used for fire protection, its distribution system need not be designed for high pressures that otherwise are required in a system which has a high fire demand. However, because most existing pipe systems have very marginal useful life remaining, the economics will most likely mitigate against a dual system.

Conclusion

The above stated alternatives are likely to be economically less favorable than the proposed conventional water supply project.

Wastewater reuse and dual plumbing have significant health hazards when compared with the proposed project.

Desalting may eliminate impoundments and long transmission lines thereby lessening the adverse effects such as erosion and noise, and on aesthetics. However, desalting will consume unusually large quantities of power and energy.

In all cases, wastewater will be generated and handling facilities will still be required (except for the wastewater reuse alternative). Resources will still be committed such as land, power, fuel and human resources.

From the overall (economics, health, and technology) viewpoint, the proposed water supply project is still the most reliable and economical solution to the water supply needs of these communities.

F. SUMMARY

The probable environmental effects are summarized in table form below:

SUMMARY TABLE
PROBABLE ENVIRONMENTAL EFFECTS

| <u>I t e m</u> | <u>Term</u> | <u>Positive</u> | <u>Negative</u> | <u>Solution</u> |
|----------------|-------------|-----------------|-----------------|--------------------------|
| Soil Erosion | Short | | | tight construction specs |
| Dust | Short | | | "do" |

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project: From FY 1977 to FY 1981
Total U.S. Funding: \$20,000,000
Date Prepared: March 1, 1976

Project Title & Number: Provincial Water II 492-0263

(INSTRUCTION: THIS IS AN OPTIONAL FORM WHICH CAN BE USED AS AN AID TO ORGANIZING DATA FOR THE PAR REPORT. IT NEED NOT BE RETAINED OR SUBMITTED.)

PAGE 1

| NARRATIVE SUMMARY | OBJECTIVELY VERIFIABLE INDICATORS | MEANS OF VERIFICATION | IMPORTANT ASSUMPTIONS |
|---|--|---|--|
| <p>Program or Sector Goal: The broader objective to which this project contributes: (A-1)</p> <p>To improve the health and economic welfare of the provincial poor.</p> | <p>Measures of Goal Achievement: (A-2)</p> <p>DOH statistics show 20% drop in water related diseases by 1985 in target cities.</p> <p>10% increase in real per capita income in target cities by 1985.</p> | <p>(A-3)</p> <p>DOH records/statistics.</p> <p>NEDA records</p> | <p>Assumptions for achieving goal targets: (A-4)</p> <ol style="list-style-type: none"> 1) Absence of extreme negative variations in the national economy - sustained 4-6% annual GNP growth. 2) Reduction in national birth rate. 3) Increased acceptance of improved nutritional practices. |

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project: _____
From FY _____ to FY _____
Total U.S. Funding _____
Date Prepared: _____

Project Title & Number: _____

PAGE 2

| NARRATIVE SUMMARY | OBJECTIVELY VERIFIABLE INDICATORS | MEANS OF VERIFICATION | IMPORTANT ASSUMPTIONS |
|--|---|---|---|
| <p>Project Purpose: (B-1)</p> <p>1) Increase the use of safe, reliable and economic sources of water in the targeted areas - with particular reference to the lower income group.</p> <p>2) Institutional Development of LWUA and local water districts.</p> <p>3) Contribute to economic development in the targeted areas.</p> | <p>Conditions that will indicate purpose has been achieved: End-of-Project status. (B-2)</p> <p>1) a. Safe water supply available for additional 1.5 people in target areas by 1981. b. DOH statistics show 20% decline in incidence of waterborne diseases in target areas by 1985.</p> <p>2) LWUA planning, implementing/managing and evaluating local water projects and systems without technical assistance by 1981. a. Local water projects and systems without technical assistance by 1981. b. Local water districts efficiently managing systems.</p> <p>3) 10% increase in industrial and commercial activity in service areas by 1985.</p> | <p>(B-3)</p> <p>1) Records of LWUA and local water districts</p> <p>2) Provincial Department of Health Statistics</p> <p>3) USAID evaluation</p> <p>4) Independent surveys</p> <p>5) Provincial economic office records on business and employment.</p> | <p>Assumptions for achieving purpose: (B-4)</p> <p>1) Cost of house connections will not exceed potential users ability to pay.</p> <p>2) Current incomes will remain stable or increase.</p> <p>3) As income increases, the propensity for house connections increases.</p> <p>4) A good waterworks system contributes to community economic development.</p> <p>5) Community standpipes will be made available.</p> |

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project: _____
From FY _____ to FY _____
Total U.S. Funding _____
Date Prepared: _____

Project Title & Number: _____

| NARRATIVE SUMMARY | OBJECTIVELY VERIFIABLE INDICATORS | MEANS OF VERIFICATION | IMPORTANT ASSUMPTIONS |
|---|--|---|---|
| <p>Project Outputs: (C-1)</p> <ol style="list-style-type: none"> 1) Construction/improvement of waterworks systems. 2) Trained LWUA personnel. 3) Water Analysis Laboratory. 4) Waterworks Training Laboratory. | <p>Magnitude of Outputs: (C-2)</p> <ol style="list-style-type: none"> 1) 25-35 high impact systems. 2) 25-30 waterworks design engineers. 3) Fully equipped and operating laboratory. 4) Waterworks training facilities. | <p>(C-3)</p> <ol style="list-style-type: none"> 1) Project completion reports. 2) Loan Fund disbursement records. 3) LWUA records. 4) Waterworks training facilities. | <p>Assumptions for achieving outputs: (C-4)</p> <ol style="list-style-type: none"> 1) There will be a continuing and expanding demand for LWUA's services to local water districts. 2) Capable people can be hired and LWUA will be provided adequate budget support. |

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project: _____
From FY _____ to FY _____
Total U.S. Funding _____
Date Prepared: _____

Project Title & Number: _____

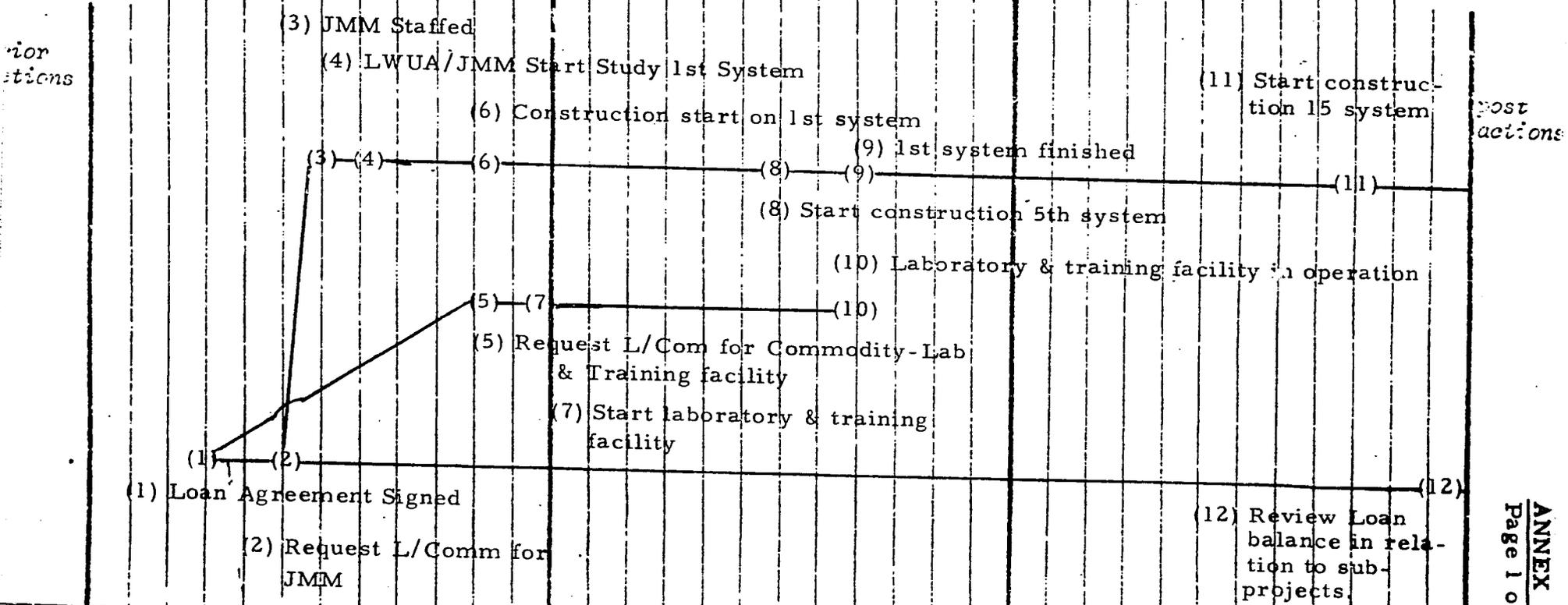
| NARRATIVE SUMMARY | OBJECTIVELY VERIFIABLE INDICATORS | | MEANS OF VERIFICATION | IMPORTANT ASSUMPTIONS | | | | | | | | | |
|---|---|--------------|-----------------------|---|-----------|----------|--------|--------------|--------|--------------|--------|--|---|
| Project Inputs: (D-1) | Implementation Target (Type and Quantity) (D-2) | | (D-3) | Assumptions for providing inputs: (D-4) | | | | | | | | | |
| <p><u>AID - Loan</u></p> <ol style="list-style-type: none"> 1) Construction and equipment 2) Consulting Services 3) Commodities 4) Participant training <p><u>GOP</u></p> <ol style="list-style-type: none"> 1) Loan or Grant funding of LWUA. 2) LWUA Personnel. | <p><u>AID</u></p> <table border="0"> <tr> <td style="text-align: center;"><u>FY 76</u></td> <td style="text-align: center;"><u>FY 77</u></td> </tr> <tr> <td>1) \$6.8</td> <td>1) \$10.0</td> </tr> <tr> <td>2) \$3.0</td> <td>2) -0-</td> </tr> <tr> <td>3) \$100,000</td> <td>3) -0-</td> </tr> <tr> <td>4) \$100,000</td> <td>4) -0-</td> </tr> </table> | <u>FY 76</u> | <u>FY 77</u> | 1) \$6.8 | 1) \$10.0 | 2) \$3.0 | 2) -0- | 3) \$100,000 | 3) -0- | 4) \$100,000 | 4) -0- | <ol style="list-style-type: none"> 1) Loan authorization. 2) Contract with consultant for engineering and design training. | <ol style="list-style-type: none"> 1) US Loan funds and GOP local currency available. 2) US consultant contracted. 3) Sufficient local construction firms available. |
| <u>FY 76</u> | <u>FY 77</u> | | | | | | | | | | | | |
| 1) \$6.8 | 1) \$10.0 | | | | | | | | | | | | |
| 2) \$3.0 | 2) -0- | | | | | | | | | | | | |
| 3) \$100,000 | 3) -0- | | | | | | | | | | | | |
| 4) \$100,000 | 4) -0- | | | | | | | | | | | | |

PROJECT PERFORMANCE TRACKING (PPT) SYSTEM

| | | | | |
|-------------------------|-------------|---------------------------------------|--------------------|----------|
| country: Philippines | project no: | project title: Provincial Water II | date: / / original | FFI copy |
| | | | / / revision# | |

or FY: CY month: Apr May Jun Jul Aug Sep Oct '76 Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct '77 Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct '78 Nov Dec Jan Feb Mar

0 12 24 36



financial plan:
evaluation plan:

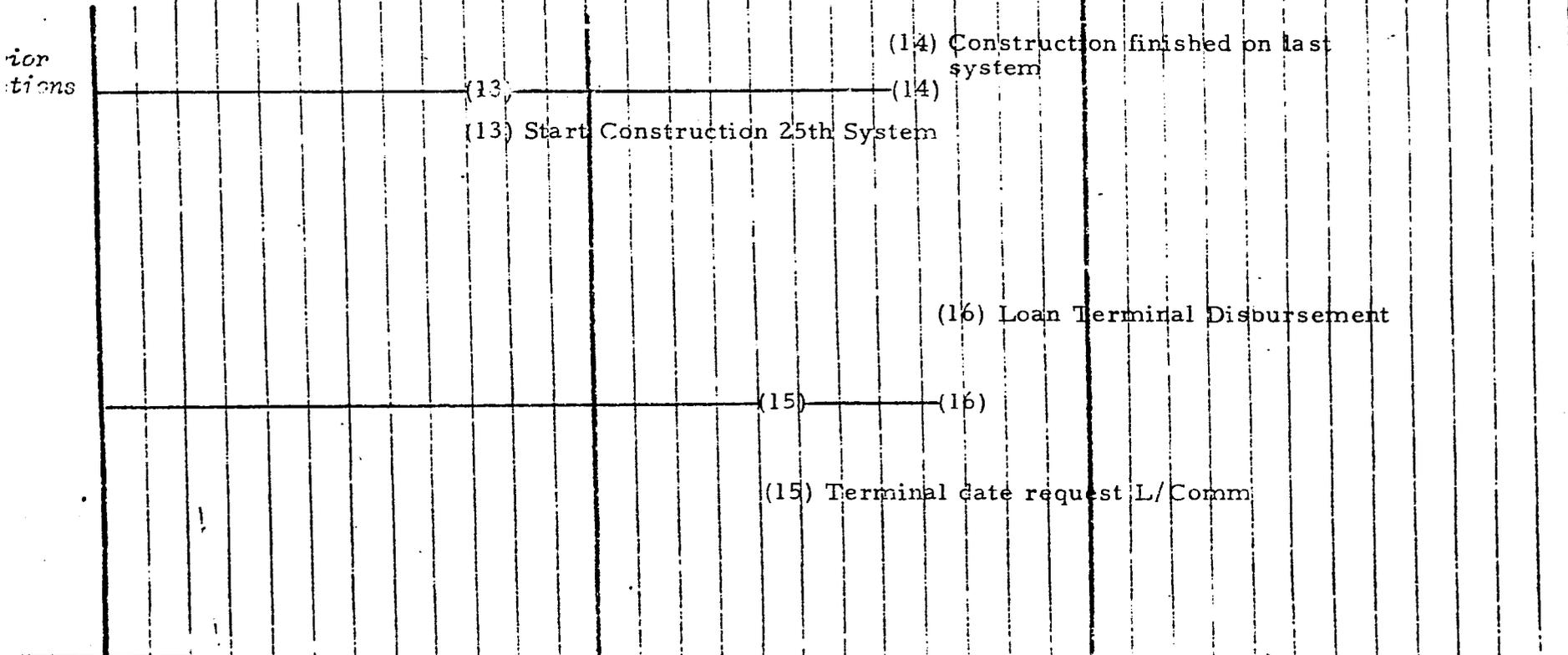
PROJECT PERFORMANCE TRACKING (PPT) SYSTEM

| | | | | |
|----------|--------------|----------------|--------------------|----------|
| country: | project no.: | project title: | date: / / original | PFI appr |
| | | | / / revision# | |

or FY:
CY

| | | | | | | | | | | | | | | | | | | | | |
|--------|-----|-----|---------|-----|-----|-----|---------|--|--|--|--|--|--|--|--|--|--|--|--|--|
| month: | Apr | Jul | Oct '79 | Jan | Apr | Jul | Oct '80 | | | | | | | | | | | | | |
| | May | Aug | Nov | Feb | May | Aug | Nov | | | | | | | | | | | | | |
| | Jun | Sep | Dec | Mar | Jun | Sep | Dec | | | | | | | | | | | | | |

0 12 24 36



post actions

financial plan:
evaluation plan:

CRITICAL PERFORMANCE INDICATOR (CPI) NETWORK

PROJECT PERFORMANCE TRACKING (PPT) SYSTEM

| | | | | | |
|----------|-------------|----------------|-------|----------------|-----------|
| country: | project no: | project title: | date: | / / original | approved: |
| | | | | / / revision # | |

CPI DESCRIPTION

Prior Action

LWUA/JMM Contract
"110 System Study"

| | | |
|--|-------------|-------|
| 1) Loan Agreement Signed | June 30 '76 | GOP |
| 2) Request L/Comm for JMM | Aug 30 '76 | LWUA |
| 3) JMM Staffed | Sept 30 '76 | JMM |
| 4) LWUA/JMM Start Study 1st System | Oct 30 '76 | LWUA |
| 5) Request L/Com for Commodities (Laboratory) | Feb 15 '76 | LWUA |
| 6) Construction Start on 1st System | Mar 1 '77 | LWUA |
| 7) Start Laboratory & Training Facility | Mar 30 '77 | LWUA |
| 8) Construction start on 5th system | Sept 30 '77 | LWUA |
| 9) 1st System Finished | Nov 30 '77 | LWUA |
| 10) Laboratory & Training Facility in Operation | Dec 1 '77 | LWUA |
| 11) Construction start on 15th system | Dec 30 '78 | LWUA |
| 12) LWUA/JMM/USAID Review balance in relation to subprojects | Mar 31 '79 | USAID |
| 13) Construction start on 25th systems | Dec 30 '79 | LWUA |
| 14) Construction finished on last system. | Nov 30 '80 | LWUA |
| 15) Terminal date for requesting L/Com | July 30 '80 | |
| 16) Terminal date Disbursement | Dec 30 '80 | |

CHECKLIST OF STATUTORY CRITERIA

FAA - Foreign Assistance Act of 1961, as amended.

FAA, 1973 - Foreign Assistance Act of 1973

App. - Foreign Assistance and Related Programs Appropriation Act, 1974.

MMA - Merchant Marine Act of 1936, as amended.

BASIC AUTHORITY

- | | |
|--|--|
| 1. FAA 103; 104; 105; 106; 107. Is loan being made | (a) While this loan will not directly alleviate starvation, hunger and malnutrition; it will provide a very basic need of safe water to poor people, thereby, reducing diarrhea which should increase caloric ingestion. The loan will result in some reduction of waterborne diseases in the Philippines. |
| a. for agriculture, rural development or nutrition; | (b) This loan will have no effect on family planning but will directly combat and prevent waterborne diseases. |
| b. for population planning or health; | (c) Not applicable. |
| c. for education, public administration, or human resources development; | (d) This loan should assist economic development by making safe reliable water available to commercial/industrial development in provincial-urban areas. |
| d. to solve economic and social development problems in fields such as transportation, power, industry, urban development, and export development; | (e) Not applicable. |
| e. in support of the general economy of the recipient country or for development programs conducted by private or international organizations. | |

COUNTRY PERFORMANCE

Progress Towards Country Goals

2. FAA 201 (b) (5), (7) & (8); 208

A. Describe extent to which country is:

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

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

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

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

(b) Diverting such resources for unnecessary military expenditure (See also Item No. 19) and intervention in affairs of other free and independent nations.) (See also Item No. 10.)

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

(1) Food production is top priority of the Philippine Government with the goal of achieving self-sufficiency in rice and corn and accelerated production of livestock, poultry, fish, fruits and vegetables. Plans for expanded warehousing and distributions of the increased output of grains are being prepared and carried out with help from IBRD loan. Also, through other AID loans assistance, (i. e. in small scale irrigation and agricultural research) the GOP goals should be reached in the near future.

(2) See FAA 620(e) (1), Item 4, below.

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

Additionally, in an attempt to redistribute income and raise the rural standard of living, the GOP has recently embarked upon an aggressive land reform program. The GOP is well under way with a country-wide rural electrification program thereby increasing the role of the public through participation in local cooperatives.

(4) (a) About two-thirds of the national budget is allocated to social and economic development. About 10 percent of the budget goes to education, more than 13 percent to agriculture and natural resources, and 16 percent to transportation and communications.

(b) Less than 17 percent of the budget goes to National Defense.

(5) Since its establishment as an independent nation in 1946, the Philippines traditionally has adopted the basic principles of having a free and open society. On Sept. 22, 1972, President Marcos, citing a serious threat to their system from both the extreme left and right, invoked martial law, and ruling by decree, ordered an accelerated implementation of essential reforms long needed to improve the effectiveness of the government and its to the needs of the people, to reduce widespread crime and corruption, to speed development efforts aimed primarily at improving the social and economic well-being of lower income groups. In this regard President Marcos is inaugurating an all-encompassing nationwide land reform program. However, under Martial Law political activity and freedom of the press has been curtailed. Over the last five years the GOP has increased revenues through improved administration and new tax laws.

Over the period of the Project, the GOP will be providing a total of ₱19,600,000 toward this project.

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

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

(6) GOP will provide a minimum of 50% of currency required.

(7) Over the past six years the Philippines government has placed increasing emphasis on rural development in an effort to narrow the gap between the rich and the poor, to increase employment opportunities, raise the income levels of the rural population, and to improve the standard of living. Heavy investments are being made on Rural Electrification, transportation, irrigation, agrarian reform, farmer support services, agriculture production, nutrition, and education. Greatly increased external assistance from various bilateral and international donors over the past four years has been directed almost entirely to the rural sector.

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

B. Yes.

Treatment of U. S. Citizens and Firms.

- | | |
|--|--------|
| 3. FAA 620 (c). If assistance is to government, is the government liable as debtor or unconditional guarantor on any debt to a U. S. citizen for goods or services furnished or ordered where (a) such citizen has exhausted available remedies and (b) debt is not denied or contested by such government? | 3. No |
| 4. FAA 620 (e) (1). If assistance is to a government, has it (including government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U. S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities? | 4. No. |

5. FAA 620 (o); Fishermen's Protective Act. 5. If country has seized, or imposed any penalty or sanction against, any U. S. fishing vessel on account of its fishing activities in international waters,
5. There has been no such seizure.
- a. has any deduction required by Fishermen's Protective Act been made? NA
- b. has complete denial of assistance been considered by A. I. D. Administrator? NA

Relations with U. S. Government and Other Nations

6. FAA 620 (a). Does recipient country furnish assistance to Cuba or fail to take appropriate steps to prevent ships or aircraft under its flag from carrying cargoes to or from Cuba? 6. No.
7. FAA 620 (b). If assistance is to a government, has the Secretary of State determined that it is not controlled by the international Communist movement? 7. Yes.
8. FAA 620 (d). If assistance is for any productive enterprise which will compete in the United States with United States enterprise, is there an agreement by the recipient country to prevent export to the United States of more than 20% of the enterprise's annual production during the life of the loan? 8. This assistance is not for such a productive enterprise.
9. FAA 620 (f). Is recipient country a Communist country? 9. No.
10. FAA 620 (i). Is recipient country in any way involved in (a) subversion of, or military aggression against, the United States or any country receiving U. S. assistance, or (b) the planning of such subversion or aggression? 10. No.

11. FAA 620 (j). Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction, by mob action, of U.S. property?
11. The GOP has taken all reasonable measures to protect U.S. property. On infrequent occasions, when damage has occurred, proper compensation has been made without delay.
12. FAA 620 (l). If the country has failed to institute the investment guaranty program for the specific risks of expropriation, in convertibility or confiscation, has the A.I.D. administration within the past year considered denying assistance to such government for this reason?
12. The Philippines has instituted an investment guaranty program with the full range of risk coverage.
13. FAA 620 (n). Does recipient country furnish goods to North Viet-Nam or permit ships or aircraft under its flag to carry cargoes to or from North Viet-Nam?
13. No.
14. FAA 620 (q). Is the government of the recipient country in default on interest or principal of any A.I.D. loan to the country?
14. No.
15. FAA 620 (t). Has the country severed diplomatic relations with the United States? If so, have they been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption?
15. There has been no such severance.
16. FAA 620 (u). What is the payment status of the country's U.S. obligations? If the country is in arrears, were such arrearages taken into account by the A.I.D. Administrator in determining the current A.I.D. Operational Year Budget?
16. The Philippines is not in default with respect to its dues, assessments or other obligations to the U.N.

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

17. No.

18. FAA s 659. If (a) military base is located in recipient country, and was constructed or is being maintained or operated with funds furnished by U. S. and (b) U. S. personnel carry out military operations from such base, has the President determined that the government of recipient country has authorized regular access to U. S. correspondents to such base?

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

Military Expenditures

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

19. Annual defense budgets average less than 17% of the national budget. Approximately one-third of this amount is for maintenance of peace and order. Philippine foreign exchange resources used to acquire military equipment are negligible. We know of no diversion of either development assistance or PL 480 sales to military expenditures. We are not aware of any diversion of Philippine resources for unnecessary military expenditures.

Conditions of the Loan

General Soundness

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

20. Interest on this loan will be 2 percent during the 10 year grace period and 3 percent for the 30 years

of lending and relending terms of the loan.

remaining to maturity. These terms are reasonable and are not higher than the applicable legal rate of interest under Philippine law.

21. FAA s 201 (b) (2); s 201 (e)

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

21. Each subproject financed under this loan must be justified individually. The GOP has submitted such an application to A. I. D. See Annex H.

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

22. The current and expected ratio between debt repayment and foreign exchange earnings of the Philippines is expected to be adequate. There are reasonable prospects of repayment.

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

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

24. FAA s 611 (a) (1). Prior to signing of loan will there be (a) engineering, financial, and other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the United States of the assistance?

24. (a) Yes. Detailed plans and estimates will be required by the Loan Agreement before starting construction of any individual system. A prefeasibility study has been completed which establishes firm cost data and design criteria for each subproject.

(b) Firm costs of the U. S. assistance will be established using modified Fixed Amount Reimbursement procedures.

25. FAA s 611 (a) (2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of loan?

25. All legislative authorities exist.

26. FAA s 611 (e). If loan is for Capital Assistance, and all U. S. assistance to project now exceeds \$1 million, has Mission Director certified the country's capability effectively to maintain and utilize the project?

26. Yes. See Annex .

Loan's Relationship to Achievement of Country and Regional Goals

27. FAA s 207; s 113

Extent to which assistance reflects appropriate emphasis on; (a) encouraging development of democratic, economic, political, and social institutions; (b) self-help in meeting the country's food needs; (c) improving availability of trained manpower in the country; (d) programs designed to meet the country's health needs; (e) other important areas of economic, political, and social development, including industry; free labor unions, cooperatives, and Voluntary Agencies; transportation and communication; planning and public administration; urban development, and modernization of existing laws; or (f) integrating women into the recipient country's national economy.

27. (a) This project directly contributes to the formation of locally independent water districts, (b) Not applicable (c) greatly contributes to training manpower in area of public health and engineering, (d) will make a significant impact on public health re waterborne disease, (e) will contribute towards urban development, (f) women as definitely part of this program, sanitary and civil engineering are fields in which women participate in the Philippines.

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

28. No.

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

29. See relationships of this project to other activities in area of public health, Annex K .

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

30. Under this project self-supporting independent water districts will be formed.

31. FA 209; Information and conclusion whether assistance will encourage regional development programs.
31. Not applicable.
32. FAA s 111. Discuss the extent to which the loan will strengthen the participation of urban and rural poor in their country's development, and will assist in the development of cooperatives which will enable and encourage greater numbers of poor people to help themselves toward a better life.
32. This project makes a direct contribution towards involving the urban poor in the water district economic development.
33. FAA s 201 (f). If this is a project loan, describe how such project will promote the country's economic development taking into account the country's human and material resources requirements and relationship between ultimate objectives of the project and overall economic development.
33. By effecting a decrease in water-borne disease, this project promotes the country's overall economic development.
34. FAA s 281 (a). Describe extent to which the loan will contribute to the objective of assuring maximum participation in the task of economic development on the part of the people of the country, through the encouragement of democratic, private and local governmental institutions.
34. The independent water districts formed under this project require active participation of the people of the area.
35. FAA s 281 (b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civic education and training in skills required for effective participation in governmental and political processes essential to self-government.
35. See #34 above.

36. FA 201 (b) (3). In what ways does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of productive capacities?
37. FAA 601 (a). Information and conclusions whether loan will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions.
38. FAA 619. If assistance is for newly independent country, is it furnished through multilateral organizations or plans to the maximum extent appropriate?
36. This project by reducing the incident of waterborne diseases will contribute to the development of economic resources by reducing illness and thus lost time.
37. No direct effect except for the reduction of illness.
38. The Philippines is not a newly independent country.

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

39. FAA 201 (b) (6). Information and conclusion on possible effects of loan on U. S. economy, with special reference to areas of substantial labor surplus, and extent to which U. S. commodities and assistance are furnished in a manner consistent with improving the U. S. balance of payments position.
40. FAA 202 (a). Total amount of money under loan which is going directly to private enterprise, is going to intermediate credit institutions or other borrowers for use by private enterprise, is being used to finance imports from private sources, or is otherwise being used to finance procurements from private sources.
39. Although firms from Code 941 countries will be eligible to compete on this Project, past experience with larger water system improvements in the Philippines indicates that U. S. firms will supply some of the mechanical and electrical equipment while Philippine contractors do the construction work.
40. The total loan amount will go to private enterprise.

41. FAA 601 (b). Information and conclusion on how the loan will encourage U. S. private trade and investment abroad and how it will encourage private U. S. participation in foreign assistance programs (including use of private trade channels and the services of U. S. private enterprise).
41. Procurement of mechanical and electrical equipment will be open to firms in Code 941 countries. U. S. firms traditionally have supplied most of this equipment under previous loan.
42. FAA 601 (d). If a capital project, are engineering and professional services of U. S. firms and their affiliates used to the maximum extent consistent with the national interest?
42. Yes.
43. FAA 602. Information and conclusion whether U. S. small business will participate equitably in the furnishing of goods and service financed by the loan.
43. AID procurement procedures will be followed.
44. FAA 620 (h). Will the loan promote or assist the foreign aid projects or activities of the Communist-Bloc countries?
44. No. The loan agreement will contain implementation control prohibiting such use.
45. FAA 621. If Technical Assistance is financed by the loan, information and conclusion whether such assistance will be furnished to the fullest extent practicable as goods and professional and other services from private enterprise on a contract basis. If the facilities of other Federal agencies will be utilized, information and conclusion on whether they are particularly suitable, are not competitive with private enterprise, and can be made available without undue interference with domestic programs.
45. Services financed under the loan will be from private firms and other non-government sources.

Loan's Compliance with Specific Requirements

46. FAA 110 (a); 208(e). In what manner has or will the recipient country provide assurances that it will provide at least 25% of the costs of the program, project, or activity with respect to which the loan is to be made?
46. The loan agreement will so provide and the planned administrative arrangements will assure it. This project is set up for a minimum of 50% host country participation.

47. FAA s 660. Will arrangements preclude the use of funds for police training or other law enforcement assistance? 47. Yes.
47. FAA 114. Will loan be used to pay for performance of abortions or to motivate or coerce persons to practice abortions? 48. No.
49. FAA 201 (b). Is the country among the 20 countries in which development loan funds may be used to make loans in this fiscal year? 49. Yes.
50. FAA 201 (d). Is interest rate of loan at least 2% per annum during grace period and at least 3% per annum thereafter? 50. Yes.
51. FAA 201 (f). If this is a project loan, what provisions have been made for appropriate participation by the recipient country's private enterprise? 51. All construction of system improvements will be implemented using host country construction contractors.
52. FAA 604 (a). Will all commodity procurement financed under the loan be from the United States except as otherwise determined by the President? 52. Commodity procurement will be limited to AID Geographic Code 941.
53. FAA 604 (b). What provision is made to prevent financing commodity procurement in bulk at prices higher than adjusted U.S. market price? 53. N.A.
54. FAA 604 (d). If the cooperating country discriminates against U.S. marine insurance companies, will loan agreement require that marine insurance be placed in the United States on commodities financed by the loan? 54. Yes.

55. FAA 604 (e). If offshore procurement of agricultural commodity or product is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity? 55. N. A.
56. FAA 604 (f). If loan finances a commodity import program, will arrangements be made for supplier certification to A.I.D. and A.I.D. approval of commodity as eligible and suitable? 56. N. A.
57. FAA 608 (a). Information on measures to be taken to utilize U. S. Government excess personal property in lieu of the procurement of new items. 57. U. S. Government excess property will be used to the extent practical.
58. FAA s 611 (b); App. s 101. If loan finances water or water-related land resources project or program, is there a benefit-cost computation made, insofar as practicable, in accordance with the procedures set forth in the Memorandum of the President dated May 15, 1962? 58. Yes.
59. FAA s 611 (c). If contracts for construction are to be financed what provision will be made that they be let on a competitive basis to maximum extent practicable? 59. AID contracting procedures will be followed.
60. FAA s 612 (b); s 636 (h). Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the United States are utilized to meet the cost of contractual and other services. 60. The GOP will provide all local currency cost. However, the loan will be used to reimburse the GOP in a Special Letter of Credit for a portion of the local cost up to 50% of subproject cost.
61. FAA s 612 (d). Does the United States own excess foreign currency and, if so, what arrangements have been made for its release? 61. The U. S. does not own such excess foreign currency.

62. FAA s 620 (g). What provision is there against use of subject assistance to compensate owners for expropriated or nationalized property? 62. The loan agreement will limit the use of loan proceeds to procurement of eligible services.
63. FAA s 620 (k). If construction of productive enterprise, will aggregate value of assistance to be furnished by the United States exceed \$100 million? 63. No.
64. FAA s 636 (i). Will any loan funds be used to finance purchase, long-term lease, or exchange of motor vehicle manufactured outside the United States or any guaranty of such transaction? 64. No.
65. App. s 103. Will any loan funds be used to pay pensions, etc., for military personnel? 65. No.
66. App. s 105. If loan is for capital project, is there provision for A. I. D. approval of all contractors and contract terms? 66. Yes, in the Loan Agreement.
67. App. s 107. Will any loan funds be used to pay UN assessments? 67. No.
68. App. s 108. Compliance with regulations on employment of U. S. and local personnel. (A. I. D. Regulation 7). 68. Yes.
69. App. s 110. Will any of loan funds be used to carry out provisions of FAA s 209 (d)? 69. No.
70. App. s 113. Describe how the Committee on Appropriations of the Senate and House have been or will be notified concerning the activity, program, project, country, or other operation to be financed by the Loan. 70. This project has been included in the FY 76 Congressional Presentation.

71. App. s 501. Will any loan funds be used for publicity or propaganda purposes within the United States not authorized by Congress? 71. No.
72. MMA s 901. b; FAA s 640 C.
(a) Compliance with requirement that at least 50 per centum of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed with funds made available under this loan shall be transported on privately owned U. S. -flag commercial vessels are available at fair and reasonable rates. 72. The Loan Agreement will contain a provision requiring compliance with this requirement.
(b) Will grant be made to loan recipient to pay all or any portion of such differential as may exist between U. S. and foreign-flag vessel rates? (b) No.
73. Section 30 and 31 of PL 93-189 (FAA of 1973) Will any part of the loan be used to finance directly or indirectly military or paramilitary operations by the U. S. or by foreign forces in or over Laos, Cambodia, North Vietnam, South Vietnam, or Thailand? 73. No.
74. Section 37 of PL 93-189 (FAA of 1973); App. s. 111. Will any part of this loan be used to aid or assist generally or in the reconstruction of North Vietnam? 74. No.
75. App. s. 112. Will any of the funds appropriated or local currencies generated as a result of AID assistance be used for support of police or prison construction and administration in South Vietnam or for support of police training of South Vietnamese? 75. No.

76. App. s 604. Will any of the funds appropriated for this project be used to furnish petroleum fuels produced in the continental United States to Southeast Asia for use by non-U. S. nationals? 76. No.
77. FAA of 1974 § 901. Has the country denied its citizens the right or opportunity to emigrate? 77. No.
78. FAA § 115. Will country be furnished, in same fiscal year, either security supporting assistance, Indochina Postwar Reconstruction, or Middle East peace funds? If so, is assistance for population programs, humanitarian aid through international organizations, or regional programs? 78. No.
79. FAA § 653 (b). Is this assistance within the country or international organization allocation for the fiscal year reported to Congress (or not more than \$1 million over that figure plus 10%)? 79. Yes.
80. FAA § 662. Will arrangements preclude use of funds for CIA activities? 80. Yes.

U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT
Manila, Philippines

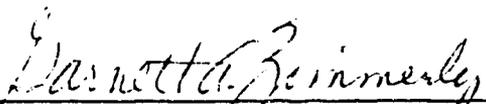
Ramon Magsaysay Center
1680 Roxas Boulevard

Telephone: 59-80-11

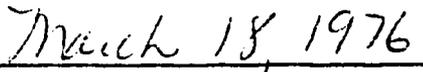
CERTIFICATION PURSUANT TO SECTION 611(e)
OF THE FOREIGN ASSISTANCE ACT OF 1961, AS AMENDED

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

This judgment is based upon the project analysis as detailed in the Provincial Water II Project Paper and is subject to the conditions imposed therein.



Garnett A. Zimmerly, Director
USAID/Philippines



Date



REPUBLIC OF THE PHILIPPINES
NATIONAL ECONOMIC AND DEVELOPMENT AUTHORITY
P.O. Box 1116, Manila

Tel. 59-70-91
Cable Address: NEDAPHIL

10 March 1976

Mr. Garnett A. Zimmerly
Director
U.S. Agency for International Development
Ramon Magsaysay Center
Roxas Blvd., Manila

U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT
MAR 15 1976

S i r :

I am forwarding for your consideration the attached letter dated 4 March 1976 of the General Manager of the Local Water Utilities Administration (LWUA) regarding a possible USAID loan of \$20 Million to implement LWUA's Interim Demonstration Program for the improvement of the domestic water supply system of 40 to 60 cities/municipalities in the provincial areas in the Philippines.

| DIV | ACT | INFO |
|-------|-----|-------------------------------------|
| ODM | | <input checked="" type="checkbox"/> |
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| AG EA | | |

The Program is the second phase of a 3-year Long-Range Planning and Interim Demonstration Program. The initial phase, which is the conduct of the long-range planning program involving the nationwide water needs survey of 100 cities/municipalities, was implemented for LWUA by the Camp Dresser & McKee International, Inc. This was financed by A.I.D. under a Letter of Commitment 492-H-03004 in the amount of \$170,000 and has already been completed. In anticipation of the implementation of this second phase, LWUA has initiated the formation of water districts in the subject localities, developed the methodology for conducting economic and financial feasibility studies, the certification program for the water districts, the Water District Commercial Practices Manual, and the required staff, systems and procedures to carry out the Program.

The proposed \$20 million loan will cover costs of:

- 1) supplies, materials equipment & construction of water system improvements - - - - - \$17,500,000
 - 2) consultant services - - - - - \$ 2,400,000
 - 3) commodities including water testing equipment, bacteriological laboratories and training equipment - - - - - 100,000
- T o t a l - - \$20,000,000



| | |
|---------------------|-------|
| ACTION TAKEN | |
| Other | _____ |
| | _____ |
| | _____ |
| | _____ |

- 2 -

We strongly indorsed this program of LWUA as we find it desirable and in line with the government's current development efforts on the rural scene. We likewise recommend favorable consideration of LWUA's request for a \$100,000 USAID grant for the training of its staff.

May we look forward for USAID favorable consideration of the request. We will be happy to pursue a dialogue with you to formulate without delay the Program.

Regards.

Very truly yours,


GERARDO P. SICAT

Secretary of Economic Planning
(Director-General)

Project Description for Loan Agreement

The Project shall consist of: (a) The continued development of the Local Water Utilities Administration (LWUA) on the national level and of independent water districts, on the local level, (b) the improvement/construction of provincial urban waterworks systems, (c) the commodities and equipment necessary to establish a water analysis laboratory and waterworks training facility and (d) Selected participant training.

CAPITAL ASSISTANCE LOAN AUTHORIZATION

Provided from: Development Loan Fund
The Philippines: Provincial Water II

Pursuant to the authority vested in me as Administrator, Agency for International Development ("A. I. D. ") by the Foreign Assistance Act of 1961, as amended, (the "Act") and the Delegations of Authority issued thereunder, I hereby authorize the establishment of a loan pursuant to Part I, Chapter I, Section 104, and Chapter 2, Title I, of the Act, to the Government of the Republic of the Philippines (Borrower) of not to exceed Twenty Million Dollars (\$20,000,000) to be made available to the Borrower to assist financing the improvement/construction of provincial urban waterworks systems; to provide engineering and management consulting services to the Local Water Utilities Administration (LWUA); to provide equipment, materials, training aids and services to a water analysis laboratory and a waterworks training facility; and to provide specialized training in the U. S.

1. Interest Rate and Terms of Repayment

This loan shall be repaid by the Government of the Republic of the Philippines within forty (40) years after the date of the first disbursement thereunder including a grace period of not to exceed ten (10) years from the date of the first disbursement. The interest on the unrepaid principal balance of the loan shall accrue from the date of the first disbursement at the rate of two percent (2%) per annum during the grace period and at the rate of three percent (3%) per annum throughout the remaining life of the loan.

2. Currency of Repayment

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

3. Other Terms and Conditions

A. The loan will finance the foreign exchange costs of the improvement/construction of provincial urban waterwork system; to provide engineering and management consulting services to the

Local Water Utilities Administration (LWUA); to provide equipment, materials, training aids and services to a water analysis laboratory and a waterworks training facility; and to provide specialized training in the U. S.

Equipment, materials and services financed under this portion of the loan shall have their source of origin in countries included in A. I. D. Geographic Code 941 (Selected Free World). The balance of the loan shall be used to reimburse the Borrower for prior agreed portions of local currency costs of construction for each waterworks system. Such reimbursement is to be through a Special Letter of Credit procedure with source and origin limited to A. I. D. Geographic Code 000 (U. S.).

B. The borrower shall relend the proceeds of this loan to the Local Water Utilities Administration (LWUA), the Beneficiary, for the purposes herein provided on terms and conditions satisfactory to A. I. D.

C. This loan shall be subject to such other terms and conditions as A. I. D. may deem advisable.

Daniel Parker
Administrator

Date

GOP and Other Donor Efforts in Area of Public Health

The GOP Four-Year Health Plan addresses itself to the following priorities:

1. Reduction of Birth Rate
2. Control of Communicable Diseases
3. Improvement of Environmental Health Factors
4. Strengthening and Extension of Rural Health Service
5. Programs in Development of Medical Service

With the exception of the first priority stated above, all are related to waterborne or water related disease and any contribution to the last four priorities is complimentary to the efforts of the provincial urban water program. Some of the GOP and other donor activities are:

With the assistance of primarily the World Health Organization (WHO) the GOP is collaborating in several areas of public health directly related to waterborne diseases. Gastrointestinal infection manifested by the recurrent outbreaks of cholera, typhoid, salmonellosis and shigellosis are, to a large extent, related to poor environmental conditions. WHO has collaborated with the GOP in the environmental health field since 1955. Technical assistance has been extended for the strengthening of sanitary services, community water supplies, food sanitation, the training of sanitary engineers and sanitarians, reviewing sanitary legislation and sanitary codes and the preparation of a manual for sanitarians.

The Philippines, Japan and WHO have been collaborating in cholera research since 1964. WHO contributes consultants and grants towards this effort.

Since 1952 WHO has been assisting the GOP in the control of schistosomiasis. Studies have been made in a pilot area of Leyte on the epidemiology and therapy of the disease as well as on the biology of the snail intermediate host. In 1965 the GOP established the Schistosomiasis Control Commission whose task is to formulate, execute and coordinate national plans for

schistosomiasis control. The present five-year programme supported by WHO utilizes the World Food Programme aid as an incentive to recruiting volunteer workers.

With funds provided by UNDP, WHO assisted in a master plan for sewerage development in the Greater Manila area. In association with the Asian Development Bank and UNDP, WHO is collaborating in water resources development connected with a project involving Laguna de Bay.

With a \$25 million loan from the IBRD, the GOP is implementing a very large health services project. It involves the building of 210 new Rural Health Units and 12 Regional training centers. The GOP counterpart funds in this project are used to rehabilitate 596 Rural Health Units and the construction of Barrio Health Stations to house 2400 new midwives who will be trained in Rural Health and Family Planning case under the project plus training for 2600 midwives, already in the program. This is a five-year program in its second year of implementation.

Republic of the Philippines
LOCAL WATER UTILITIES ADMINISTRATION
PhilComCen Bldg., Ortigas Avenue
Pasig, Rizal

MEMORANDUM for:

The Chairman
Board of Directors
All Water Districts

Subject: Classification of Connections and
Standardizing Water Rate Structures

In order to increase the viability of the water district and improve its operational performance, it is highly desirable that the Board of Directors formally adopt policies for the district on some relevant statements contained in LWUA guidelines issued for the purpose. Among some suggestions are:

- *A. Districts should formally define the consumer classification of (1) residential, government, (2) commercial, industrial, (3) wholesale.

This is necessary to insure that there is no confusion in billing customers and to likewise insure that charges are equitable among water users.

- B. No water may be delivered to any user at a rate of charge less than that established for residential users.

This will preserve the integrity of your water rate schedule and avoid claims of favoritism and grants of special favors to special groups of water consumers.

- **C. Commercial and industrial users may not be charged less than 150% of the charge for equivalent service to residential users, although for the duration of amortization payment 200% is recommended.

These classes of water users generally use water to promote their trade and hence are affluent and can easily afford to partly subsidize the low income group.

- *D. Charges for water service to government entities or for use of public faucets paid for by governmental entity should be the same as for equivalent service to residential users.

Public faucets and government offices are primary for poor people and the public service, hence must be charged the lowest rate available.

- **E. Monthly water charges to users should be composed of at least two components, a basic service charge which is a fixed minimum amount, and a variable commodity charge which is dependent upon the periodic quantity of water consumed.

The service charge carries with it a demand factor, based on the size of connection, that will partly subsidize the low income group.

- *F. Fixed service charges, to take care of the demand charge, to users of all classifications should increase in proportion to the flow capacity as the size of the service connection and meter increase.

- **G. The smallest service available should be a 1/2" x 5/8" meter whose outlet has been artificially restricted to allow a nominal one gallon per minute flow rate. This should be referred to as a 3/8" connection and should only be made available to low income residential users.

This will serve as the basis of rate computation for the basic revenue unit.

- **H. Prior to 100% metering, any unmetered user should be charged in accordance with the computations given in LWUA guidelines for unmetered connection, but it is suggested that this be not less than 125% of the estimated average charge made to the metered user with the same size of connection and number of faucets.

This higher flat rate will encourage metering and will account or make up for the wasteful use of water that normally characterizes flat rate connections.

REFERENCE: *LWUA Guidelines on Classification of Service
Connections
**LWUA Guidelines on Water Rates

If such resolutions are enacted, kindly furnish LWUA a
certified copy of each.

CARLOS C. LEAÑO, JR.
General Manager

Assessment of LWUA Institutional Capability

During the initial two and one-half years of operation, the LWUA has developed from a paper organization to an institution made up of four functioning Departments with 152 employees.

The LWUA has responded to the needs of its expanding program by an accelerating but controlled increase in staff and performance capability. In all aspects of its operations, emphasis has been placed on developing standardized methods and procedures and numerous manuals have been prepared to assist the LWUA maintain consistency in its efforts to upgrade the provincial water systems. These include a Commercial Practices Manual, a Technical Standards Manual, an Operation and Maintenance Manual and a Construction and Inspection Manual. A manual in Water District Management will be completed soon and will be available prior to the start of the Interim Demonstration Program.

Comprehensive assistance from a foreign consultant will continue to be needed during the next several years. Assistance will be provided by James M. Montgomery, Consulting Engineers, Inc. (JMM) as provided for in the JMM-LWUA contract dated July 15, 1974 and amended on January 1, 1976. The amended contract provides advisory services to the total LWUA program, including assistance in Institutional Development of the LWUA with special emphasis in training and financial operations, Institutional Development of the Water Districts, and Technical Assistance for all LWUA Improvement Programs.

JMM is scheduled to provide four engineers, a resident engineer (construction activities), a hydrogeologist, a financial advisor and several management advisors to assist the LWUA with the Interim Demonstration Program.

No attempt is made in this paper to describe all of LWUA's past accomplishments or discuss the full range of its capabilities. Discussions is concentrated in those areas which give a fair indication of the magnitude of LWUA's progress as an institution in a relatively short period. As a growing institution, the LWUA is constantly analyzing its own capability to meet the demands of its program. To date future planning and early action programs have

minimized major difficulties. Based on this good "track record" it is anticipated that the LWUA will continue with its progressive policies and develop as an institution capable of managing a program of much greater magnitude.

Specific examples of LWUA's successful accomplishments and capabilities include the following:

A. Technical Department

1. Design and Engineering Section

- a. Capability to prequalify and retain both local and foreign engineering consultants and administer the contracts. Four local engineering firms and three foreign consultants have been retained.
- b. Capability to review and approve design work by engineering firms. Design work has been completed for six comprehensive improvement projects.
- c. Capability to prequalify construction firms. Contractors have been prequalified for well drilling and for five comprehensive improvement projects.
- d. Capability to administer construction contracts. Two well drilling contracts have been successfully completed, four well drilling contracts are in progress, one comprehensive improvement contract is in progress and bids have been opened on two other comprehensive improvement projects.
- e. Capability to develop and adopt standards. A Technical Standards Manual has been completed.

2. Planning Section

- a. Capability to undertake long range planning. The initial phase of a long range planning effort (106 cities) has been completed. This was accomplished by Camp Dresser & McKee International Inc. (CDM) with counter-part assistance from the LWUA staff.

- b. Capability to undertake comprehensive feasibility studies. Feasibility studies have been completed on 13 comprehensive projects. Of these, the LWUA counterpart staff was actively involved in five of the projects completed by CDM and is presently involved in completing the last five.

3. Hydrogeology Section

The LWUA has provided comprehensive training to three engineers in the field of hydrogeology by formal training and active involvement in well drilling programs and water resource investigations.

4. Field Operations Section

Field operations to date have included numerous trips to the water districts to assist with technical and operational problems. Construction inspection activities have included conducting two comprehensive pre-construction seminars for the contractors and inspectors as well as field inspection of pipe production and construction work. A Construction Inspector Manual has been completed and is in use. Procurement procedures and documents have been prepared and assistance has been provided to the water districts in procuring water meters, pumps, chlorinators, vehicles, piping materials, etc.

- B. Loan Department

Procedures have been completed on implementing loan programs with water districts for both short term and long term loans. This includes preparation of standard loan documents and adoption of relending rates. Loan agreements have been executed with 10 water districts. Repayment procedures have been developed and collections are being made.

Loans for foreign currency have been negotiated with USAID and the Asian Development Bank. Loan conditions have been satisfactorily met.

Prior to the approval of any loan, the LWUA requires a detailed analysis of the financial condition of the loan recipient. Six detailed financial studies have been conducted to date. These

analyses include projecting loan repayment schedules, reserve requirement, operation and maintenance costs as well as water rate evaluation to determine the financial impact of any proposed loan on the water district's and its customer's ability and willingness to repay the loan.

Expertise has been developed in examining and analyzing water district financial statements on a monthly basis to monitor the financial health of each loan recipient. Financial difficulties can be predicted at an early date and allow corrective actions to be taken to protect the loan.

A long range financing plan is being developed to determine the financial capacity of the LWUA to carry out its improvement programs. Long range program costs are compared with the availability of foreign exchange currency as well as local currency.

The Loans Department investigates the financial conditions of all prospective contractors to determine their ability to meet the requirements of any project. The financial condition of said contractors is compared to criteria established during the pre-qualification procedures.

C. Regulatory Department

Well defined and proven procedures have been developed to form water districts. Since district formation is at local option, the procedures include an intensive education effort on the benefits and requirements of the LUWA program. To date, 30 water districts have been formed.

A certification program is being implemented. The program requires that before any loan is granted, a water district has to qualify for a Certificate of Conformance or a Conditional Certificate of Conformance. The purposes of these documents are to inform the water districts of the LWUA requirements and obtain firm commitments from the water districts for specific levels of improvement. Audit teams are sent to the water districts on an annual basis to evaluate district progress.

A standardized system of commercial practices has been developed, and has been installed in eight water districts. The initial installations were conducted by a consultant; however, the Regulatory Division personnel are now trained in this effort and are installing these systems on their own.

D. Administrative Department

The most pertinent function of this Department to the Interim Demonstration Program is Training. Since manpower development is recognized by the LWUA as one of its most important functions, training plays an important role in the total LWUA program.

Several programs have already been successfully implemented. These include: 1) Policy Maker Seminars for the Water Districts, 2) Management Seminars for the Water Districts and 3) Cadet Training Program. The training section also conducts the initial screening of new employees through interviews and testing and gives orientation seminars to all new employees.

Three new programs which will be implemented in 1976 include: 1) Operator Training, 2) Sanitary Engineering Training and 3) Training selected LWUA staff in management of water utilities.

THE FILIPINO WOMAN:
Her Role and Status in Philippine Society

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Forward

Women, as an important part of the provincial urban areas will benefit from the provision of a safe potable water supply system to the same degree as men. Further, LWUA has demonstrated its willingness to employ women, as is evidenced by a look at the make up of the staff. Currently 26% of LWUA's staff are women. Of the 40 women on LWUA's staff 28 are professionals and 3 of the professionals are engineers. While women have been attracted in only small numbers to the technical fields, qualified female applicants will be hired under the same criteria as for men. Also, water districts are required to include representation from a woman's organization on the Board of Directors.

While it is accurate to say that LWUA encourages participation of women, it is difficult to view this issue, except in its broadest terms. Direct participation has been indicated above, but such a narrow approach may not be meaningful - too many of the interactions of women with a program are based upon socio-cultural-political determinants, already deeply entrenched in women behavioral patterns; therefore, this Annex provides a comprehensive framework of the part women play in all aspects of life in the Philippines - and, it is within this framework that LWUA operates in expanding opportunities for women to participate

in management, administration, implementation and operations of a national water supply program.

Introduction

In recent years women all over the world have been taking stock of their situation and realizing that opportunities enjoyed by men are not going in anywhere near-equal measure to women. Following the impetus provided by the United Nations International Women's Year, Asian women have begun making their own assessments. Gradually a picture has emerged of masses of women caught in the morass of poverty-- together with men, but less likely to move out of that state as development programs aim their benefits largely at the male population. Even the materially better-off, educated Asian women handling a high-level professional position finds herself at a disadvantage vis-a-vis men in terms of wage scales, rights under civil law, and promotions to top decision-making posts. The outstanding, highly-visible women leaders found in country after country constitute impressive models of women's competence, but at the same time bring home all too clearly the realization of how scarce such women are.

While numerous Asian women remain unaware of their own disadvantaged positions, largely because they accept uncritically the traditional assumptions about women and the roles these presuppose, it is reasonable to predict that the forthcoming decade will see an awakening and new self-realization among women in all walks of life. It is in this context of understanding her role in national development that the Filipina woman, said to be the most liberated in Asia if not the world, is discussed. This report presents a general theoretical framework for analyzing her situation and reviews data related to it. It focuses in particular on the low-income Filipina in the poverty sector, who should benefit most significantly from development efforts but who might not unless concerned women and men ensure that she does.

Objectives

This Annex has two main aims: (1) to describe the current status of women who come from the low-income group within a general developmental framework; and (2) to suggest how various developmental innovations may affect the lower-income Filipina. The Annex will attempt to show how various social factors, for example, education and nutrition, are interrelated and how a change in one factor may affect other aspects of the system.

Sources of data. Published reports and field visits to six provincial cities provided the main sources of data. Library research covered general census statistics on women and studies done on the lower-income Filipina.

The six provincial cities visited were Davao, Cagayan de Oro, Iriga, Tacloban, San Pablo, and Bacolod Cities, since they are potential field sites for the larger study on the health and economic impact of a water supply system, of which this study on women is a part. In these cities researchers sought out local key informants who could provide insights into the situation of women of the city. School teachers, city officials, and old residents of the place proved especially helpful. The particular data sought during the field visits focused on information concerning the woman's role in public decision-making.

A Framework for Analysis

What factors of a woman's situation may be selected to describe her level of development? In their report "A Strategy Paper for Integrating LDC Rural Women into Their National Economies," Van Haeften and Caton (1974) have suggested general research areas and the factors affecting them as bas^{is}s for analysis. The present study utilizes the three general aspects of a woman's life mentioned by Van Haeften and Caton, namely: her physical well-being, her participation in the economy, and her status within Philippine society. It is in these three fields that women in less developed countries may be wanting of "development." This study of the lower income Filipina looks at her against this backdrop.

The concept of woman's "development" may have various concrete consequences. In the field of physical well-being, development may imply improvement; in terms of participation in the economy, it is more a need for involvement; and finally in terms of status, the goal is equality. Problems in each of these three general areas may be thus described as stemming from deficiencies that point to the need for additional improvement, deeper involvement, and greater equality.

Measuring the physical well-being of the lower-income Filipina woman should not be too difficult as the factors which affect this are easily observable. These include health, nutrition, family planning and ¹houselessness of labor. Data on these four factors are available in various Philippine records, but are not unfortunately, disaggregated into lower, middle, and upper class women. For a picture of the lower-income Filipina's physical well-being, inferences will have to be made based on the national data available.

The degree of women's participation in the economy is measured by studying two factors, namely: (1) the functions of women in the economy, and (2) the spectrum of activities in which women are involved. A description of woman's participation in the economy will depict how involved she is, or perhaps, how important her functions are in the context of the domestic and national economy.

Finally, the status of women in Philippine society is studied. Since status is a general concept which may have numerous connotations, an operational definition might prove helpful for purposes of

clarification. "Status" in this report, refers to two factors. First, it is the amount of participation of the lower-income Filipina in decision-making. Such decision-making will cover both domestic affairs and public events. Equality of the Filipina in domestic decision-making may be evaluated from two points of view. First, is the legal viewpoint which looks at the domestic rights of the woman as provided by the Philippine Civil Code. Another point of view is that of the social scientist. Several social researches that have attempted to study the Filipina's role in domestic decision-making will be cited by this report.

Status also refers to the degree to which women benefit by their participation in the economy in terms of income and education. Data on this factor will show whether the lower-income Filipina receives benefits from her participation in the economy on a level equal to that of her lower-income male counterpart. Such benefits may be in the form of income or education.

Operational definitions of these factors used to measure the Physical well-being, the participation in economy, and the status of women appear below:

.. Physical well-being

- a. Health - the physical and mental well-being of women; their freedom from pain, disease, or physical defects.
- b. Nutrition - the intake and accumulation of adequate and proper food by women for promotion of growth and replacement of worn or injured tissues.

- c. Family planning - the planned limitation of the number of children in one's family, as well as the spacing of these children to be able to provide them with proper care and education and a generally better quality of life.
- d. Arduousness of labor - the amount of backbreaking labor, performed by women in everyday life.

Participation in the economy

- a. Function in domestic activity - the activities of women within their homes related to housekeeping, and the caring and raising of children.
- b. Degree of intelligence/skill required for economic activities - the type of skills or level of education required of women to qualify them for various economic activities.
- c. Function in national economy - the participation of women as members of the economically active labor force of the country.

Status of women

- a. Participation in domestic decision-making - the amount of influence women have in decisions made within the home regarding the budget, children, and other subjects.
- b. Participation in public decision-making - the amount of influence women have in decisions made regarding community and national affairs.

- c. Quality of income/education benefits - the equality of income and educational benefits received by women in comparison to those received by their male counterparts.

In the following section, the situation of the Filipina is discussed using these factors as a general framework, with special emphasis placed on lower-income woman.

The Situation of the Filipino Woman in Society

Physical Well-Being

Nutrition

National nutrition program have constantly attempted to reach two general members of the lower-income Filipino family. These are the mother and her preschool child. The mother is of prime concern to local nutrition planners, as she not only cradles the unborn baby forming in her body, but also handles meal planning for the entire family. Yet, to a large extent, the Filipino mother remains undernourished and is wanting of nutritional improvement. Why is this so?

First, there is the pervading problem of poverty and not having enough money to buy the right kinds of food. This problem is mirrored by the percentage of Filipino families that can be classified as being below the food threshold. A "food threshold" is defined as the food budget which can meet the minimum cost diet sufficient enough to sustain life and maintain an individual for productive work. The criteria for nutritional adequacy are as follows (Abrera 1975:5-25):

* See Bibliography for all references.

| <u>Nutrients</u> | <u>Recommended per capita daily intake</u> |
|------------------|--|
| Calories | 2000 |
| Protein | 49.90 grams |
| Calcium | .56 grams |
| Iron | 10.00 milligrams |
| Vitamin A | 4064 international units |
| Thiamine | 1.03 milligrams |
| Riboflavin | 1.03 milligrams |
| Niacin | 13.00 milligrams |
| Ascorbic acid | 69.00 milligrams |

In 1971, around 57 percent of Filipino families had incomes less than the defined food threshold. This means that more than one-half of our countrymen were living in a state of undernourishment.

The Filipino mother is even more victimized than the rest of her hungry family (Intengan 1975). Typically the father and older children get the largest supply of food at mealtimes. Next comes the preschool child who has to wait to be fed by an older member of the family. The self-sacrificing mother seeks her share of food after all others have gotten theirs. Oftentimes, this is highly insufficient and does not meet her nutritional needs.

Malnutrition among mothers becomes most acute when they are pregnant or nursing. It is in this stage that they need extra nutrients to pass on to their baby. These nutrients are seldom available in the needed quantity and the mother is drained of her already inadequate nutritional supply.

Because of her family's state of poverty, the mother is pushed to work in order to augment the family income (Gonzalez 1975). To be effective workers, women need enough calories which can be supplied by carbohydrate food, protein food, fats, and oils (Intengan 1975). If she does not get these nutrients in the required amounts, her body will try to protect itself from the lack of proper food by avoiding efforts. She may therefore appear to be lethargic and lazy at work. In addition, she will be less resistant to disease, and risk increasing her rate of absenteeism because of sickness.

Although the Filipina mother goes to work to augment the family income, this does not necessarily mean that she will have healthier and better-fed children. Popkin (1975) has shown that when a mother from a low-income Filipino family goes to work, there is a general decrease in Vitamin A supply among her children. This is perhaps because most of the children's Vitamin A supply comes from vegetables, time-intensively prepared through soups. When the mother is unavailable, a simpler soup without vegetables is often provided.

The results for calories and protein intake are different. Among families whose income falls in the lowest quartile, a working mother increases her children's calorie and protein intake. This may be because food expenses from increased income goes to cereal and meats rather than to vegetables.

In order to combat widespread undernutrition among working mothers and the subsequent effects upon her children, Intengan (1975) suggests two ways of overcoming the problem. First is the establishment of nonprofit food stores or cooperatives where workers and their

families can obtain food at low prices. Second she proposes the establishment of company-subsidized canteens at work sites which can provide workers with hot nutritious meals. Aside from additional quality food, low-income mothers may profit largely from nutrition education. Nutrition-on-the-air radio programs teach women of the house how to prepare cheap but nutritious dishes. All-too-often, it is merely a question of channeling the limited food budget to the proper kinds of foods available at low prices at the market stalls.

Family planning

Another method of overcoming the nutrition problem is to control family size. When the food budget is limited, large households are more likely to have inadequate diets than smaller ones. The table below shows that the Recommended Daily Allowance (RDA) for each household decreases as the household size increases.

Table 1. Average calorie and protein intakes by household size in eight regions, Philippines: 1958-67

| Size of household | Calorie intake % of recommended daily allowance consumed by each member | Protein intake % of recommended daily allowance consumed by each member |
|-------------------|---|---|
| 1 - 3 members | 109% | 134% |
| 4 - 6 members | 87 | 102 |
| 7 - 9 members | 81 | 91 |
| 10 - 12 members | 80 | 88 |
| Over 12 members | 75 | 87 |

Aside from better nutrition, the lower income woman is rewarded by fewer domestic tasks when she limits her family size. Yet the poorer sectors of our society are characterized by large family sizes.

In a study of low-income women (Gonzalez 1976), the average number of children, 8.4., is large compared to the average Filipino family size of six children. Although 81 percent of the mothers and 85 percent of their husbands favor the limiting of family size, only 25 percent actually practice some form of family planning.

The discrepancy between attitude and actual practice may suggest that too many funds of local population programs are going into family planning education and or research. Such funds may be rechanneled into the more pragmatic fields of clinics and delivery systems. The low-gearred progress of actual family planning practice may also be caused by the nonutilization of research findings by action programs.

Family planning and population control programs in the Philippines are handled by two national agencies. These are government's Population Commission and the privately run Population Center Foundation. These two agencies coordinate and function under the overall National Population Program. After five years of operation, the population program has achieved significant increases among the target population in the knowledge about and favorable attitudes towards family planning (COPE Year-End Report 1975).

About 84 percent of rural and 94 percent of urban women had become aware of at least one method of family planning as of June 1975. Yet the attitude-behavior discrepancy reported by the National Population Program is great. In the rural areas, only 13 percent of the women are current users of family planning methods; in urban areas, figure rises slightly to 28 percent.

Recent trends reveal that the proportion of women adopting family planning has began to level off. Further, a portion of acceptors has stopped using any method of birth control (COPE Year-End Report 1975), if one judges from the decline in acceptance rates and continuation rates. Either the population program is decreasing in effectiveness on those group affected by initial strategies have already been reached.

Nonetheless, initial population control successes are beginning to impinge on deep traditional Filipino values favoring a large family. The need for disseminating this view is apparent in a recent study of poor Filipino families (Gonzalez 1976) where around 93 percent of the respondents expressed satisfaction with their large family size. Aside from parents' having no choice since the children were already there, primary reasons for the respondents' satisfaction were their managing somehow to support their children, the economic security value that children represent to parents, and the joys of family life.

General health

Apart from nutrition and family planning programs, little data are available describing the Filipino woman's health needs.

Information from the Department of Health is unfortunately not classified by male and female diseases. The Gonzalez (1976) study, however, provides some insights into the general health needs of Filipinas. Most of the female respondents in the research complained of circulatory-system-related sicknesses like anemia and dizziness. Second in their list of complaints were nervous-system-related illnesses like "getting nervous very often."

Arduousness of labor

Large proportions of Filipino women labor on the farm or engage in fishing activities. In 1973, around 39 of every 100 female workers were involved in agriculture related tasks (BCS 1973). These undertakings may be assumed to be physically demanding, requiring hours of arduous labor every day.

Aside from agriculture, women also engaged in physically arduous work involving factory jobs and domestic services. Out of every 100 females employed, approximately 19 were in commerce; 13 in manufacturing; 14 in domestic services; 12 in government, community, business, and recreational services; and 3 in personal services, other than domestic (BCS 1975). Recent increases of female workers in manufacturing may be due to the opening of industries requiring the use of women's dexterity of fingers as in packing, cigarette making, garment manufacture, radios and electronics assembly. Cigarette factories and textile-related industries have the highest rates of female employment.

Arduousness of labor for women in domestic services may warrant special attention. In the Philippines, housemaids are under the beck and call of their employer family virtually 24 hours a day. There are no working hours in the standard sense of the term, and since the maids live in the house of their employer, they can be called to serve at any time of the day or night. Households with abusive family members seldom catch the attention of the authorities and the maid is forced to suffer in silence. Despite laws and regulations protecting household help and guaranteeing their basic wages and benefits, they remain in a disadvantaged position owing to the difficulty of enforcement.

Except for the maids, who leave their own homes, other female workers are burdened by their dual role as a worker and the manager of the family's domestic affairs. After laboring for hours in the fields under the hot sun, or inside a steamy factory room, the female comes home to face another chain of duties. Outside worker or not, she is also expected to be the chief performer of family's domestic chores. Although she often helps her husband earn a living, seldom does her husband contribute his share of work to the domestic chores. It is this double role of augmenting the family income and managing domestic tasks that drains women of a large amount of physical energy.

Participation in the Economy

Functions of women in the
domestic economy

Of the various functions ascribed to the women of the house, budgeting is the task seldom passed on to anyone else. This position is often times perceived by Filipino writers as a role which yields tremendous power among the rest of the family members. Sociologist Mary Racelis Hollnsteiner, and anthropologist Maria C. Roldan Burcroff suggest however that the purse-holder of a subsistence-level family actually possesses little power since there is only a very small amount of money to handle; almost every centavo destiny is predetermined by poverty circumstances (Hollnsteiner and Burcroff 1975:10). While the woman's role as treasurer ascribes a certain role importance to her, she is significant only in theory until family earnings are substantial enough to give her skill genuine importance through the exercise of options. Gonzalez's study (1976) supports Hollnsteiner's viewpoint. The study shows that after expenses for food, home operation, education, and clothes are taken care of, there is very little money left to save. Gonzalez concluded that ". . . even if nearly all of the women act as family treasurers, they are unable to exercise the power and resource allocation component of this function properly."

In order to help alleviate the family's poverty the Filipina woman in the lower-class families often decides to enter the labor force. She gets a job not because she seeks self-fulfillment

or professional success but because her family is in dire need of money (Gonzalez 1976, Abad 1972, and Marquez 1959). Women often begin doing "sideline" activities such as buying and selling jewelry, keeping a sari-sari store, or raising poultry, swine, and cash crops.

Other domestic chores usually handled by the woman of the house are: taking care of the children, particularly the preschoolers, marketing, and housekeeping. When household chores prove to be too taxing, a laundrywoman is hired by those slightly better-off women to take over the burdensome tasks of washing and ironing family clothes (Department of Labor 1974:22-23). Such luxuries, however, are not permitted to lower-income women.

Functions of women in the national economy

Unlike her significant roles on the domestic scene, the functions of the woman worker in the national economy loom far less important than those of her male counterpart. In fact, it is in this field that many progressive Filipino women are clamoring for reforms.

Unemployed women outnumber unemployed men. This means that there are more females than males who are actively seeking work (Abad 1972). Highest unemployment rates for females are found in transport, storage, communication, and domestic services (BCS 1974: 46, 47).

As of November 1974 about 68 percent of the females above 10 years old were not in the labor force (NSSH 1974:8). Contrast this

with the economically active men, with 50 percent of males 10 years old and over classified as part of the nation's labor force. The large percentage of females excluded from the labor force class should be considered vis-a-vis innovations in work areas. Although formal changes may be easily effected through the organized labor system, these benefits may influence only one-third of the adult female population in our country. The other two-thirds will have to wait for changes in other social systems to obtain benefits.

Differences, however, have to be made between "official" and "unofficial" labor figures. Official data are information gathered and processed by the Census office. Most of the "official" jobs reported in such surveys are those involving a fixed employer and regular wages. The woman, however, is often involved in "unofficial" income-generating activities which are seldom perceived nor reported as jobs. These activities are seasonal (i.e., largely when the family is in an economic crisis) and market-related (Boserup 1970). In a survey of the Cebu population (Popkin 1975), 26 percent of the urban and 31 percent of the rural women were engaged in some type of market employment. Some examples of rural female occupations were dressmaking, peddling, shoemaking, farming, and working in a small-industry establishment. In the urban areas women were either vendors/peddlers, artisans, dressmakers or owners of small shops.

In census reported occupations (see Figure, p. 18) female employees tend to outnumber the males in the professional, technical and related occupations. From 1960 to 1964 there were more female

than male employees in crafts, production-process and related occupations. Nevertheless, the male employees have outnumbered the female employees in these occupations since 1965.

Of the total employed for both sexes in each occupation in November 1973, females exceeded males in three types of occupations (see Figure 1, p. 18):

- a. Professional, technical, and related occupations by 18 percent;
- b. Sales occupations by 16 percent; and
- c. Service, sports, and related occupations by 25 percent.

Male workers in the same year outnumbered their female counterparts in seven types of occupation:

- a. Administrative, executive, and managerial positions by 56 percent;
- b. Clerical positions by 9 percent;
- c. Farming, fishing, logging and related occupations by 54 percent;
- d. Mining, quarrying, and related occupations by 86 percent;
- e. Transport and communication occupations by 96 percent;
- f. Crafts, production-process and related occupations by 51 percent; and
- g. Manual occupations by 96 percent.

The woman's dominance in the professional-technical fields may be caused by an over supply of females who are nurses and teachers.

A study by a private educational institution found that around 37 percent of the sample college-bound high school females listed nurse (or midwife/laboratory technician) as their most liked occupation. The next choice, education, came in a poor second, with 5 percent. The table below contains the top 20 occupations ranked according to frequency of choice.

Table 2. Frequency and percentage distribution by most liked occupation in 1974-75 college-bound females

| Rank | Female choices | Number | Percent |
|------|---------------------------------------|--------|---------|
| 1 | Nurse, midwife, laboratory technician | 61,783 | 37.39 |
| 2 | Educators | 9,036 | 5.47 |
| 3 | Doctor, physician | 7,922 | 4.79 |
| 4 | Cashier, accounting clerk | 5,783 | 3.50 |
| 5 | Nutritionist, dietician | 5,287 | 3.20 |
| 6 | Accountant, auditor | 5,190 | 3.14 |
| 7 | Medical technologist, therapist | 4,694 | 2.84 |
| 8 | Pharmacist | 4,507 | 2.73 |
| 9 | Engineer | 4,445 | 2.69 |
| 10 | Clerk, office operators | 4,372 | 2.65 |
| 11 | Social worker | 3,993 | 2.42 |
| 12 | Diplomat, foreign service | 2,478 | 1.50 |
| 13 | Business proprietor | 2,168 | 1.31 |
| 14 | Business executive | 1,742 | 1.05 |
| 15 | Business salesman, buyers | 1,708 | 1.03 |
| 16 | Service worker | 1,689 | 1.02 |
| 17 | Dentist | 1,364 | .83 |
| 18 | Scientist | 1,296 | .78 |
| 19 | Writer, journalist | 1,204 | .73 |

Source: De Vera 1975:35

What may be noted about female-dominated jobs is that they seldom entail strategic, decision-making tasks. Even if a seemingly high percentage of women are in the professional-technical field, it is safe to venture that this figure is inflated by the large number of nurses and teachers. Nonetheless, in the medical and educational fields, men occupy the higher decision-making posts of administrators or hospital directors.

In lower-paying jobs, there is less discrimination between men and women. The influx of women into "masculine" lower-paying jobs seems faster than their influx into "masculine" upper-level occupations. Women are often found carrying out jobs as bus conductresses, bus inspectresses, street sweepers, paper garbage collectors, elevator inspectresses, and police women. Female workers are also beginning gradually to trickle into the more sophisticated fields of computer technology, the stock market and investment financing.

What are the factors that affect the employment of women on the Philippine labor scene? The recent Seminar Workshop on Women Workers held in February 1976, defined seven general factors.

First, there is the traditional cultural distinction between men's work and women's work. Unfortunately, what is categorized as woman's work reflects the connection with home activities (like being a laundrywoman or a governess). They are low-skilled and low-paying jobs. Such low-skilled jobs are usually disdained by

men and thus left to women, whose supposed finger dexterity (as needed cigarette rolling or mechanical weaving and allegedly greater ability to concentrate on tedious tasks makes them ideal workers.

Another factor which affects female employment is the auxiliary character ascribed to woman's work. The local traditional concept of a woman's task involvement is that of filling in the gaps only when need arises, or adding to the work force owing to high seasonal demands for particular products. Hence they merely continue what has been started in the past and do not initiate or take direct responsibility and authority for what is done.

Third, there is the concept that women's work is marginal and dispensable. She joins as an active economic participant at home or in the office only to augment income during times of difficulty. However, when immediate personal, family, or national crises are over, she withdraws into her strictly household role.

The woman worker is also handicapped by her relative immobility. She is reluctant to accept work far from home as she wants to be physically available to her children. For lactating mothers, a workday's noonbreak provides a mid-day supply of breast milk for the infant. Popkin's Cebu study (1975) found that Cebuano women working close to their homes are not deterred from breastfeeding their children. However, there is a highly significant decline in breastfeeding when the mother works in a different barrio. Further she usually moves with her husband if he is assigned or takes a position in some other location.

A fifth factor affecting the Filipina's status in the national economy is the extreme elasticity in the supply of female labor. When the male breadwinner of the family becomes unemployed, the woman enters industry for whatever wage she is offered; and there is a temporary over-supply of cheap labor. Men are then left the alternative of being displaced by women or working for lower wages than they would otherwise have to accept. This results in an indirect undermining of the standards of wages of adult males.

Another factor to be considered in evaluating female employment is the greater incidental cost involved in the employment of women such as maternity leaves. Protective labor laws of women have made it more expensive to hire women than men. In fact, some employees contend that labor laws put them in a position where they cannot afford to pay women as much as they pay men for the same physical output.

Finally, the woman's self-perception and value system often influence her choice of work. Women, particularly in the rural areas, perceive themselves to be in subordinate positions to men vis-a-vis organized work. Female workers are also inclined towards certain careers more than others. Careers involving sustained human contact which fulfill nurturance needs to give of themselves with a high sense of devotion often attract women.

Intelligence/skill required
for economic activities

In general, the better-paid female jobs require a college diploma or some special talent in public relations. College diplomas are often required in professional fields like teaching and nursing. Public relation skills valued in a female employee may be speaking English fluently, knowing how to sell things, or being able to cook foreign dishes. For lower-level jobs, finger dexterity is often considered in an asset among women. This skill helps them get into factory jobs require women to patiently concentrate on routine and tedious mechanical tasks such as wrapping candies or labelling packages. Particular jobs utilize the woman as an "attraction." A beautiful face and an attractive body are needed by women who want to be hospitality girls. This covers sheer sex exploitative occupations like massage parlor attendants and prostitutes.

The Bureau of Women and Minors has drawn up a list of common female jobs and the corresponding academic or non-academic credentials needed for these occupations. Only college graduates specialized in subjects or courses related to the nature of duties below are hired to fill the following positions:

| | <u>Major subject/course/or</u> <u>additional requirements</u> |
|--|--|
| a. Accounting executive, accountant | major in accounting |
| b. Assistant building administrator | law or commerce |

- | | |
|--|--|
| c) Tutor Teacher (physical fitness) | PE major |
| d) Executive secretary | BSE, AB or commerce major in accounting |
| e) Project analyst, sales assistant, public relation officer and receptionist | any collegiate course |
| f) Stenographer typist | steno-typing |

Other female jobs requiring training and experience are as follows:

| Job opportunity | Training and Experience |
|--|---|
| a) nurse, clinical ins-trustress | clinical experience |
| b) office assistant, factory worker | experience in industrial machines |
| c) Obstetrician | at least 6 months training |
| d) Dressmaker (cut and sew) | experience in high speed machine; experience in flat seamer machine |
| e) Housemaid | Ability to speak English |
| f) Tutor or teacher, a go-go dancer | Knowledge of polynesian dances, modern jazz and slimnastics |
| g) Cook | Knowledge in cooking Filipino and foreign dishes |
| h) Accounting sales collector | Sales experience |
| i) Civic worker | Knowledge of social, religions, civic, educational, community or any group work |
| j) Sales lady | Experience in selling garments |

| | |
|-------------------------------|--------------------------------|
| k) Commercial representative | Good communication background |
| l) Department store saleslady | Experience in selling garments |
| m) Governess | Ex-teacher |
| n) Field Supervisor | Field sales experience |

Status

Participation in domestic decision-making

Leticia Shahani, current Philippine Ambassador to Romania, recently stated that "...the Filipino woman exercises disproportionate power and control in the house to the point of emasculating and weakening the male" (Shahani, 1975 p. 136). How true are these impressions of the woman as having a dominant sphere of influence within her home? Various Philippine laws and empirical studies shed light on the issue.

The Philippine Civil Code contains several discriminatory provisions against the Filipino woman (Cortes, 1975 pp. 13-14). While a daughter is old enough for the responsibilities of marriage two years earlier than a son (a daughter may marry at age 14 while a son may not validly contract marriage until he is 16) the same law restricts a daughter's choice of where to live until after her 23rd birthday. A son is given this freedom of choice when he turns 21. There appears to be a lack of consistency in these provisions. Deeper investigation reveals, however, that the code

on marriage simply passes the daughter from the authority of her parents to that of her husband.

In a husband-wife relationship, the civil code asserts the superiority of the man over his woman partner. Husbands may accept gifts from anyone, but the wife cannot, without her husband's consent, acquire any property by gratuitous title, except from close relatives. In addition, the husband has the right to object to his wife's exercise of a profession or occupation or her engaging in business under certain circumstances. When his income is sufficient for the family according to its social standing or for any other serious or valid reason, the husband may exercise his right over his wife's holding an occupation.

Another example of discrimination is in the field of legal separation. A husband may rightfully win a separation case on the basis of a single proven act of his wife's infidelity. On the other hand, wives cannot win separation cases even when their husbands are flagrantly disloyal, concubinage being the grounds in his case. A double standard permits men much more freedom from the bonds of conjugal commitments than it does women. The latter are subject to much stricter norms.

Disloyalty on the domestic scene may be viewed from another perspective. Shahani proposes that women are so dominant in their homes that their husbands seek ego-definition by having affairs with other women. She adds that the querida system, where mistresses or common-law wives are maintained, is a male attempt to correct the imbalance.

Aside from the Civil Code and accounts by women thinkers, social researchers have carried out field studies to help clarify the woman's role in domestic decision-making. Two research projects carried out by the Institute of Philippine Culture focus on domestic decision-making. The first (Porio et al, 1975) is a cross-class survey of 15 urban centers in the Philippines. The second (Gonzalez, 1976) sampled lower class-respondents in three areas, urban, semi-urban and rural.

The Porio study covered six decision-making areas. These were the (1) disciplining of children, (2) choosing of the child's school, (3) determining what action to take in matters of family investments or business, (4) choice of children's high school or college course, (5) choice of friends, and (6) handling the household budget. Results show that father and mother participate equally in deciding on the first three areas. In the fourth and fifth fields, the decision is most frequently vested in the child himself. In the sixth area of budgeting, the wife claims complete control over matters.

The results of the Gonzalez study also suggest that there is a trend towards egalitarian decision-making where husband and wife frequently consult each other. Although particular concerns are identified with the woman and others clearly fall under the sphere of the man, the final decisions are done only after consulting with the other spouse. Women hold more power in decisions affecting domestic activities like household chores, care of

children, discipline of daughters and budgeting. Men, on the other hand, exert greater influence over matters of livelihood or occupation and the discipline of sons. The family's social and leisure activities are equally planned by the mother and father.

In summary, the two studies suggest that the woman is not as domestically powerful as initial impressions describe her to be. Much of the decision-making in the home is equally exercised by both parents. Although the woman can claim control over the household budget, lower-class families have little income to offer the female treasurer. Hence the power vested upon her is largely mitigated by their general state of poverty.

Participation in public decision-making

Women's power at the community level is generated by three types of female organizations. One kind is the social group composed of "high society" women of the community. Oftentimes these women are wives of male organization members. For example, the Lions have the Lionesses, the Jaycees have the Jaycerettes, the Rotarians, the Rotaryans, and the Kiwanians, the Kiwanettes. Despite the many successes these women's branches achieve quite apart from the male organizations, the women's dependence on their husband's social activities can be noted. For example, Rotaryann membership becomes automatic when the husband joins the Rotary but not vice-versa. Likewise, a wife joins the Jaycerettes after her husband gets involved in the Jaycees. For the year 1975,

the Bacolod Rotaryans merely supported projects of their male counterparts. In a Visayas sugar central, the officers of the women's club paralleled the status hierarchy of their husbands in the work setting (Dungo 1969:121-23). The notion of helpmate rather than initiator comes through strongly; the men get much of the credit for activities actually carried out by their wives.

Upper class women groups initially organize to carry out civic-oriented activities, like hospital visits, donations to indigent families, and setting up local children's libraries. Worthy though these aims are, it is relatively difficult to mobilize the women for these projects. Highlights from this study's field interviews provide some notable insights. One local woman officer noted that she has an easier time getting her members to attend social affairs (like parties and afternoon get-togethers) than organizing them for effective social action. The disinterest was aptly explained by another key informant of the field interview. She surmised that women join these clubs to increase their social contacts either for their own advancement or more so for that of their husbands. Hence, highly social affairs like parties are to them more important than task-oriented gatherings.

Most of the community-based women's groups have upper class membership. Lower-class women's organizations are usually created by the government's social service arms like nutrition, family planning, and health programs. Here, however, the woman tends to be seen as an object of development and not the subject or an

active participant in the developmental process. Her activities and training within government-guided groups are planned on the national level; she becomes a mere recipient of government benefits.

A third type of community-based women's organizations are church groups. Church associations have two outstanding characteristics. First, they attract the more religious or openly pious members of the community. Second, it is usually in church groups that women of the various income classes get to meet one another. A wellknown organization present throughout the Philippine parishes is the Catholic Women's League. At the parish level membership is usually a mixture of lower-income, middle class, and rich women. Leadership roles generally go to the higher class members.

On the national level, the woman's voice is expressed through nationwide civic groups and participation in labor unions. As of January 1975, the Civic Assembly of Women of the Philippines (CAWP) claimed 67 organizations under its umbrella association. It also reported five existing groups that were not yet affiliated with the CAWP. Hence, there was a total of 72 women's organizations by the start of 1975. Membership figures for each group, however, were not available and conclusions on the influence of such groups within the Philippine social base remains in question.

In the labor sphere, participation of women is in dire need of improvement. As of 1969, only 12 out of 26 federations claimed women membership. Less than one-half of the national labor federations had women members. For independent and non-affiliated unions

the picture is slightly brighter. Some 58 out of 113, or approximately one out of two independent labor unions have female members.

The limited participation of women workers in union activities may be explained by four factors. First, women's employment is usually seasonal and transient. Second, women, particularly in agriculture are unpaid family workers; in addition "sideline" jobs undertaken to augment the family income ordinarily fall under the category of self-employment. A third block stems from her numerous family responsibilities; domestic tasks drain much of her time outside the work place. Finally, there seems to be a general disinterest among women towards labor groups, perhaps caused by their perception of unionism as primarily a man's activity.

Equality of income and education benefits

Equality of income and educational status of women vis-a-vis their male counterparts looms as an important aspect of development. Two general questions may be answered by this section. First, does sex affect the amount of income earned by workers with similar occupations? Second, are women offered equal educational opportunities as men are?

A glance at census data shows that the female earns generally less than the male in the same industry group. Table 3 compares the average weekly cash earnings of both sexes in 10 major industries (NSSH, 1974). The figures in parenthesis in the right hand column define the ratio of the average female earnings to that of the average male.

Table 3. Total and average cash earnings during the survey week of employed wage and salary workers by major industry group and sex: November 1974

| Type of work | Average weekly cash earnings | |
|--|------------------------------|----------------------|
| | Ave. earnings | Ave. female earnings |
| Agriculture, forestry, fishing and hunting | P 36 | P 26 (.72) |
| Mining and quarrying | 88 | * |
| Manufacturing | 64 | 41 (.64) |
| Electricity, gas, water, and sanitary services | 117 | * |
| Construction | 61 | * |
| Commerce | 82 | 58 (.71) |
| Transport, storage and communication | 66 | 102 (1.54) |
| Government, community business and recreational services | 93 | 87 (.93) |
| Domestic services | 17 | 14 (.82) |
| Personal services other than domestic | 53 | 33 (.62) |
| Industry not reported | 117 | * |

Source: National Statistics Survey of Household Bulletin, 1974.

*Number of persons involved was less than 9,500. Proportions were not computed when the estimate is less than 9,500.

The largest discrepancy between males and females is in the manufacturing industry, where women's earnings come to only three-fifths of the men's earnings. Other fields reflect a pattern of

lower pay for the women. The exception is in the field of transport, storage, and communication, where the woman's average weekly income is one and one half times that of the man's.

What may be the reasons behind a generally lower income for the female workers? Both rational causes and prejudicial attitudes may influence the lower-income rates of women.

Women tend to work fewer hours in formal employment than men, since the latter do not have to worry about additional domestic chores. A 1973 census survey showed that more males than females worked 40 hours and over during the week. Aside from being free of domestic responsibilities, the man tends to work more hours as he is the main breadwinner of the family. His reported weekly earnings rise above that of women as he puts in more work hours in an average week than his female counterpart. Further, more males than females hold strategic decision-making positions, e.g., executive, administrative, and managerial positions. These positions demand higher salaries than the more routinary jobs at the lower levels.

Prejudicial attitudes, however, also come into the picture. Some companies believe that women should not be given the same pay, lest it invite serious competition with men. The feeling that as the breadwinners men should be given higher priority in employment works against the interest of women. Other employers think that men are more efficient than their female counterparts and hence deserve to be paid more. Finally, there is the cost-benefit attitude.

Some labor laws make it more expensive to employ women; the company indirectly compensates for the additional benefits women receive by paying them lower wages.

In the field of education, there appears to be little discrimination against woman, at least in terms of enrollment. Perhaps because men in the family are pressured to earn a living, it is the male children who usually drop out of school during times of economic crisis to help their parents through the hard days. The females, on the other hand, tend to hold on through high school and college levels of education. In the Philippines during the School Year 1970-71, as in the preceding school year, available private school records show that there were more female students (52 percent) than male enrollees. As a general rule, enrollment of both sexes declines in higher educational levels; females, however, still outnumber the males in collegiate and graduate levels of education.

Some aspects, however, of our education still discriminate between the sexes. Qualitatively, women and men are often trained differently. In the lower grades and in high school, boys are given technical courses and the girls, home arts. These early orientations tend to influence self-perceptions of skill, later courses, and job choices. In college, women enroll in education, and nursing. In technical schools, they enroll for dressmaking and cosmetology. The boys, on the other hand, enter law, medicine, engineering, science, and the various trades.

While they are not required to make these choices, men and women have learned to abide by the decisions society apparently expects them to make. Curricula train the girls for feminine tasks and the boys for masculine ones. Given these skills, their recipients bring them to their logical conclusion by carrying them out in career choices.

One area of discrimination in education appears in the number of women holding positions of higher authority. Although 64 percent of the teaching force are women teachers, the proportion of male supervisors and superintendents to females ones is one female to every four males. The general rule for almost all employment sectors is that even when women actually outnumber men in the work force, they rarely attain the higher decision-making posts. These remain the male preserve.

Summary

Results of this research bring to the fore several aspects of the lower-income Filipina's situation that need development.

Her physical well-being is in need of improvement. Under-nutrition and even malnutrition have victimized lower-income women, particularly those who are pregnant or nursing. The self-sacrificing mother often gets the remaining morsels of food after the rest of her family have eaten.

Oftentimes, her family is large, requiring enormous physical labor expenditure on her part. Family planning programs have managed to increase knowledge and change some traditional attitudes towards contraceptives, but actual practice remains minimal.

Because of the many mouths to feed, the woman of the house often seek work to augment family income. In rural areas, she engages in strenuous agricultural tasks while her urban lower-income counterpart takes on a market-related occupation or a factory job. Both generate meager incomes through home industry crafts and other activities. Despite this often heavy schedule of work, she is expected to handle numerous domestic chores as well. When undernutrition and the physical demands of her female role in the family become excessive, the woman's general state of health is impaired. Common complaints of women focus on circulatory-related sicknesses like anemia and dizziness.

Aside from improving her physical well-being, the woman also needs to increase her involvement in the national economy. Unemployment rate for women are higher, however, than those of men. When women are absorbed into the work force, they are given the peripheral lowly-paid functions and are seldom placed in strategic, decision-making positions. The woman seeking to enter the work force requires particular skills. Professional occupations, most common of which are nursing and teaching, require college diplomas. Other jobs revolve around her "attractive qualities." Factories usually employ women for their finger dexterity, cigarette or textile industries being the chief hirers.

The woman is more involved in the household than in the national economy. Since she engages in marketing activities she possess

rudimentary business management skills. At home, the woman controls the family budget and decides where the money should go. In lower-income families, however, the amount of money available is so limited that the woman seldom has any genuine power in these matters. Circumstances of survival determine how each centavo should be allocated.

Other domestic chores of the woman of the house are taking care of children, particularly the preschoolers, housekeeping, raising vegetables, swine and poultry. Men, on the other hand, are expected to discipline their growing-up sons and to decide on the general livelihood of the family.

Although domestic tasks are relatively well-defined, the decision-making process within a family is largely egalitarian. Father and mother consult each other often before arriving at a final decision. Findings on egalitarianism disprove, to a certain extent, the general notion that the woman has the upper hand in the home. Children also participate in decision-making. In fact, the choice of a high school or college course and the choice of friends are usually left to the children.

Unlike her role in domestic decision-making, the woman is given less of a voice in public decision-making. Even upper-class women show limitations here. They often join civic groups when their husbands decide to join groups like the Rotary, Jaycees, and Lions. Thus they become Rotary Anns, Jaycerettes, and Lionettes. There

are however, other women's groups which are quite independent of specific male groups. Many of these engage in welfare-oriented projects.

Among lower-class women, there is little impetus to participate actively in community organizations. Most woman-groups on the grassroot level have been formed by government social service programs interested in promoting health, nutrition, family planning and the like. These women are expected to respond to instructions rather than generate them.

Even in labor unions, the working woman's only formal channel of expression, her voice is weak. As of 1969, half of the nation's unions had no women members. The transient nature of female labor, the call of domestic chores, and a general disinterest in labor unions influence the woman's weak position in labor decision-making. When faced with lower wages than her male counterpart, a non-infrequent happening as industry figures show, the woman worker often accepts her lot. The situation stems from a combination of woman's actually working fewer hours than men and sheer prejudicial attitudes towards female workers.

Unlike labor, the field of education tends to be more beneficial to the woman than the man. The females in the family are permitted to go into higher levels of education while the sons drop out of school whenever they are needed to augment the family income. Nonetheless, girls are taught feminine subjects like home arts and

boys more mechanical skills; their adult careers reflect this bias. In another sense, the education field does discriminate against women in the disproportionate number of men who hold higher positions compared to the number of men in the field as a whole. As in most areas of occupations, Filipina women may strive hard but they rarely get the higher-level positions with higher salaries and more decision-making powers.

The field of woman's development, particularly that of the lower-income Filipina has numerous aspects that are wanting in developmental innovations. Whatever changes are introduced will have repercussions on the other factors in her social system. Any single innovation will have its impact on her other needs. In order to understand more clearly how various innovations will affect the Filipina, a system for analysis is proposed. Such a system will help the change agent or the change-sponsoring institution to evaluate the effects of their planned innovation on the Filipina. A presentation of the proposed system follows.

A System of Analysis for Women's
Development

All too often changes are introduced into the woman subculture that ignore the less observable but equally significant impact on other aspects of her social situation. Changes in her physical well-being have important consequences for her economic functions or role as a public decision-maker. Likewise, innovations in family

planning effect other physical development factors, such as the woman's nutrition or her level of health and welfare.

In order to clarify how the various factors affect the lower-income Filipina and how they are related to one another, a systematic analysis is necessary. Such a system will facilitate further interpretation of how different developmental innovations influence the social system that cradles the low-income Filipino woman. The models suggested may be used to generate further research on relationships among factors in the system. Current relationships established by the system are not completely supported by available research data. To make this system more scientifically airtight further controlled researches will have to be undertaken.

Two approaches are appropriate. The first consists of a table containing the factors previously discussed and defined (see Table 4 on page 42). This table forms a matrix in which the factors enumerated in the columns and rows are identical. For purposes of this analysis we will consider those in the columns to be influencing factors and those in the rows to be those factors which are influenced or affected by changes in the influencing factors. An "X" at the intersection of two factors indicates that a direct or first-order relationship exists between these two factors. For example, there is an "X" at the intersection of the column of "Health" and the row of "Function in National Economy." This mark indicates that changes in the health situation of women affect their function in the national economy.

Table 4. System of analysis showing relationship of various developmental factors on women

| Factors affected | Influencing factors | | | | | | | | | |
|---|---------------------|-----------|-----------------|----------------------|------------------------------|---|------------------------------|---|---|---------------------------------------|
| | Health | Nutrition | Family planning | Arduousness of labor | Function in domestic economy | Degree of intelligence/skill required for economic activities | Function in national economy | Participation in domestic decision-making | Participation in public decision-making | Equality of income/education benefits |
| Health | X | | | X | X | | X | X | | |
| Nutrition | | X | | | | | | X | | |
| Family planning | | | X | | | | | X | | |
| Arduousness of labor | | | | X | | X | X | | X | X |
| Function in domestic economy | | X | | | X | | | X | | |
| Degree of intelligence/skill required for economic activities | | | | | X | | | | | |
| Function in national economy | X | | | | | X | | | X | X |
| Participation in domestic decision making | | | | X | | | | X | | |
| Participation in public decision making | | | | | | | X | | X | |
| Equality of income/education benefits | X | | | | | | | X | | X |

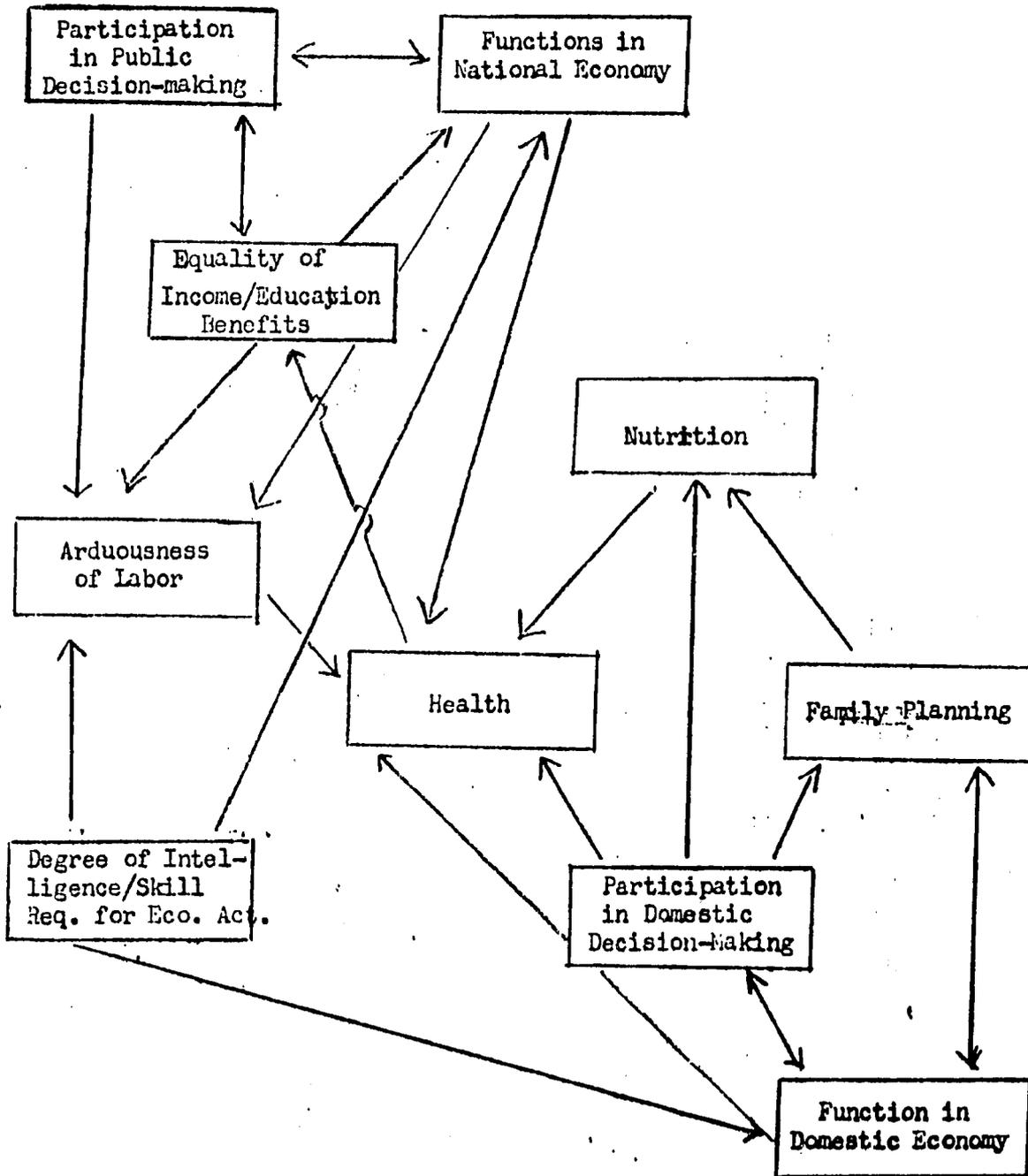
All the factors in the table are of course interrelated. However, those which are significantly related in terms of one factor's affecting the other(s) directly have been marked to highlight these relationships.

This approach to analyzing the woman's social system has certain advantages. First, the table easily illustrates the relation of various social factors to one particular factor under study. For example, if one were interested in the effects of a health innovation, a glance down the column of "health" would point to the factor(s) that would be influenced by a change in the health factor. If, on the other hand, a development agency wanted to improve the health situation in a particular area, reference to the row of "health" would give the agency information on what other social factors should be influenced in order to maximize health improvement.

In addition to the table, a second approach is offered by this Annex. Factors in the social system are boxed into distinct entities and are connected to each other by arrows (see Figure 2 on page 44).

The direction of the arrow indicates what kind of relationship exists between the two factors. An arrow that moves away from a factor implies that this factor is the influencing factor in the relationship. The factor to which the arrow points is the factor which is influenced in the relationship. The length of

Figure 2 ; SOCIAL SYSTEM SHOWING RELATIONSHIP OF VARIOUS DEVELOPMENTAL INDICATORS



arrow is irrelevant in this particular system of analysis. Hence, a long arrow should not be associated with a greater degree of relationship than a shorter arrow. The data used and relationships defined in both are identical. Only in format and presentation do the approaches differ.

The second approach is a graphic presentation of the relationships between factors. At a glance, it helps the reader consider all the factors simultaneously and see how each factor is related to the other. Further, the clustering of factors would suggest how a woman's social system is organized.

Specifically, a glance at the illustration shows that the woman's life is roughly divided into two general areas, her public life and domestic affairs. This is because the public life factors of participation in public decision-making, function in the national economy, equality of income/education benefits, arduousness of labor, and degree of intelligence/skill required for economic activities are clustered in the upper-lefthand portion of the illustration. "Domestic affairs" factors, on the other hand, are clustered in the lower-righthand part of the illustration, which contains the variables of health, nutrition, family planning, participation in domestic decision-making, and function in the domestic economy.

The dichotomy between the woman's public life and her domestic affairs is not a novelty in this particular system. Rosaldo (1974)

has suggested that these two concepts comprise the theoretical framework for conceptualizing the activities of the sexes. In her article, Rosaldo defines "domestic" as those institutions or associations that have to do with mother-child groups. On the other hand, "public" refers to those institutions or associations that go beyond such mother-child relations. Rosaldo suggests that women are usually tied up with domestic life, and men with public life. Recent trends in women's liberation movements, however, have increased the participation of women even in the public areas of life. The reverse trend of men participating more heavily in domestic life is not so apparent but increasing slowly.

Developmental programs will have to approach the problem of women from two angles. Firstly, in the domestic scene, women will have to be set free from the enslaving demands of household routine. When husbands obstinately refuse to help out in domestic chores, the woman has no other choice but to carry upon herself the weight of household tasks. Development programs may mitigate this burden. Nurseries for preschool children, communal kitchens, and technological innovations will absorb numerous time-consuming and energy-draining functions of the woman.

Secondly, women should be adequately prepared to enter the national economy as equal co-workers of men. Training programs should give her the skills necessary to function efficiently in a developing country. Moreover, age-old prejudicial attitudes

should be overcome in order for the woman to be truly equal to the man in the work force. Genuine opportunities for strategic decision-making jobs have to be made available to women capable of taking on such functions.

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MEMORANDUM OF AGREEMENT

BY AND BETWEEN

THE LOCAL WATER UTILITIES ADMINISTRATION

AND

THE INSTITUTE OF PHILIPPINE CULTURE
ATENEO DE MANILA UNIVERSITY

KNOW ALL MEN BY THESE PRESENTS:

This Agreement made and executed in Quezon City, Philippines
this _____ of January, 1976 by and between:

The Local Water Utilities Administration, with principal office
at the PhilComCen Building, Ortigas Ave., Pasig, Rizal, represented
in this Agreement by its General Manager, Col. Carlos Leño, here-
inafter referred to as the LWUA

- and -

The Institute of Philippine Culture, Ateneo de Manila University,
a research organization that studies local problems of social organiza-
tion and cultural values, with offices at Bellarmine Hall, Loyola
Heights, Quezon City, represented herein by its Director, Ms. Mary
Racelis Hollnsteiner, hereinafter referred to as the I. P. C.

The parties hereto mutually agree as follows:

I. SCOPE OF THE AGREEMENT

A. General Statement

Upon the request of the LWUA, the I. P. C. will provide
research services to the LWUA program by undertaking
an evaluative study of the health and economic impact of
an improved water supply system in selected Philippines
provincial cities. The LWUA program which is partly assisted
by the United States Agency for International Development
(USAID) focuses on the construction of improved water supply

systems in selected Philippine provincial cities. It reflects the belief, to be verified, that its effects will ultimately have a beneficial impact on the health and economic development of the participating communities. The most applicable strategy for the abovementioned-evaluation-study is to ascertain the manner and extent to which improved water supply affects community welfare. In brief, the following will be considered in undertaking the study, which is expected to run over a period of four years starting 1976.

1. To access the health and economic impact of the new water supply on the city populace within the area of coverage, over a four-year period;
2. To give special attention to the water supply system impact on certain groups, namely:
 - a. the marginal slum and squatter areas (where community rather than individual water connections will be likely);
 - b. the economically mixed areas (whose low and lower-middle income families residing in higher quality structures and surroundings allow for more individual house connections;
 - c. the pre-school children in terms of health benefits, and
 - d. the women in terms of their changing development contributions both at home and in outside work areas.
3. To ascertain in general sense other results of the new water supply system on the broader institutional areas of city life, for example, commerce and industry;
4. To determine the performance levels of the water supply system in terms of quantity and quality of directly planned physical and service outputs.

The whole study, which will run for four years, will be divided into four phases in a "before-after" comparative study design. These are indicated hereunder. For this

particular agreement, however, only the first two phases (I and II) are covered. Phases III and IV will be undertaken and covered under another Memorandum of Agreement to be entered into in the future, probably upon completion of Phase II. A brief description of the four phases follows:

I. Preparation of the research design

A full research proposal or research design will be developed based on a review of the existing information, statistical and descriptive, of the provincial target city(ies), and the available literature on the relation of water supply systems to people and community welfare giving significant attention to valid measures of impact and meaningful categories of investigation. Further, it will entail field reconnaissance trips to the five provincial cities listed as potential survey sites and to the five cities to be chosen as possible control sites. During this phase, construction and pretesting of interview and observation schedules for Phase II will be undertaken. The detailed research design herein-mentioned will focus on and include the sites finally selected after the ocular inspection mentioned above, the interview and observation schedules, the work plan and the budget estimate for Phase II.

II. The baseline survey 1976

A baseline survey of the experimental and matched control sites in one or two cities will be undertaken. This will entail an assessment of the situation before the installation of the water supply system through a sample survey of households in the experimental and control cities taking into consideration the special sample groups; a measurement of the state of broader institutional areas; and a check-off of performance levels of the existing water supply systems.

An important feature of this phase will be the coding and data storage processes to ensure maximum retrieval for comparison purposes in the 1979 reevaluation study.

Along with the final report of the baseline survey hereinmentioned, which will indicate the situation of the people and communities involved in the experimental and control sites, will be a presentation of the Phase III design. This design will include a description of the guidelines, recording procedures, supervisory-administrative activities entailed, a tentative work schedule and project budget estimate.

III. Interim monitoring, 1976-79

Significant events and changes in the community which might later be associated with the impact measures of the water supply system will be documented and recorded. These activities will be undertaken immediately after the baseline survey (1976) and before the evaluation restudy in 1979 is conducted. A small staff of local residents to be trained and supervised by the IPC will carry on these monitoring activities. They will keep track of the progress of the water system installation and related events at various stages. This participant-observation approach is expected to allow more meaningful explanations as to why certain results shall have or shall have not emerged in 1979. Further, it will indicate any fluctuations in response during the interim period.

A report on the monitoring phase will show the major trend of activities and events and will introduce the manner by which the reevaluation study will be conducted. This report will also include a rough budget estimate and work schedule for Phase IV, the follow-up evaluation survey.

IV. Follow-up evaluation study, 1979

Using the same survey and other forms of investigation undertaken in the baseline survey (Phase II), a follow-up evaluation survey will be conducted in 1979 in the experimental and control cities. It hopes to reveal the effects which shall have been presumably felt in the community three years after the installation of the new water system. The final report of the study (covering all the phases) will stress the impact both

in health and economic aspects, of the new water supply systems on the people and community of the participating provincial cities.

B. Specific Tasks

The specific tasks covered by this agreement are to undertake Phases I and II of the study over an accumulated period of one year (Phase I - 4 months, Phase II - 8 months). The tasks in each phase are as follows:

1. Phase I. Preparation of a research design

- a. To design a specific research proposal that will be used for Phase II, based on a review of the existing literature and field visits to the proposed research sites as described in Phase I description in item IA.1 above.
- b. To submit to the LWUA a draft research proposal in five (5) copies in typescript at the earliest three months or no later than five months after the execution of this Agreement, or at a date mutually agreed upon by the LWUA and the IPC. The LWUA shall return this draft proposal to the IPC within a week's time after receipt thereof, with comments, if any. The IPC shall make the necessary revisions, if any, and submit the final proposal in five (5) copies in typescript within a week after receipt of the LWUA response.

2. Phase II, Baseline survey, 1976

- a. To conduct a baseline survey in one or two cities based on the specifications presented in the research proposal designed and approved in Phase I.
- b. To submit an administrative progress report (in three copies) immediately after completion of data gathering, indicating significant situations encountered in the field and a brief description of how the data will be analyzed.

- c. To analyze the data gathered in this phase focusing on the impact of the installation of the water supply system focusing on the two main concerns, namely health and economic results.
- d. To submit a brief substantive progress report (in three copies) on the project showing some preliminary results of the data analyzed or where so requested and indicated earlier by the LWUA, preliminary findings on priority areas under negotiation.
- e. To submit a draft of the final report (in three typescript copies) of the study at the earliest 6.5 months after the start of Phase II or at the latest 7.5 months after or at a date mutually agreed upon by LWUA and the IPC. The LWUA shall return this draft to the IPC within a week's time after receipt thereof, with comments, if any. The IPC shall make the revisions reasonably called for and submit in mimeographed form ten (10) bound copies of the report within a period of three weeks after receipt of the LWUA response.

II. WORK PLAN TIMETABLE AND COVERAGE

The work plan and coverage specified in Section I. B. of this Agreement will be carried out by the IPC for an accumulated period of one year, allowing four (4) months for Phase I and eight (8) months for Phase II. Inasmuch as Phase II is dependent upon the results of Phase I, the launching of Phase II will be done only after the LWUA's approval of the research design resulting from Phase I.

The coverage of the study will be Tacloban City and possibly another city. Cagayan de Oro City is likely to be chosen as the second experimental city; however, Bacolod, Davao, and San Pablo cities may be considered as alternate second-city possibilities. The final choice of the area coverage shall be subject to discussion by the LWUA with IPC. The discussion shall be relayed in writing by the LWUA to the IPC before the launching of Phase II.

III. PROJECT COST AND TERMS OF PAYMENT

A. Project Cost

The preparation, survey, and other research activities involved in the study either for one city or for two cities as specified in Section I. B. above will be accomplished at a total fixed price as indicated below:

| | <u>One-city survey *</u> | <u>Two-city survey**</u> |
|-----------|-------------------------------|-------------------------------|
| Phase I | P 24,970 | P 34,612 |
| Phase II | <u>103,623</u> | <u>165,738</u> |
| Total | <u><u>P128,593***</u></u> | <u><u>P200,350***</u></u> |

*Tacloban City

**Tacloban city and another city

***The breakdown of the budget is shown in the attached schedule.

Provided, however, that inasmuch as Phase II is dependent upon the results of Phase I, the fixed cost hereinstated for Phase II will be subject to review after Phase I results emerge for possible increase or decrease. Provided further, that in view any change in the budget after a thorough review by the IPC, a revision of the Phase II fixed-price shall be duly negotiated, the results of which will be covered by a mutual agreement in writing to this effect and will be considered part and parcel of this Agreement.

The total price of the study hereincovered by this Agreement is not subject to any contractor's tax. A Taxpayer's certificate will be issued upon acceptance of this Agreement both by the LWUA and the IPC and prior to its notarization. This Certificate is to form part and parcel of this Agreement.

FINDINGS

Socio-cultural Profile

Based upon this methodology, the findings are as follows.

Davao City

Location of the project

The LWUA project area in this city is rather restrictive, in that it consists only of some 85 square kilometers--approximately 3.5 percent of the gross city area. This area consists mainly of territory along the southeast coast fronting Davao Gulf. The project area is similar to the extent of the present service area of the Davao Metropolitan Waterworks (DWW). It is wholly within the city and includes the Poblacion or city proper and all or portions of 12 barrios located adjacent to the Poblacion. The latter is the most intensely developed area of the city. All or portions of the following barrios are included within the study area:

| | |
|---------------|-----------------|
| Agdao | Matina Crossing |
| Buhangin | Pampanga |
| Cabantian | Panacan |
| Communal | Sasa |
| Ma-a | Talomo |
| Matina Aplaya | Tigatto |

The people

The people within the area LWUA has designated for the project claim roots in the Visayas. Their presence in this city dates back to post WWII immigration to Davao which has been receiving migrants from other islands nearby for a long time. Prior to the coming of recent immigrants, the area that is now Davao City was occupied primarily by Muslim Filipinos. As migration increased they sold their land to the newcomers and moved out to the surrounding rural areas. Some later returned to the Poblacion as unskilled workers.

Note: This Socioculture Profile and Feasibility is quoted from a study of the five pilot projects (Loan 033) for LWUA by the Institute of Philippine Culture. The study is on file with ASIA/CCD. 'Social Soundness Analysis of the LWUA Project to Improve the Water System in Five Provincial Cities' Ateneo de Manila University, IPC, 1976.

The migrant nature of the people is obvious in the various languages that can be heard. One can hear Davaoeño among the old local families and among people in the rural part of the city; then Cebuano which is understood by most people in the poblacion, and Tagalog are the other languages spoken here. Waray, Ilonggo, and Ilokano are heard as well, and so is Chinese. English is understood by many of the people but is spoken mainly among those in the upper social class, and in official business transactions.

Despite differences in languages however, there is much intermingling between people in Davao. Exceptions among them are the Chinese and the Muslim Filipinos who tend to stay within their communities. The former congregate in a mini-Chinatown along the Sta. Ana pier (See Appendix B, Plate I). This Chinese community is also known as the city's commercial center for inexpensive textiles and for Chinese food. The Chinese customarily live on the second floor of their clothes and textile stores, and are considered by many as the "rich people" of the city. In addition to having a defined residential area, the Chinese also have their own school, the Davao Central High School. The Muslim Filipinos on the other hand, occupy a particular strip of land along the Davao Gulf shoreline. It is commonly believed that the local Muslim Filipinos here are not "trouble makers." However, particular inter-cultural prejudices such as inferiority, and laziness attributed to the Muslim Filipinos strongly influence the noninteraction of Muslims and Christians of Davao in the study area.

Another notable aspect about the people in the City is that a large number of them are squatters. These are people who reside on public property. The 1974 census shows that 1,764 families, or 1/7 of the total 1970 population count, of 12,000 families are squatters within the project area.⁴ Notwithstanding the assumed population increase within the four year period the squatter population ratio is still relatively high. The city government has a plan to relocate the squatter families to Bago Oshiro located within the city limits.

Economy. The area around the poblacion is rich in natural resources. Fertile soil and favorable climate, ideal for raising various fruit crops, make farming a natural means of livelihood. Large quantities of bananas, rice, coconut, and corn are produced and are sold in the local markets, and to other markets throughout the country. Jobs related

⁴ City Planning and Development Board. A Feasibility Study of Squatters Resettlement Project at Bago Oshiro, Davao City. Davao City, 1975.

to agriculture are most common, similar to the national level, with 51 percent of the economically active population involved in it. Agriculture includes livestock and poultry raising as well as fishing from the surrounding sea and from the 72 hectares of fishpond area in the vicinity. The fishermen of Davao, using commercial fishing boats and motorized bancas, caught a total of 16,670 metric tons of fish in 1973. Others make a living in the service occupations, e. g., medical, transport, and communication services, which make up 24 percent of the city's work force. Workers in industry comprise 10 percent of the city's labor force, while 9 percent support themselves in commercial activities. The rest earn their livelihood in various types of jobs which do not fall under the above mentioned categories.

From these sources of income, an estimate of family income distribution in Davao City may be seen in Table 1.

Table 1. Estimated family income distribution, Davao City^a

| Range of monthly family income (Pesos) | Classification | Percent of total families in classification |
|--|----------------|---|
| Below 250 | Low | 35 |
| 250-800 | Middle | 60 |
| Over 800 | High | 5 |

On the other hand problems of unemployment and underemployment prevail. In 1960, an estimated 6 percent of the population was unemployed, while 19 percent was underemployed. Ten years later the percentage of unemployment rose to 8 percent while underemployment soared to 23 percent. Obvious here is that underemployment is

^aBased on salary survey of 4,169 wage earners of Davao City by Wilson-Montgomery project team in May 1972.

a more pervasive problem. Table 2 shows data from the Mindanao Regional Development Report (MRDP) on labor force trend estimates.

Table 2. Davao City labor force trend estimates (1969-70)

| Year | Labor force | Employed | | Unemployed | | Underemployed | |
|------|-------------|----------|-----|------------|----|---------------|-----|
| | | N | % | N | % | N | % |
| 1960 | 87,900 | 82,400 | 94% | 5,500 | 6% | 16,500 | 19% |
| 1970 | 152,980 | 140,959 | 92 | 12,021 | 8 | 32,239 | 23 |

Source: Mindanao Regional Development Report.

Figure 1 illustrates the trends in unemployment and underemployment in the city of Davao which shows that underemployment increases at a slightly steeper rate.

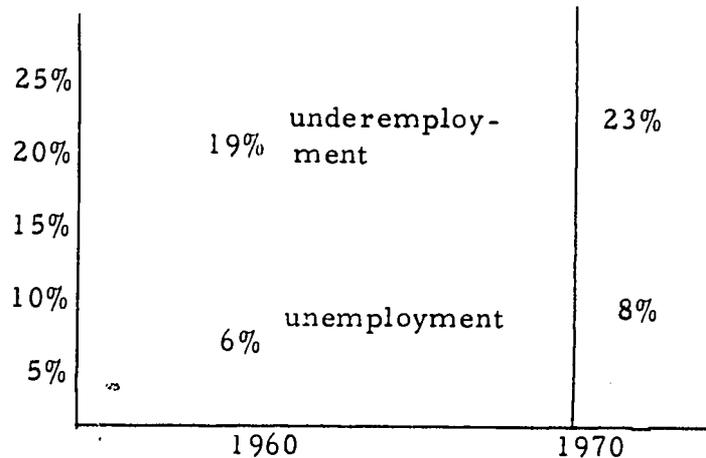


Figure 1. Unemployment and underemployment trends in Davao City.

Education. The residents of Davao seem to think highly of education. This is reflected in the student population which comprises over one-third of the entire population of the city. During the schoolyear 1973-74, there were 145,161 students, 36 per cent among the 400,000 residents here. About 65 percent (94,836) of the students are enrolled in government-owned schools utilizing 191 school

buildings and 3,210 public school teachers. Those who go to privately-owned institutions comprise 35 percent (50,325) of the student population. They are taught by 1,629 teachers in 97 school buildings. In addition, Davao has two well-known institutions of higher learning -- the University of Mindanao and the Ateneo de Davao. These evidences indicate that there are facilities accessible to the many people who are interested in education.

Health. Healthwise, however, there are certain threats, one of which relates closely to the LWUA project. Waterborne diseases are common. Table 3 shows that morbidity rates for all waterborne diseases in Davao City except gastroenteritis and schistosomiasis are higher than the rates of the Philippines as a whole.

Another threat to health is the perceived lack of needed minerals for maintaining healthy teeth in the drinking water. People here claim that they develop cavities faster and more frequently than others who do not live in Davao City.

Furthermore, the staff of the Davao City's health office which is responsible for administering the various puericulture centers in the city noted that those suffering from respiratory diseases, i. e., pulmonary tuberculosis and bronchopneumonia consult frequently in the clinic and comprise the majority of patients in the centers. A much needed X-ray machine was donated by the government of Japan but since there are no allotted funds for the services of a radiologist, the machine cannot be utilized and patients are deprived of its benefits. Inefficiency in the political bureaucracy is blamed for this situation.

Government. On the other hand leadership in the city government seem enthusiastic about their role. Although traditional practices of "palakasan"⁵ and petty corruption still exist, efforts have been made to upgrade the efficiency and professionalism among city officials. For example, the mayor, and 10 other city officials were recently trained at the Development Academy of the Philippines, an organization which aims "to promote and support the developmental efforts of the country."⁶ Recently the mayor chose 10 political/civic leaders of the

⁵The process of getting favor through kinship and personal friendship with those in a position of power.

⁶Measuring the Quality of Life; Philippine Social Indicators.
Development Academy of the Philippines, 1975.

Table 3. Historical incidence of waterborne diseases, Davao City¹

| Disease | 1966 | 1967 | 1968 | 1969 | 4-year average |
|------------------------------------|-------|-------|-------|-------|----------------|
| <u>Morbidity rates²</u> | | | | | |
| Cholera | 124.5 | 53.1 | 56.0 | 4.5 | 59.5 |
| Dysentery | 350.3 | 235.5 | 144.0 | 9.4 | 184.8 |
| Gastroenteritis | 520.5 | 648.7 | 324.2 | 296.8 | 447.6 |
| Infectious hepatitis | 43.8 | 30.9 | 19.7 | 29.2 | 30.9 |
| Schistosomiasis | 1.4 | 2.1 | 1.3 | 4.8 | 2.4 |
| Typhoid | 2.9 | 2.1 | 3.7 | 16.8 | 6.4 |
| <u>Mortality rates²</u> | | | | | |
| Cholera | 20.5 | 3.5 | 9.7 | 4.5 | 9.6 |
| Dysentery | 0.4 | 14.9 | 16.1 | 7.4 | 9.7 |
| Gastroenteritis | 27.5 | 39.2 | 45.2 | 85.2 | 49.3 |
| Infectious hepatitis | 1.4 | 2.4 | 1.3 | 1.0 | 1.5 |
| Schistosomiasis | 0.0 | 1.4 | 1.3 | 0.3 | 0.8 |
| Typhoid | 0.4 | 0.0 | 3.3 | 0.0 | 0.9 |

¹Data from Disease Intelligence Center, Department of Health, Republic of the Philippines.

²Per 100,000 population.

Table 4. Historical incidence of waterborne disease, Republic of the Philippines¹

| Disease | 1966 | 1967 | 1968 | 1969 | 4-year average |
|------------------------------------|-------|-------|-------|-------|----------------|
| <u>Morbidity rates²</u> | | | | | |
| Cholera | 21.9 | 6.8 | 10.5 | 7.8 | 10.8 |
| Dysentery | 66.0 | 51.3 | 53.1 | 37.2 | 51.9 |
| Gastroenteritis | 626.4 | 513.0 | 499.2 | 661.8 | 575.1 |
| Infectious hepatitis | 8.2 | 9.2 | 9.6 | 12.3 | 9.8 |
| Schistosomiasis | 9.1 | 7.1 | 7.6 | 7.4 | 7.8 |
| Typhoid | 0.8 | 0.8 | 2.0 | 4.4 | 2.0 |
| <u>Mortality rates²</u> | | | | | |
| Cholera | 1.7 | 0.6 | 0.8 | 0.5 | 0.9 |
| Dysentery | 4.0 | 3.0 | 3.7 | 3.4 | 3.5 |
| Gastroenteritis | 55.8 | 43.5 | 41.2 | 41.0 | 45.4 |
| Infectious hepatitis | 0.9 | 1.1 | 1.2 | 1.3 | 1.1 |
| Schistosomiasis | 1.4 | 1.6 | 1.3 | 1.2 | 1.4 |
| Typhoid | 0.4 | 0.5 | 0.7 | 1.1 | 0.7 |

¹Data for Disease Intelligence Center, Department of Health, Republic of the Philippines.

²Per 100,000 population.

city to tour some cities in Luzon in order to observe how the other leaders function in each of their spheres of specialization, e. g., agriculture, barangay, etc.

Davao also has a unique political organization which was organized by the incumbent mayor presumably to enable him to govern the city with greater efficiency. To begin with, in the Philippines, the task of governing the city rests on an elected mayor together with the city council. Davao's city government however is organized in the following manner. There are four main districts aside from the poblacion. These districts are headed by their respective deputy mayors personally selected by the mayor whose offices function as extensions of that of the mayor. Within each district and directly under the supervision of the deputy mayors are ten barangays. The barangay is the smallest unit of political organization in the city. The poblacion is divided into four smaller areas administered by cabeza mayors also personally selected by the mayor. Similarly, ten barangays fall under the supervision of one cabeza mayor. This structure however will soon be replaced by the Sangguniang Bayan, a political organization to be composed of the members of the existing city councils including the vice mayor. Inference may be made from this about the extent of people's involvement in social affairs.

Associations. In addition, there are socio-civic professional and religious associations in the city. The numerous professional associations suggest that there is a highly educated citizenry here. It can also be inferred from the number of various other associations the extent of people's involvement in social affairs.

Religion. Since the majority (89 percent) are Roman Catholics the bulk of religious activities are initiated by the various Catholic church-related associations, i. e., Barangay ng Birhen, Legion of Mary, Cursillo. The elected officers of the "kapunongan" or chapel associations often function as organizers to help in the development of their communities. In many instances, the kapunongan itself is used as a meeting place where discussions of the community's problems are held. Other kapunongans are converted into multi-purpose centers where domestic as well as agricultural skills are taught. Still others are transformed into classrooms, places for recreation, and even to a funeral-parlor, depending on the community needs at any particular time. It is worth noting here that the church hierarchy as a whole, has also become a channel for the needs of the poor to be aired to the proper authorities. This may be a consequence of the general concern of the Church for the welfare of the people.

Recreation. The people of Davao are not satisfied with merely earning a living. They also find time to enjoy the pleasures of life. Bowling alleys, pelota courts, volleyball courts, and billiard halls are regular hangouts for the sportsminded who can afford the fees for the use of such facilities. Movie houses show Tagalog and English movies which attract people from every social level. It is mainly the hundreds of male aficionados that flock to the large dome-shaped sabungan (cockpit) of the city for the weekend cockfights. Some people go to the numerous beaches, visit scenic spots. Residents out for an evening stroll are a common sight in the well-light plaza by the San Pedro Cathedral. Sometimes, public celebrities and other visitors are honored and introduced to the people here during significant city occasions.

Summary

Migrants make up the majority of the population of Davao City. As a consequence of the abundant natural resources in the area, agriculture is the people's main source of livelihood. Industry and commerce follow. From their various sources of income, the majority (60 percent) of the families earned between ₱250-800 a month in 1972. However, unemployment and underemployment with rates of 8 and 23 per cent respectively, are considered problems. The literacy rate is high at 88 percent, and numerous educational facilities are accessible to the people.

The city government structure here differs from those of the other cities in the country. Citizen involvement in socio-civic affairs is commonly channeled through various associations.

In general, the people of Davao are characterized by a pioneering spirit borne out of their migrant nature.

Sociocultural Feasibility

The compatibility of the project with the sociocultural environment on which it is to be introduced is based upon observable reciprocal relationship between the people and the project. It is assumed that this relationship would reflect attitudes, values, beliefs, social structure and organization wherein obstacles, as well as social features advantageous to the project may be identified. These are factors that should

be taken into account in fulfilling the objectives of the project.

Certain problems beset the people of Davao City. One of these which relates to the LWUA project, is the problem of inadequate water service. The existing DMW pipes serves only a small portion (10 percent) of the population.

Water from these pipes is primarily used for cleaning, e. g., washing clothes, dishes, bathing. It is considered "too dirty" to drink. The generally accepted belief here is that amoeba-related diseases prevalent among those in the lower class reported in the city hospitals are due to drinking this unclean water. Those who are aware of the watergerm-disease relationship therefore see to it that their children take their own drinking water to school. In the homes, rainwater is regularly collected in storage tanks located near the house. This water is used for drinking. It is fortunate that the rainfall is frequent and predictable throughout the year. For example for the 23-year period (1949-1971) the average annual rainfall was 1870 mm (74 inches). Still people easily remember the drought that swept through Mindanao which left them without drinking water a few years ago. It was at this time that a source of potable underground water was discovered, in Dumoy, on the outskirts of the city. The more affluent residents purchased their drinking water from merchants who delivered Dumoy water by truckloads to the customers. One full tank of water, about 1,000 gallons, costs ₱40. Dumoy water is considered good for drinking because it is "clear, cool, and clean." An ad interim pipeline provided by the Urban Water System of Davao presently supplements the original source of water supply within the project area. Those who benefit from this seem satisfied, while the others are envious about such an advantage. This is a noteworthy situation because of the people's skeptical attitude about a proposed water system prior to the establishment of the local water district. The skepticism was born out of unfulfilled promises to improve the existing water system by a succession of mayors. "Twenty years ago, they were already talking about water," claimed one key informant. Another expressed pessimism about the proposed project. It seemed logical then that the members of the city council should oppose the proposed project when it was initially presented to them. It was the current mayor who was supposed to have "convinced" the members of the council to pass the proposal.

Even then, such attitudes of pessimism and skepticism may be identified as possible obstacles to the complete acceptance of the project design. Participation of those for whom the project is directed

cannot be expected to come easily if they look upon it as another empty promise. Other obstacles may be traced to the groups of people whose vested interests, resulting from the inefficiency of the present water system, might be adversely affected by the project. Among these are the following:

1. Owners of land on which there is free flowing water other than what is in Dumoy.

These people take full advantage of the public's need for quality water by engaging in business to sell what is flowing in their land. The profit seems very lucrative -- ₱3000/month claimed one key informant.

2. Dumoy businessmen

Fetching and delivering water from the city government-owned Dumoy wells to the customer has turned into a healthy, thriving business for some local citizens.

3. Drilling well companies

These companies provide service by drilling wells, and by offering electrical pumping systems that bring water to where they are needed in private homes, agricultural lands, and local industries.

4. Young people among the poor

This group ferries water in cans by cartloads from Dumoy to the customers' homes earning ₱1.50/can.

Changes, as the introduction of the new water system, would be a threat that is bound to take these gains away. Unless, new, equally rewarding, and tangible replacements are provided, it seems logical that they would resist the project and create means to block its success.

On the other hand, one can look at the people of Davao as a whole and from them find positive social features which can enhance the success of the project. From the high rate of enrollment in the numerous institutions of learning here, one can infer that there are many who are highly educated. The literacy rate is 87 percent. The leaders also seem to be

intelligent and open to innovation. This is reflected in the effort to have city officials trained at the Development Academy of the Philippines, and have them learn from the experience of leaders in the other cities. The uniqueness of the City's political organization planned by the incumbent mayor attests to the innovative spirit that prevails here. The same enthusiasm to accept and try new ideas is observable in the Kapitan Monteverde School, the largest in the Poblacion. Here, academic experiments by the teachers are being tried in order to test the capabilities of students to learn outside the classroom with only specific assignments to guide them.

That the people are mainly immigrants or descendants of past immigrants to the city may be an advantage as far as the project is concerned. Still without deep psychological roots in the city, it may be less cumbersome for them to incorporate changes in their way of life. If the project can make jobs available, the unemployment problem might be reduced. That those who now benefit from the ad-interim pipeline are satisfied, and are already objects of envy by the less privileged suggests that any effort to make quality water readily available to more people is bound to be welcomed.

TABACO (1)

An Overview of the Community

Tabaco is a municipality of Albay, a province in the Bicol Region. The town is located 550 kilometers south of Manila. It is bounded by two other Albay towns, Malinas and Malilipat, as well as the perfect-coned Mayon Volcano and Tabaco Bay. The town covers a total geographical area of 190 square miles or 12,210 hectares.

The recorded history of the town began in 1587 under the auspices of the Franciscan Fathers. Their first appointed minister built a church and dedicated it to St. John the Baptist, who to this day has remained the town's patron saint. In later years, the town experienced a succession of Spanish, American, and Japanese colonization as well as natural calamities like the eruption of Mayon Volcano in 1814 and, more recently, a big fire in 1964. Tabaco has managed to survive through all this and now enjoys relative peace.

From Manila, Tabaco can be reached by bus or train. Travel within the town is facilitated by tricycles, jeepneys, and buses. The last is also used to get to other towns. To reach the island-barrios of Tabaco motorized bancas and barges are available. In addition, the town's seaport accommodates cargo and passenger vessels.

Communication facilities in the town include a telephone company, four telegraph offices, a messenger service, and a post office. Tagalog and English newspapers, magazines, and comics enjoy a wide circulation in the town proper.

The commercial establishments existing in the town are two markets, 450 sari-sari stores, 13 groceries, six bakeries, six department stores, eight drugstores, five hardware stores, nine gas stations, six auto-repair shops, five lumberyards, two rice and corn mills, and one shipyard. There are also four banking institutions as well as a cooperative and credit union. A great majority of the establishments enumerated above are found in the poblacion rather than in the barrios.

(1) Socioeconomic Profiles of Six Selected Towns Report submitted to Camp Dresser and McKee International, Inc. by the Institute of Philippine Culture on 25 February 1976, Ateneo de Manila University Institute of Philippine Culture, Quezon City, 1976.

For pasttime activities young and old residents flock to the town plaza. Other recreational facilities consists of four movie-houses, several billiard halls, cockpits and courts for basketball, volleyball, and tennis. There is also a small town library for quiet leisure activity and two nightclubs for evening pleasure. Accommodating visitors to the town are five lodging places, of which two form part of beach resorts.

Several government extension offices render services and assistance to the townspeople. Among these are the Department of Local Government and Community Development (DLGCD), and the Department of Social Welfare (DSW), the Rural Health Unit (RHU) and the Bureau of Agricultural Extension (BAE). A police force and fire department which emerged, of late into a single unit, maintain peace and order.

Tabaco is primarily an agricultural area. Its major products are abaca, copra, and corn. Its minor crops include coffee, cacao, citrus fruits, rootcrops and caragunoy. Traditional farm implements are utilized by many farmers in the municipality. However, modern technology in the form of tractors, weeding chemicals, machine blowers, and milling machines are fast gaining acceptance among farmers.

Demographic Profile

At present, 47 barrios and a poblacion compose the town of Tabaco. Six of these barrios are located in the island of San Miguel, about ten miles from the mainland.

According to the 1970 census data, there were approximately 60,504 people (8 percent of the total provincial population) living in the town. Of this number, 7,567 or 11 percent resided in the town proper while the remaining 52,937 or 89 percent lived in the barrios. The town had 9,653 households with an estimated six persons to one household.

Ninety-eight percent of the town residents speak Bikol, the regional language of the Bicol area. This is used in social and commercial intercourse. The rest (2 percent) speak other languages like Tagalog, Pampango, Samar-Leyte, Cebuano,

Maranao, Iloko, Spanish, Hiligaynon, and Chinese. Almost all of the people in Tabaco (99 percent) are Roman Catholics. This is largely due to the fact that for many years, the town was under the administration of the Franciscan Fathers. Other religious groups, however, coexist with the Catholics. These include the Iglesia ni Cristo, Jehovah's Witnesses, Bible Baptists, Evangelical Seventh Day Adventists, and Buddhists.

Though the province of Albay has been considered an out-migration area (net migration for 1960-70 was -37,035, DAP Task Force on Human Settlements 1974) Tabaco residents in particular seem to maintain relative permanence in their place of residence. Census figures show that in 1970 most of them had maintained residence in the same municipality for 5 years or more.

Socioeconomic Features

Health

The town's death rates for 1970 and 1972 are higher than the national averages for the same years. In 1970, Tabaco's death rate was 11 per thousand as against the lower national rate of 6 per thousand. Two years later, it registered the rate of 12 per thousand or a figure still higher than the country's 7 per thousand. No infant mortality rates are available for the town.

The health facilities of Tabaco consist of four hospitals, 14 clinics, two RHU's, one puericulture center, three family planning clinics, and five dental clinics. Health services are rendered by 26 doctors, 7 nurses, 8 licensed midwives, 30 hilots, and 7 assistants. Other practitioners of health-related professions include five pharmacists, three optometrists/opticians, two sanitary inspectors, one dietician, three nutritionists, and one medical technologist. Medical cases that these health facilities and practitioners cannot handle, are referred to Legaspi City, the provincial capital, or to Manila.

Education

Tabaco's literacy rates are definitely higher than those of the entire country. In 1960, the town's 79 percent was higher than of the country average of 72 percent. The town's rate rose to

90 percent, again a figure higher than the national rate of 83 percent.

In spite of the encouraging picture presented above, Tabaco's adult population with at least an elementary education amounted to only 34 percent or 8 percent lower than the national average of 42 percent.

The town has a total of eight schools which altogether offer courses ranging from elementary to college as well as vocational education.

Municipal income

The average income of Tabaco for four fiscal years, 1967-1970, was estimated at ₱496,000. Thus, the Department of Finance has classified the town as a First Class-6 municipality.

Employment

In 1970, the town's economically active population was 20,197, of which 1,434 (7 percent) were employed. Against the national unemployment rate (8 percent) Tabaco's unemployed force was comparatively smaller.

In 1970, census figures provide the following breakdown of the employed work force according to the type of occupation they engaged in: thirty-one percent were craftsmen, production process workers, and laborers; 27 percent were farmers, fishermen, hunters, loggers, and related workers; and 13 percent were sales workers. Service, sports, and related workers made up 9 percent of the employed; both workers in transportation and communication and professional, technical and related workers comprise 6 percent each; while stevedores and related freight handlers comprised 4 percent. Administrative, executive, managerial, and clerical workers, and others comprised the remaining 4 percent of the employed work force of Tabaco.

Housing

The single-detached house is the dominant dwelling structure in Tabaco as elsewhere in the Philippines. In 1970, 94 percent of the town's buildings were of this type as against 89 percent for the nation. Barong-barongs, duplex type houses and commercial type buildings comprise the remaining 6 percent of dwelling units in Tabaco.

The predominant type of construction material in the town as of 1970 was wood. Almost two-thirds (68 percent) of dwelling units in the area were made from this material. Bamboo (18 percent), nipa (11 percent), and concrete (7 percent) were also utilized though to a more limited extent. Other construction materials like galvanized iron accounted for the remaining DUs.

Tabaco's pattern of greater reliance on wood and other similar materials, i. e., bamboo and nipa, parallels that of an average Philippine town.

Viewed from a different angle, a majority of Tabaco homes (56 percent) may be classified as built of a combination of strong and light materials. Roughly one-fourth (24 percent) are constructed mainly from light materials, and about one-fifth (18 percent) are made from strong materials. Compared with Philippine figures, Tabaco homes emerge as being built less of strong and light materials, but more of the combination of these two types of materials.

Housing Utilities

Water

Piped water was the main source of water for Tabaco residents in 1960 and 1970. In the latter year, 57 percent of the town populace enjoyed this convenience. This is an outstanding record when compared to the 1970 Philippine figure of 24 percent.

Pumps constituted the second main source of water in Tabaco in 1970. Ten years before only a mere 5 percent utilized this. In 1970, however, this figure jumped to 15 percent. Compared to the national figure, (30 percent), however, Tabaco's 15 percent is much lower.

Springs were the third major source of water for Tabaco residents. In 1970 more than one-tenth of the population in Tabaco, and also in an average Philippine town (11 percent for both) relied on it for their water.

Nine percent of the Tabaco townsfolk drew water from open wells, while 8 percent did so from artesian wells. Other natural resources like lakes, rivers, streams, and rain were utilized by less than 1 percent of the town's populace.

In brief, a comparison of statistics on sources of water supply in Tabaco and the average Philippine town shows that Tabaco makes more use of piped water and less use of every other source of water, except the spring. Tabaco relies on this last source as much as an average Philippine town does.

Toilet facilities

Toilet facilities in Tabaco are sadly lacking. One-half (50 percent) of the town residents do not have this item. Though this problem was more severe in 1960 (71 percent had no toilets) the decreased number in 1970 still reflects a sore need. Even when compared with the national figure (37 percent) Tabaco still fares unfavorably in this aspect.

Among those who possessed this facility, however, the most common type was the open pit (20 percent), followed by the flush type (15 percent). Slightly over one-tenth (11 percent) utilized the Antipolo type, while 5 percent still ran to public toilets.

Cooking fuel

A strong preference for wood as cooking fuel is manifested by Tabaco residents. Eighty-six percent of the townsfolk utilized this item in 1970. In the same year, kerosene, the residents' second choice, was used by about one-tenth of the population (11 percent) for cooking purposes. On the whole this pattern is reflected by the national figures, although the latter also shows more utilization of other types of cooking fuel, like LPG and electricity.

Summary

To summarize, the municipality of Tabaco is primarily an agricultural area, although signs of urbanization are beginning to appear. This transition phase is seen in the occupations engaged in by the townspeople. Craftsmen and production workers and agricultural workers comprise the two major occupation groups. While traditional methods for farming are still maintained, modern implements may now be seen in Tabaco farms. Piped water is a convenience enjoyed by a majority of the town residents. On the other hand, more and better toilet facilities are still lacking. Electrical service, while available in the town, is limited to only 17 percent of the population. This fact could account for the small number of electrical appliances present in the community. Wood appears to be the major cooking fuel in Tabaco.

Health facilities in the town appear inadequate. This may be responsible, in part, for the high mortality rates for 1970 and 1972. Though the town's literacy rates are encouragingly high, the educational attainment of its adult population still falls below that of the national figures. Finally, its relative low rate of unemployment suggests that as regards employment problems, Tabaco fares better than an average Philippine town.

POSITION & ORGANIZATION CHART
LOCAL WATER UTILITIES ADMINISTRATION

Approved under LWUA
Board Res No 7-75
As of Sept 9, 1975

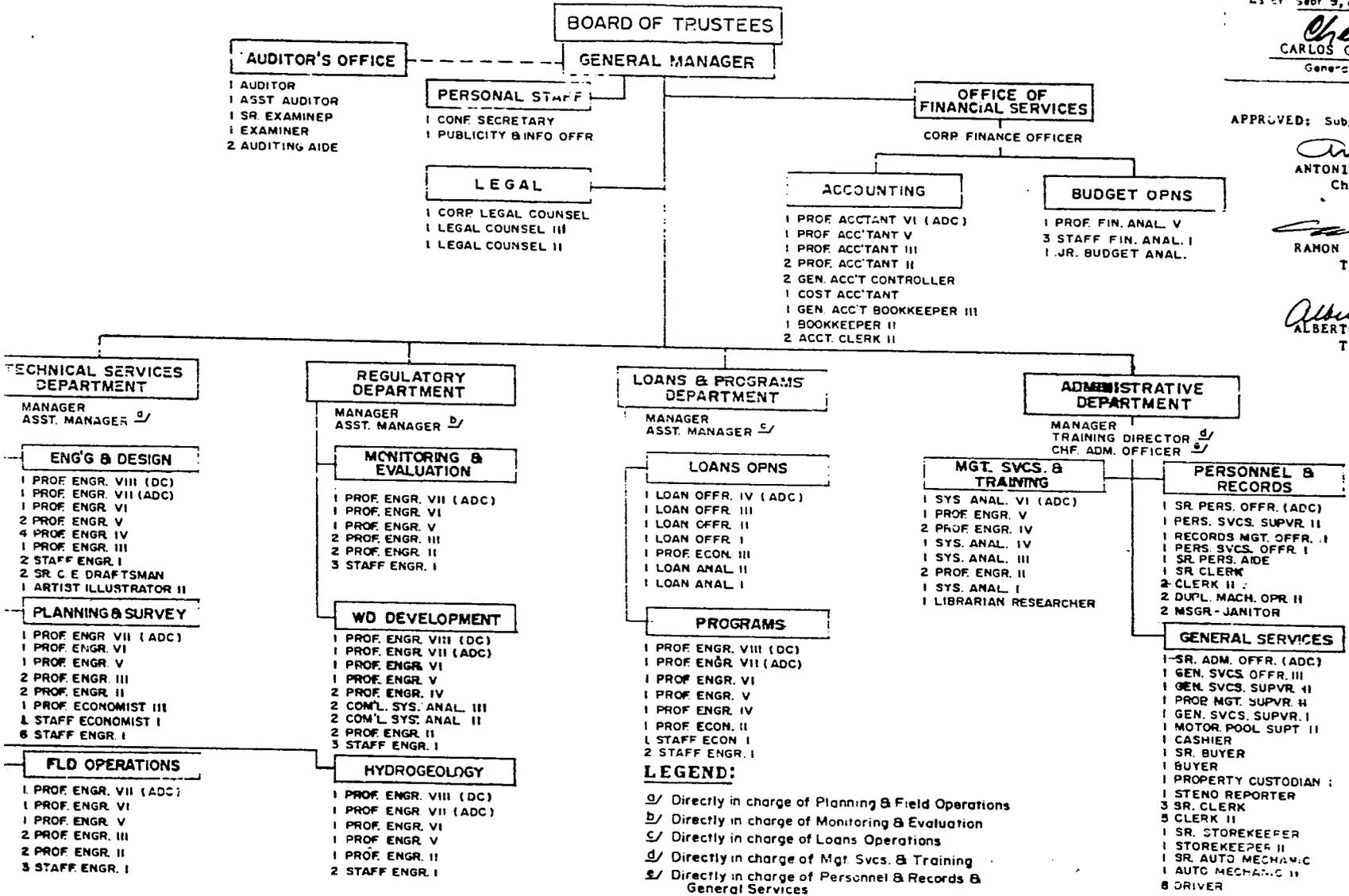
Carlos C. Leano, Jr.
CARLOS C. LEANO, JR.
General Manager

APPROVED: Subject to*

Antonio M. Locsin
ANTONIO M. LOCSIN
Chairman

Ramon B. Cardenas
RAMON B. CARDENAS
Trustee

Alberto R. Sanchez
ALBERTO R. SANCHEZ
Trustee



LEGEND:
 a/ Directly in charge of Planning & Field Operations
 b/ Directly in charge of Monitoring & Evaluation
 c/ Directly in charge of Loans Operations
 d/ Directly in charge of Mgt. Svcs. & Training
 e/ Directly in charge of Personnel & Records & General Services
 DC Division Chief
 ADC Asst. Division Chief

ANNEX R

Deficiencies in Water Systems

All systems observed had deficiencies. A general discussion of major deficiencies follows:

A. Lack of Water

1. Quantity of Supply

With four exceptions (Boac, Dagupan, Dingle and Virac) all cities surveyed suffered some degree of water shortage that ranged from low pressure at distribution extremities to no piped water system whatsoever. Statistically less than 50% of the systems had adequate water supply sources that could meet 1975 maximum day demand providing water to all persons residing in the service area. In reality water delivered to the service area was considerably less than the potential sources could provide because of defects in transmission lines, curtailed water system operating hours, and simple disappearance of water for undetermined reasons. Again much water that should have been available for use was lost because of continuously running faucets. In some cities portions of the service areas have not yet been provided with distribution piping. In other cities consumers did not receive water because pipelines were just too small. In several systems adequate water is available during the rainy season but not during the dry season.

2. Hours of Supply

Hours of supply were below standard for most cities with service ranging down to zero hours where the system was out of operation. Generally only those with gravity supplied systems had 24 hour service. Some cities had areas where service was provided for 2 hours a day and 4 hours a day while many had 8 hours service although with very low pressure. Several cities were forced to ration their water by valving off portions of the service area at different times of the day. By count of 106 systems, only 48 had 24 hour water service, and 9 had service for 4 hours a day or less.

B. Water Quality

The limited time available to the survey teams and lack of proper water testing equipment precluded the collection of much data on water quality. With five exceptions (highland sources that tapped streams

draining outcropping lava rock) surface sources were generally so turbid that they must be classified as unpotable, and during heavy rains they become rather muddy. Moreover surface sources were often subject to contamination from people living within the watershed areas, who are known to bathe and wash clothes upstream of the municipal water supply intake pipes. These surface sources were used practically without treatment, with few exceptions. Many spring sources observed yielded good quality water, but in some cases were not properly protected against surface run-off entering the intake structures. Several springs were from limestone aquifers which are considered unsafe unless chlorinated. In only 4 instances of 44 systems using chlorine was good disinfection being obtained.

During the survey, water taken from the sources and systems were tested for conductivity which indicates the salinity of the water. Nearly all water taken from spring sources was of good physical quality, based on conductivity. Most well water sources were also of good physical quality but about 10% of the wells had excessive salinity and some had excessive iron. As to bacteriological quality, many cities reported negative coliform tests, but some positive B-coli tests were reported. In most cases, it would not be advisable to drink water from these water systems without prior sterilization, in view of the low pressures which may allow polluted water to enter the distribution piping, even though well waters tend to be of good bacteriological quality when pumped from the ground.

Excessive chlorides (exceeding the 500 ppm standard of the Philippine Department of Health) are now a problem in 12 waterworks system, and may become a more serious problem if new deepwells are installed and pumping hours are increased.

C. Transmission Mains

Transmission mains are those pipe lines delivering water from the source to the distribution piping system. In some instances this may amount to only several hundred meters between a pumping station and the nearest distribution line. In other cases the transmission line may originate in some distant barrio as in Calbayog, Samar where the transmission line extends 31 kilometers from the core city to a mountain stream, and as in Iloilo City, Iloilo where the river source is located some 30 kilometers away.

The major defect noted was that these lines were almost always undersized for current water needs. In most cases the water available at the source far exceeded the capacity of the transmission lines. In most instances transmission mains were installed over 20 years ago and were designed to serve a fraction of the present population.

Another serious problem is installation of these pipe lines above ground. This has resulted in rapid deterioration of the pipe, extensive leakage, major pipeline breaks caused by shifting ground conditions, illegal taps, and occasional acts of vandalism. Transmission lines making surface crossings of rivers are particularly susceptible to breaks and some get washed away each year during the rainy season.

A problem particular to transmission lines from highland sources and springs is that the computed carrying capacity often exceeded the actual water delivered. No flow tests were made but inspection of these lines generally found a probable cause for the reduced yield. These included silt and mud lining of the inside of lines reducing the effective diameter, reduction of carrying capacity due to air binding caused by insufficient air release valves, reduction of carrying capacity produced by supercritical flow where pipelines are laid down steep slopes, the need for a greater number of blow-off lines to flush out accumulated pipeline deposits, and badly designed or badly maintained intake facilities. Intakes at surface streams often consisted only of galvanized mesh screen wrapped around a perforated pipe. In a number of instances these needed cleaning, but some were practically inaccessible.

Defects noted also include badly maintained and badly repaired pipelines generally attributable to lack of funds, equipment and particularly to lack of proper repair parts. This often led to replacement of sections of transmission piping with smaller diameter pipe, frequent use of "inserts" (breaks repaired with smaller diameter pipe inserted in the larger line) and frequent use of wire, tape and wooden plugs for repair of small leaks.

D. Treatment

Of the 110 waterworks systems surveyed only three (Olongapo, Roxas City, Malaybalay) had more or less complete water treatment plants. Another six had settling basins, or sedimentation tanks, and seven including Roxas City had infiltration galleries.

None of the settling basins are provided with mechanical cleaning equipment.

Infiltration galleries generally consist of perforated concrete pipe bedded in gravel and installed alongside river channels except in the case of Iloilo where the pipe is laid right in the river bed. Of the seven infiltration galleries in use only Iloilo, Batac and Oroquieta produce clear water. The Roxas City facility and a similar one under construction in Dipolog are built in areas consisting largely of silt and clay deposits. To offset the impermeability of the river bed material separate stone lined structures have been excavated parallel to the river and filled with graded sand and gravel. Surface water is conducted to the top of these galleries. This type of gallery will have operational problems.

While many municipalities claimed to chlorinate their water such treatment in almost all cases was ineffective, mainly because the dosage was insufficient. The reason given for the low dosage was usually the high cost of chlorine. It was apparent that few waterworks personnel understand the principles involved. Testing for residual chlorine was not done, with few exceptions. When hypochlorite powder was used it was usually suspended in water in a can and periodically dumped into storage tanks. Chlorine gas when used was usually fed to pump intakes, but without control valves or scales or even any type of gauge, and with no regard to variation in water flow. General response to questioning about frequency of chlorination varied between "each day", "every other day", "once a week", "only during the rainy season", or "whenever chlorine is available".

E. Distribution Piping

1. Piping network - The piping network was undersized or without sufficient coverage of the service area for every city visited. For most systems, distribution piping includes long lengths of 75 mm, 50 mm and even 25 mm pipe all of which are too small for effective distribution. Again in many cases lateral mains are dead ended rather than looped back into the system.

Another problem that will pose serious difficulties with future increased pressures is that pipeline repairs were often noted to be made with tape and wooden plugs.

It was not possible to determine the condition of most of the existing pipelines, but it seems probable that most systems will have troubles with new leaks, pulled joints and burst pipes when system pressures are raised.

2. Meters - Many cities were using few or no water meters. Overall it was estimated that about 30% of the connections had meters of which one-third were not working. The average meter use is so high because a number of systems meter nearly all connections in an endeavor to stop waste. Meters are advisable for commercial establishments and for consumers who abuse the flat rate system by letting the water run to waste or by selling water to other households. In one instance more than twenty-five households were found buying their water from one connected consumer, carrying it away by bucket.

3. Distribution Pressure - In view of the undersized distribution pipes and lack in quantity of supply, it is not surprising that distribution pressures are generally low. In some cities, some areas have adequate pressure only at times when few people are using water, such as late at night. In general, all systems have inadequate pressures throughout the system at times when most people want to use water. A count of 105 systems classed 43 as having low pressure everywhere, 49 as having partly low and partly high pressure and only 13 as having high pressure throughout.

4. Fire Hydrants - Fire hydrants for almost all systems visited were locally made, fabricated from 62 mm galvanized iron pipe (GIP), 62 mm gate valves and threaded fittings. Some cities have no hydrants; most have inadequate coverage and in most cases those hydrants inspected were inoperable due to faulty valves or caps which could not be removed. In several cases the waterworks personnel had no pipe wrenches to remove the caps, and in a number of other locations the hydrants were cemented closed in an attempt to reduce leakage.

In a few municipalities where there was time to conduct flow tests pressures were found to be so low that these fire hydrants could be considered of little use in combating any large fire even with a pumper type fire truck. In three municipalities officials told of the loss of entire central market districts because of the lack of water to fight fires.

5. Valving - It was not possible to get much information regarding distribution valves since most towns had no plans or records indicating the number and location of valves. Construction drawings when available generally indicated a large number of valves, but if they were installed they are now probably inoperative. Interviews with local staff indicated that good valves are too few for effective operation, and many or most of those existing are not functioning due to lack of maintenance.

6. Service Connections - The number of service connections was inadequate in each city visited.

There were in a number of towns large numbers of unauthorized connections, or situations where one authorized connection serves several households while the water district collects for only one flat rate charge.

Another service connection problem that may account for the apparent excessive use per registered connection is the general acceptance of households with pumped connections. This permits the user to connect a pump to the distribution system thereby assuring this particular customer of more water for a nominal increase in charge while depriving others connected to the same water pipe line.

In many cities it was observed that service connections were run through and alongside drainage ditches filled with polluted water.

Other defects include lack of corporation stop, extreme lengths of some service lines needed to reach distribution piping, multiple taps on a single service line (illegal connections), and use of inferior type faucets.

F. Storage

Concrete storage tanks have been constructed in the majority of the cities surveyed, but in a third of the cases are not used because consumer demand takes all the available water. In most other cases the storage tanks are soon emptied in the morning. Resultant reduced pressures prevent filling the storage tanks unless the waterworks personnel valve off the distribution system to permit partial filling of the tanks during the early morning hours. Most elevated and ground level reinforced concrete tanks appear structurally sound. A number of trapezoidal shaped, open reservoirs, constructed with unreinforced concrete poured against earth embankment were seen. Most appeared unserviceable because of multiple cracks in sides and bottoms. Storage tanks defects observed include the following:

- a) unprotected open tanks
- b) faulty or non-operating valves
- c) missing or non-operating level indicators on elevated tanks
- d) flooded valve boxes

G. Deep Wells

Most municipal wells are constructed of slotted steel pipe casing in diameters of 150, 200 or 250 mm, with 150 mm casing being the most common. No known gravel packed wells were encountered in municipal service. While few well logs and construction diagrams were found, data from the Bureau of Public Works, Wells and Springs Services together with field inspection led to the following general observations:

1. There are numerous instances of reported well collapse. Probable cause of this is the common practice of not installing well screen or slotted casing in the production zone when in the opinion of the contractor the bore hole will remain open. It is not known whether this is done for purposes of economy, or to allow for unimpaired flow into the well.
2. The steel pipe casing appears too thin walled to withstand corrosive groundwater conditions should they exist.
3. The slots provide very little area for entry of water into the well.
4. Use of 150 mm casing limits the size of pump which can be installed to about 6.3 lps even if the well is capable of producing more.
5. Of all deep well installations surveyed only one was provided with an inspection well to permit analysis of aquifer characteristics. Such data is needed to determine the advisability of cleaning or otherwise reconditioning the well.

H. Pumping Equipment

The major defect of pumping facility installations observed was that there was no access to any of the wells to allow for static and pumping water level measurements, nor could any well depths be confirmed. Water level measurements are needed to determine the efficiency of both the well and pumping equipment, and to establish safe yields by projecting measured drawdown. In several cases pumps were breaking suction which might have been caused by improper pump setting although this problem can also occur if the pump discharge exceeds the permissible well yield. It is however also possible that well yield could be increased by either a lower pump setting or installation of a larger pump unit.

Measurement of well depths might indicate partially collapsed wells if recorded data were appreciably less than that shown on construction drawings. Other installation defects often included lack of provision for making pumping tests, lack of air relief valves on deepwell discharge lines, lack of pressure gauges or allowance for their installation, and in several cases pump drive installations that were subject to flooding.

It was apparent that some pump installations were unable to meet the necessary head conditions to fill elevated storage tanks and provide adequate pressures at outlying distribution points. These pumps supply water at present low pressures. Improvement of the systems will require replacement of many of the existing pump units.

Operation and maintenance defects most generally noted were direct pump discharge into a low pressure distribution systems resulting in inefficient pump operation, inoperable or faulty shut-off valves (gate valves) and low line voltage. Almost without exception operation and maintenance records were inadequate. Often waterworks personnel were unable to recall when pumping equipment was last overhauled. Some units had been in operation without repair for 15 years or more. Reduction in rated capacity or of initial tested pump yield was, as expected, often found where present pump discharge could be determined. Some complaints of pump operators in regard to maintenance of pumping equipment was a) few if any spare parts provided with initial installation, b) inability to locate parts for old equipment, c) lack of funds to obtain parts, d) lack of operation and maintenance instructions, and e) lack of qualified personnel to make required inspection, adjustments, and repair.

I. Lack of Flow Measuring Facilities

Among all the water sources observed only one was equipped with a meter. The water systems surveyed generally did not know how much water they produced or where this water went. Reasonably efficient operations are difficult without such information.

**PROCEDURES FOR THE ECONOMIC AND FINANCIAL ANALYSIS OF
PROPOSED WATER PROJECTS, 100 CITIES OF THE PHILIPPINES**

The procedures developed here are designed to accomplish two major results. The economic analysis will provide a basis for comparing projects in terms of human needs for water and in terms of general public health and welfare in relation to costs. The financial analysis will compare communities to be served on their relative ability to operate and maintain their water supply systems, including the amortization of project costs used to improve the system. Use of the two approaches broadens the base for decisions as to allocation of funds among projects to the end that allocations will be based on more than the ability of a water district to meet its financial obligations.

ECONOMIC ANALYSIS

Economics is one of the social sciences. As such, it includes in its scope considerations of welfare. Thus, when capital projects are being tested by economic means, it is possible to look beyond purely monetary elements to so-called benefits. The question asked in a water supply project is not how much can the water users pay, but how much will they benefit from the development and what is the relationship of the benefits to the economic cost. Benefits to be considered include reduced sickness and death associated with inadequate and polluted water supplies, improved well being of the general citizenry and improved productivity and reduced lost time from work, reduced use of vital medical services needed for other purposes and implementation of national goals for economic and

social growth. The relationship of these benefits to the costs should be competitive with alternative investment opportunities.

Benefit-Cost Analysis and Internal Rate of Return - The basic economic tools utilized to evaluate the economic justification of the project include the determination of the benefit-cost ratio for each project and the calculation of its internal rate of return (IRR).

Benefit-cost procedures must concentrate on the comparison of project costs and project benefits, both viewed in terms of national interest. Because of the long life expectancy of most capital development programs and the period of time it takes for a project to yield all its beneficial effects, the comparison must cover a period of years. In these procedures a period of 30 years is used.

The benefits and costs are estimated for a study period of 30 years and reduced to lump sum values by use of the social value of money, taken to be 15 per cent. The lump sum values are related by dividing benefits by costs to secure a benefit-cost ratio. From the same data the net project benefit is obtained by subtracting costs from benefits.

The internal rate of return of the project is next determined by use of higher discount rates where the benefit-cost ratio is better than one when the social value of money is 15 per cent and by lower discount rate when the ratio is less than one. The actual rate is approximated by interpolation between the two discount rates before and after breakeven.

Benefits - Beneficial use of water for personal or household purposes is valued in terms of what people would be willing to pay rather than in terms of what they actually pay. In this regard, the customers willingness to pay is related to his total personal satisfaction received from better water service and includes general benefits such as reduced sickness and death, improved productivity, etc.

It is believed that ₦1.50 per M³ is representative of the 1976 beneficial value of water in the smaller communities included in the 100 cities. This is 50 per cent higher than the cost which it is believed could be borne by the marginal user. This difference is the so-called consumer surplus. It is the average value of water to users whose personal satisfaction in water use ranges up from the marginal user who pays ₦1.00 per M³ to the person who would pay ₦2.00 or more rather than do without. The 50 per cent difference is based on a bulk-line value which lies between the extremes likely to be found in actual market situations.

Commercial and industrial users consider water as a factor of production. They are estimated to be able to pay twice as much as the householder, or ₦2.00 per M³. It is believed that the range of difference between what the marginal non-domestic user pays, namely ₦2.00 per M³, and what the average businessman or industrialist would be willing to pay is less than the difference for personal and household use. The range of difference being narrower, the bulk-line representation is estimated at only 25 per cent above the

market price. This gives a beneficial use value of ₱2.50 per M³.

Benefits from the reduction of fire losses are estimated at .75 per cent of structural values. Thus, if the average value of a structure, whether a house or a business establishment, is ₱20,000, a good water supply would create a saving in 1976 pesos of ₱150 per year per structure.

Benefits to the nation which exceed the benefits to water users and to owners of properties less subject to fire loss are based on an analysis of current characteristics of communities. Based upon factors and weights given them, direct water district benefits are adjusted upward by 5, 10, 15, or 20 per cent.

Costs - Projects usually take several years to complete. Actual construction takes place one or more years after preliminary cost estimates are made. Thus, construction costs must be scheduled by year of likely construction and inflated or escalated to reflect the passage of time between cost estimates and the mid-year of each construction year.

Operation and maintenance costs must be estimated and programmed to start in the year following construction for each phase. All construction and operation and maintenance costs are scheduled by probable years of expenditure on the basis of costs in the first construction year. This year is usually at least one year after the preliminary cost estimation year and is designated in the analysis as the "zero" year.

Except for construction costs in year zero, all other costs are adjusted upward to reflect costs as they will be in the year of occurrence up to and including the fiscal year of 1983. This is explained and illustrated in the section on preparation of the Summary sheet on Economic Analysis.

To ensure the continuation of the project for the 30 year study period, costs of replacement for all items with less than 30 years of life are included under costs. Depending upon the method used in handling inflation of costs and benefits the estimation of replacement cost will be a part of a general computation or will be handled as a separate computation. The replacement costs are added to other costs.

With a 30 year study period and some cost components lasting more than thirty years, allowance must be made for residual values after 30 years. These values are subtracted from other costs to reflect recovery of part of the project costs.

Costs in the benefit-cost analysis are converted to lump sum values by use of 15 per cent discount rates. These lump sum values are to be compared with benefits estimated year by year for 30 years and converted by the same process to a lump sum.

In order to shadow price costs, it is necessary to have adjustment factors which convert foreign shipments costs into more representative costs based upon use in alternative directions. It is assumed at this time that a 50 per increase is required. This

embodies the difference between world market ratios of foreign exchange and the controlled market, but goes beyond this. It includes the fundamental idea that foreign exchange credits should be valued in terms of their highest and best use. That is, it is not the average value shown in world markets, but the strategic value as determined by the most necessary use of foreign exchange credits in the national interest.

Common labor is adjusted downward as an element in a project budget to the extent there is a lower valued alternative use for it. It is possible to estimate alternative values if sufficient time and data are available. In fact, it is understood that efforts are being made by NEDA personnel to develop appropriate values to be used to shadow price labor. Until such values are developed, it is recommended that the value of common labor in alternative employment be considered equal to 50 per cent of estimated cost to the project.

FINANCIAL ANALYSIS

From the financial standpoint, it is essential that each project be studied to determine if the water supply improvements can be paid for by the local water district. The determination is based upon all costs of the district, both existing and new and the demand for water and the prices which can be charged various types of users without exceeding their abilities to pay. A major consideration in this analysis is the plan for amortization of the loan funds required to underwrite the proposed projects. In particular, it is essential to

recognize the burden of costs during and immediately following construction and the ability of the district water users to carry the burden before the new supply is fully utilized.

Very generally, the financial analysis is based upon a standardized approach to costing. These include costs of operation and maintenance, loan amortization and the establishment of one or more reserve accounts. The total of these charges is used in conjunction with estimated volume of water to be produced and sold by the Water District to determine minimum sale price required to cover all costs. The price is compared with the estimated average payment ability of water users in the community to determine if it is reasonable to think they would buy and pay for the quantity of water to be delivered. The ratio between the average ability to pay and the average cost of producing the water can be computed on a year by year basis for the first critical years. If the estimated ability level is above the average price required for breakeven, the project promises to be financially sound. If the ability to pay is at or below the necessary level, the project becomes financially questionable. It is anticipated that some districts may not have the ability to meet all costs as computed. Others will have a margin of ability beyond that required. Districts can be compared in terms of their relative abilities to meet the cost of water as estimated in this financial approach.

Throughout the procedures developed here, it is assumed that all districts have a desire to be financially solvent and will work to this end. That is to say, there is no factor built into the financial

calculations which will remove the need to determine the likelihood that a District will be able and willing to carry out its obligations under a loan agreement.

The total District costs are converted on an annual basis to cost per cubic meter of water delivered. These costs are computed for each year until average costs stabilize. This will usually be after the project design year due to the delayed effect of amortization scheduling.

For each community an estimate can be made of the average repayment ability of the water users. This can be done in terms of average income for the bulk of the people and the share of such income which can be devoted to the purchase of water. In a recent study (Philippines) it was found that 4 to 8 per cent of income could be devoted to the purchase of water. If the bulk of the families in a district earn P300/month or more, water service could cost between P18 and P24 per month without exceeding the payment ability of most families. At P200, the limits would be between P12 and P16 per month.

A family with 6 family members would use, about 600 liters per day or about 18.6 M³ per month. Except in unusually poor communities, it is therefore estimated that at the present (1976), P.85 to P1.00 could be paid for household water supplies. Assuming commercial and industrial users could pay P1.70 to P2.00 per M³ and that such use would be 20 per cent of total delivered water, the combined average payment ability would be about P1.00 at the lowest and P1.20 at the highest.

Allowing for changes over time in the composition of demand, that is the share of domestic and non-domestic use, and for inflation of repayment ability to match inflation of costs, ratios will be computed for each year. If the ratio between payment potential per cubic meter and pesos needed per cubic meter is one or better, the project will have a favorable financial outlook.

STEPS IN THE ECONOMIC JUSTIFICATION ANALYSIS

1.0 CONCEPT OF A SUMMARY SHEET

A summary sheet will be prepared on which all of the benefit and cost data for a 30 year period of study is presented. This sheet will include costs in four categories. These are investment or project costs, operation and maintenance costs, replacement costs, and salvage or residual values. Benefits will be presented in at least two categories and in one major national interest adjustment. These are benefits to water users, benefits in reduced fire losses, and national interest benefits. The latter type is over and above the first two. It reflects relative changes in health, welfare and productivity which the project supplies and for which it is given a national interest benefit adjustment.

The summary sheet is limited to the net costs and net benefits of the proposed project. All existing or to be expected costs and benefits in the absence of the project are excluded from this table. Care to distinguish the costs and benefits of the new facilities is a key element in benefit-cost analysis.

Reference should be made to illustrative tables which accompany this explanation.

2.0 IDENTIFICATION OF THE SUMMARY TABLE

In course of analyzing numerous projects, it is easy to become confused. Even in the analysis of one project there are several tables and supplementary tables which require individual identification to avoid later confusion. The blank summary page should be given both a general and specific title as a first step. For example:

Summary Economic Analysis Table
Gapan Water Supply Project
Economic Justification Analysis, National Viewpoint

The table should also show the date on which it was prepared and the name of the one who prepared it.

3.0 DESIGNATION OF PROJECT STUDY PERIOD

If the study period is 30 years, the construction year, or first construction year, if there are more than one, is designated zero year. The first year in which benefits accrue is designated year one and each year of the study thereafter consecutively to year 30. Additionally, year 31 is shown to take care of the computation of residual or salvage value in the year following the study period. The numbers are entered in the left hand column. It is recommended that each project year be given a calendar year designation, also.

COST ASSOCIATED WITH THE PROJECT

Project related costs will be entered in construction cost, operation and maintenance cost, replacement, and a salvage value column. All costs in these columns will be based at the outset upon the price level of the mid-point of the first construction or zero year. Adjustments for inflation will be made after all costs have been identified in terms of first project year.

4.0. PROJECT COSTS AND THE NATIONAL VIEWPOINT

Economic analysis requires that project costs be adjusted to reflect the national interest. The process is referred to as "shadow pricing". This consists in estimating what an equal amount of labor, foreign exchange or other components would accomplish if used in their highest alternative use. That is to say, the true cost of the project to the nation is not what it costs in pesos, but what it represents in productivity or use foregone. Unemployed labor hired for the project represents a zero cost inasmuch as its alternative production would

be nil. Foreign exchange credits could be put to a very high use, on the other hand, inasmuch as such exchange is limited in supply.

Two classes of project components are adjusted in the present analysis to reflect alternative value. These are common labor estimated to produce about 50 per cent of its project cost in its alternative use, and foreign components assumed to have a value in foreign exchange 1.50 times actual estimated outlay.

4.1 THE STEPS IN ESTIMATING ECONOMIC COSTS

The summary table would be too cumbersome if the calculation of economic costs was included in it. It is necessary to prepare one or two auxiliary tables based upon data found in the reconnaissance or other more detailed studies.

- 4.1.1 The auxiliary table or tables will first list all project components and their costs in total and in foreign and domestic shares. The cost items should include the cost of land project components and an allowance for engineering and contingencies. In the absence of actual data, land costs are estimated at 5 per cent of other direct project costs and, on the recommendation of staff, engineering and contingencies are estimated at 25 per cent of the total of land and other project costs combined. Project costs should include all elements required to make the project work. See Table 4.1.1., page 25.
- 4.1.2 Engineering and contingency costs should be allocated to each element of cost by total, foreign and domestic in a second table or sub-table. See Table 4.1.2, page 26.
- 4.1.3 Economic costs do not include taxes inasmuch as these are transfers between governmental agencies. Taxes are not

imposed on imports. However, there are estimated to be taxes hidden in domestic costs exclusive of common labor. In order to estimate the amount of hidden taxes, a table is prepared which deducts common labor from domestic costs on an item by item basis and divides the residual domestic cost into 5 per cent taxes and 95 per cent non-tax elements. Common labor is estimated on the basis of a table prepared by the technical staff. The choice of 5 per cent of residual domestic costs as taxes is indicative rather than precise. See Table 4.1.3, page 27.

4.1.4 SHADOW PRICING OF PROJECT COSTS TO SECURE ECONOMIC COSTS

Based upon the data in the tables described above, foreign components costs are entered in a economic costs table at 1.50 times their nominal cost. Common labor costs are entered at .50 times their estimated pesos costs. Remaining domestic costs are left unchanged or are multiplied, in effect, by a factor of 1.00. The total of the foreign components, common labor and all other domestic costs, after shadow pricing, become the basic economic costs of the project. See Table 4.1.4, page 28.

4.1.5 COST ENTRIES IN COLUMN 1

In the construction cost column will be entered all economic costs associated with the proposed development. These costs will be entered in the zero project year and in as many succeeding years as the completion of the project requires. In most projects major improvements will be made in one or two years, but a period of several years will be required for full implementation, including connecting new houses in the service area as population grows. The project must include all facilities required to deliver water to every user in the service area, otherwise benefits can not be claimed in total.

4.1.6 SCHEDULING PROJECT COSTS

All proposed projects assume there is an existing need for water which is unsatisfied. It is anticipated first construction will supply the needs of potential users who are already in the market for water. In addition, it is anticipated that growth in population and in the need for water will make it necessary to extend service to new customers each year to and including 1983. Thus, service connections and meters will be programmed for installation by years to reflect growth in market demand.

In the Gapan Water Project Analysis, as an illustration, it was estimated that the first year construction program would provide meters to 2000 households and service connections to 1,500. Five hundred of the meters would be used to meter existing water users. The remaining 2,000 potential customers would be provided connections and meters in equal and annual installments through 1983. Full utilization of project water is achieved and all benefits to health, welfare and productivity can be claimed.

4.2 ADJUSTMENT OF ECONOMIC COSTS TO CONSTRUCTION YEARS

All costs in the reconnaissance studies are estimated for July 1, 1976. If projects are not undertaken until 1977 or later, costs must be adjusted upward to reflect probable costs at the time of construction. It is recommended that all costs be based at first on July 1, 1977, the estimated mid-point of the first full construction year. With reconnaissance costs based upon July 1, 1976, it is necessary that all individual cost items be adjusted upward by 12 per cent to reflect a one year price level change. The mid-point of the first project year 1977 or the year "zero" price level should be used as the base for all costs and benefit values at the outset, to

ensure that every element in the benefit-cost comparison are on the same price level at the start of the analysis. See Table 4.2, page 29.

4.2.1 ALLOCATION OF COSTS TO CONSTRUCTION YEARS

Major construction is assumed to take place in 1977 or year zero. After that year, further construction takes place as population grows and water connections must be added.

The total of economic costs must be divided into first year costs and costs to be incurred after the first year to and including 1983. A simple table will make the distinctions clear. For example, all costs of new wells, pumps and the like will be incurred in the first year. In addition, a share of the connections and meters will be installed to meet existing demand. Quite likely the only costs not incurred in the zero year will be some of the connections and some of the meters. These costs are deducted from the total of all economic costs of the project and allocated in equal amounts to the post construction years. These annual allotments of construction funds are entered in the same column as the construction amount shown in year zero. All adjusted construction costs are shown in July 1, 1977 prices. See Table 4.2.1, page 30.

5.0 OPERATION AND MAINTENANCE COSTS

Operation and maintenance costs are estimated on the basis of standard practice to include maintenance of water sources, operation and maintenance of pumps, maintenance of the distribution system, including meters and administrative overhead. In general operation and maintenance costs will rise with the increase in numbers of connections and more especially, with increased volumes of water pumped and delivered. Operation and maintenance costs are to be developed on a sheet to

be attached as an exhibit to the summary sheet. All operation and maintenance costs are to be in 1977 prices to this point in the analysis.

Estimated costs of operation and maintenance are entered the second cost column in project years 1 through 7. Full development having been accomplished by the close of 1983, the peso amount required for O & M in 1984 is at a maximum.

6.0 REPLACEMENT OF PROJECT FACILITIES

Project components will be rated as to life expectancy by use of a standard list of water project components which shows average years of probable life. All facilities in the proposed project will be placed in a table and identified as to life expectancy. Any item which require replacing before the 30th year will be identified and its value entered on the study line appropriate as the year of replacement in a third cost column. The amount entered is the full cost in economic terms of the elements to be replaced. All costs up to this point are stated in 1977 prices. Any project component with a life of 31 years or more will not be shown in the replacement column. See Table 6.0, page 31.

7.0 SALVAGE OF PROJECT FACILITIES

Although it is anticipated the water district will continue to operate after the 30 years at an unabated rate, the study period has been limited to 30 years. Since benefits to be evaluated are enjoyed for only the 30 year study period, it is necessary that any residual value of project facilities in the 31st year be subtracted from all other costs to ensure that only benefit-related costs are charged to the period.

All facilities showing a life expectancy of 50 years of potential life in the replacement table will have a value after

30 years equal to about 20 years of their original value. Facilities due for replacement in the 31st year will have zero value remaining. Likewise, elements shown as being replaced in the 11th and 21st year or in the 16th year, which would be due for replacement again in the 31st year, are assumed to have lost all value by the end of the 30th year. There would be no salvage or residual value to estimate.

All project components with salvage value in the 31st year are individually rated as to the portion of original value remaining. The sum of the salvage values is entered in column 4 of the table and the entry is boxed to show that it is to be subtracted from the total of other costs. See Table 7.0, page 32.

8.0 TOTAL PROJECT AND RELATED COSTS

Costs in the four columns are to be added and placed in the 5th column. Salvage values are to be boxed.

9.0 PRICE LEVEL CHANGES EXPECTED DURING 30 YEARS

It is anticipated inflation will average 12 per cent per year for the 10 year period ending in 1987. Improved conditions in the economy are expected to reduce this rate to an average of ten in the period 1988 through 1997. For the final ten years, with continued improvement in the domestic economy and in world trade conditions, the rate is expected to drop to 8 per cent per year. It is believed this progression is realistic and suited for use in planning.

It is recommended that standard practice include the application of price inflation factors to both costs and benefits prior to discounting with the selected social cost of money. Inflation factor are entered in column 6. Zero year is valued at 1.00.

10.0 INFLATION OF COSTS

Price adjustment factors are applied to total annual cost figures, based on 1977 prices, to secure a composite annual cost which adds construction, operation and maintenance and replacement costs and subtracts salvage values. These costs are entered in column 7.

11.0 WATER USE BENEFITS TO LOCAL WATER USERS

Beneficial use of water is based upon the volume of water consumed by householders, business as industrialists and other non-domestic users. In an auxiliary table, the rise in the volume of the water delivered by the project is estimated. This volume is the difference in estimated total demand and the amount which the existing system, if any, would deliver in the absence of the project. On the assumption that water users in the 100 cities in 1976 value water at about ₱1.50 per M³ for household use and ₱2.50 M³ for commercial, industrial and other purposes, these values will be raised to the 1977 price level by use of 12 per cent. Depending upon the share of water going to domestic and non-domestic users, a composite value is secured. This value will change between 1977 and 1983 to reflect any change in proportions of water going to each major use. The volume of water delivered will be multiplied by the appropriate annual value to secure the benefit of water in use. The total of volume and value is entered in column 8.

12.0 FIRE REDUCTION BENEFITS TO LOCAL RESIDENTS

Based upon an estimate that the average community loss to fires is equal to about 1.5 per cent of the value of all improvements in the absence of the project and about .75 per

cent with the project, it is possible to estimate fire loss reduction benefits to a community. To estimate savings, a computation is made on an auxiliary sheet. In this computation the average value per structure is estimated for 1977 and multiplied by the number of structures in the area to be served. A similar calculation is made for each year to reflect growth in the area and in number of structures to be protected. If the average value is ₱20,000 and the fire loss saving is .75 per cent, there would be a saving of about ₱150 per unit per year. By relating values per unit and reduced losses per unit to number of units, annual benefit figures can be derived. These values are entered in column 9 of the summary table.

13.0 TOTAL PROJECT BENEFITS

Water use and fire loss reduction benefits from columns 8 and 9 are added and entered in column 10.

14.0 BENEFITS AFTER INFLATION

Inflation factors in columns 6 are used with total benefits in column 10 to secure benefit values after inflation. These are entered in column 11.

15.0 DISCOUNT FACTORS

Present worth discount rates are obtained from a 15 per cent interest table. These values are entered in column 12 for use with both costs and benefits. Zero project year has a value of 1.00.

16.0 DISCOUNT OF PROJECT COSTS

Discount factors in column 12 are used with costs in column 7 to secure discounted cost values. These values are

entered in column 13.

17.0 DEISCOUNTS OF PROJECT BENEFITS

Present worth factors in column 12 are used with inflated benefits in column 11 to secure discounted values of benefits. These values are entered in column 14 and added to obtain the lump sum value of benefits to local water users.

18.0 NATIONAL INTEREST BENEFITS'

In addition to direct benefits of water to users and to service area residents from reduced fire losses, there are benefits which accrue to the nation as a whole. Depending upon the conditions in the service area before the project, the added benefit to the nation may be quantified as 5, 10, 15 or 20 per cent of the direct benefits.

The choice of the appropriate adjustment factor is made by the use of the table which follows, a separate sheet is required to permit the listing. See next page and Table 18.0, page 33.

TABLE FOR DETERMINING NATIONAL INTEREST EFFECT OF PROJECTS

Each community under preliminary investigation shall be rated as to the favorable effects of the proposed project upon income, water supply, economic growth and health. The following table has been developed to permit such a rating on the basis of available statistics and the effects of the planned project. Each of the numbered elements is given a weight of one.

After each item is rated 1 to 3, the individual ratings, as with wages, are averaged and a single value used. Totals will range from 6 to 18, adjustment are rounded values at 5 per cent intervals. Thus, 18 per cent would round to 20 and 17 per cent to 15.

Table of Values

| <u>Elements in Rating</u> | <u>Values To Be Designed</u> | | |
|-------------------------------------|------------------------------|-----------|---------------|
| | <u>1</u> | <u>2</u> | <u>2</u> |
| 1.0 Taxes Paid per Capita | ₹31+ | 20-30 | 19 or less |
| 2.0 Truck Driver Daily Wages | 15+ | 10-14 | 9 or less |
| Common Labor | 9+ | 8 | 7 or less |
| Plumbers Wage | 13+ | 11-12 | 10 or less |
| 3.0 Carpenters Wage | 13+ | 11-12 | 10 or less |
| 3.0 % Connected to System | 31+ | 20-30 | 19 or less |
| Use per Capita | 101+ | 60-100 | 59 or less |
| Persons per Connection | 29 or less | 30-59 | 60 or more |
| 4.0 Population Growth, 1975-1983 | 19% or less | 20-59 | 60 or more |
| Persons per Hectare | 99 or less | 100-199 | 200 or more |
| 5.0 Morbidity, 1970-73, per 100,000 | 500 or less | 501-1,000 | 1,001 or more |
| 6.0 Mortality, 1970-73, per 100,000 | 40 or less | 41-60 | 61 or more |

19.0 BENEFIT TO COST RATIO AND NET BENEFIT VALUE

The lump sum of benefits is divided by the lump sum of costs to determine the benefit-cost ratio. Benefits before and after allowances for national interest are to be computed. Another measure of feasibility is the net benefit value, that is, the difference between benefits and costs. These computations are entered at the bottom of the summary table.

20.0 ANNUAL EQUIVALENT VALUES

Lump sum benefits and costs are converted to annual equivalences by use of the capital recover factor for 15 per cent and 30 years. The annual equivalent figures give an idea of what project values would be if they were received in equal installments during the 30 years.

21.0 INTERNAL RATE OF RETURN

The internal rate of return is determined by successive computations using discount rate at 5 per cent intervals above 15 per cent when the benefit-cost ratio is favorable and below when the ratio is unfavorable. When the discount rate yields an unfavorable benefit-cost ratio, above 15 per cent, indicating the internal rate of return has been exceeded, the rate is approximated by interpolation. Where the discount rate is close to the break-even but the internal rate of return is slightly higher than the highest discount used, the actual value can be closely approximated by extrapolation. See Table 21.0 for the interpolation of Gapan internal rate of return. See Table 21, page 34.

22.0 BENEFITS AND COSTS WITH PARTIAL INFLATION

As an alternative method of computing economic feasibility, all costs and benefits can be frozen in the final project year. In the present instance adjustments to values would terminate in 1983. Benefits and costs flows would change to 1984, but would not inflate.

Replacement and salvage values would be handled as in the standard procedure by first inflating to the year of replacement or salvage and then discounting by the social cost of money factor used in the other table.

Computations are relatively simple if the standard procedure has been followed inasmuch as all of the necessary ingredients have been prepared. Discounting is simplified by the fact most costs and all benefits remain constant for 24 years and two calculations give lump sum values for the entire period.

The calculation of the internal rate of return is also simplified. The same short-cut procedures can be used in finding the approximate value.

23.0 COSTS OF THE LEAST COST ALTERNATIVE

If adequate data are available, the lump sum costs of the least cost alternative can be computed. The identical steps are required as were taken in obtaining the lump sum costs of the proposed project.

The lump sum costs of the least costly alternative are compared with the lump sum benefits calculated under either the full inflation or standard procedure or the partial inflation procedure. The lower value takes precedence and is used as the measure of benefit to be used to compute the final benefit-cost ratio.

Where truly adequate alternatives have not been explored and costs do not exist, an approximation of what it would cost should be made. Such approximations should be based upon the judgment of experienced staff and should be accompanied by an explanation of what an alternative would be and about how much it would cost in comparison with the proposed project. This process would ensure that a least costly alternative would not be overlooked and would give a validation to the proposed project.

| Project Years | Project Related Costs and Values | | | | Total | Inflation Factors | Adjusted for Inflation | Direct Credits | | | Benefits Adj. For Inflation | Present Worth 15% | Present Worth | |
|---------------|----------------------------------|-------|-------------|---------|-------|-------------------|------------------------|----------------|--------------|-------|-----------------------------|-------------------|---------------|----------|
| | Construction | O & M | Replacement | Salvage | | | | Water Use | Reduced Loss | Total | | | Costs | Benefits |
| 1977 0 | 6,320 | - | - | - | 6,320 | 1,000 | 6,320 | - | - | - | - | 1,000.0 | 6,320 | - |
| 8 1 | 242 | 327 | - | - | 569 | 1,120 | 637 | 1,106 | 240 | 1,346 | 1,506 | 369.6 | 554 | 1,311 |
| 9 2 | 242 | 365 | - | - | 607 | 1,254 | 761 | 1,462 | 300 | 1,762 | 2,210 | 736.1 | 575 | 1,671 |
| 1980 3 | 242 | 403 | - | - | 645 | 1,404 | 906 | 1,818 | 360 | 2,178 | 3,058 | 657.5 | 596 | 2,011 |
| 1 4 | 242 | 441 | - | - | 683 | 1,574 | 1,075 | 2,174 | 420 | 2,594 | 4,083 | 571.8 | 615 | 2,435 |
| 2 5 | 243 | 479 | - | - | 722 | 1,762 | 1,272 | 2,530 | 480 | 3,010 | 5,304 | 497.2 | 632 | 2,837 |
| 3 6 | 243 | 517 | - | - | 760 | 1,974 | 1,500 | 2,866 | 540 | 3,426 | 6,763 | 432.3 | 645 | 2,924 |
| 4 7 | - | 554 | - | - | 554 | 2,211 | 1,225 | 3,243 | 600 | 3,843 | 8,407 | 375.9 | 460 | 3,194 |
| 5 8 | - | 554 | - | - | 554 | 2,476 | 1,372 | 3,243 | 600 | 3,843 | 9,515.3 | 326.9 | 449 | 3,111 |
| 6 9 | - | 554 | - | - | 554 | 2,773 | 1,536 | 3,243 | 600 | 3,843 | 10,656.6 | 284.3 | 437 | 3,030 |
| 7 10 | - | 554 | - | - | 554 | 3,108 | 1,721 | 3,243 | 600 | 3,843 | 11,936.4 | 247.2 | 425 | 2,951 |
| 8 11 | - | 554 | - | - | 554 | 3,417 | 1,893 | 3,243 | 600 | 3,843 | 13,131.5 | 214.9 | 407 | 2,822 |
| 9 12 | - | 554 | - | - | 554 | 3,750 | 2,082 | 3,243 | 600 | 3,843 | 14,442.0 | 186.9 | 389 | 2,699 |
| 1990 13 | - | 554 | - | - | 554 | 4,134 | 2,290 | 3,243 | 600 | 3,843 | 15,897.0 | 162.5 | 372 | 2,582 |
| 1 14 | - | 554 | - | - | 554 | 4,547 | 2,519 | 3,243 | 600 | 3,843 | 17,474.1 | 141.3 | 356 | 2,469 |
| 2 15 | - | 554 | - | - | 554 | 5,004 | 2,772 | 3,243 | 600 | 3,843 | 19,230.4 | 122.9 | 341 | 2,363 |
| 3 16 | - | 554 | 3,002 | - | 3,556 | 5,504 | 20,068 | 3,243 | 600 | 3,843 | 21,151.9 | 106.9 | 2,145 | 2,261 |
| 4 17 | - | 554 | 129 | - | 683 | 6,054 | 4,135 | 3,243 | 600 | 3,843 | 23,265.5 | 92.9 | 364 | 2,161 |
| 5 18 | - | 554 | 129 | - | 683 | 6,659 | 4,548 | 3,243 | 600 | 3,843 | 25,590.5 | 80.8 | 367 | 2,068 |
| 6 19 | - | 554 | 129 | - | 683 | 7,324 | 5,002 | 3,243 | 600 | 3,843 | 28,146.1 | 70.3 | 352 | 1,979 |
| 7 20 | - | 554 | 129 | - | 683 | 8,052 | 5,503 | 3,243 | 600 | 3,843 | 30,963.1 | 61.1 | 336 | 1,892 |
| 8 21 | - | 554 | 129 | - | 683 | 8,802 | 6,043 | 3,243 | 600 | 3,843 | 33,441.8 | 53.1 | 316 | 1,776 |
| 9 22 | - | 554 | 129 | - | 683 | 9,595 | 6,417 | 3,243 | 600 | 3,843 | 36,105.0 | 46.2 | 296 | 1,669 |
| 2000 23 | - | 554 | - | - | 554 | 10,437 | 6,624 | 3,243 | 600 | 3,843 | 39,014.1 | 40.2 | 226 | 1,568 |
| 1 24 | - | 554 | - | - | 554 | 10,958 | 6,071 | 3,243 | 600 | 3,843 | 42,111.6 | 34.9 | 212 | 1,470 |
| 2 25 | - | 554 | - | - | 554 | 11,836 | 6,557 | 3,243 | 600 | 3,843 | 45,485.7 | 30.4 | 199 | 1,383 |
| 3 26 | - | 554 | - | - | 554 | 12,787 | 7,084 | 3,243 | 600 | 3,843 | 49,140.4 | 26.4 | 187 | 1,297 |
| 4 27 | - | 554 | - | - | 554 | 13,810 | 7,651 | 3,243 | 600 | 3,843 | 53,071.8 | 23.0 | 176 | 1,221 |
| 5 28 | - | 554 | - | - | 554 | 14,914 | 8,262 | 3,243 | 600 | 3,843 | 57,314.5 | 20.0 | 165 | 1,146 |
| 6 29 | - | 554 | - | - | 554 | 16,106 | 8,923 | 3,243 | 600 | 3,843 | 61,895.4 | 17.4 | 155 | 1,077 |
| 7 30 | - | 554 | - | - | 554 | 17,472 | 9,637 | 3,243 | 600 | 3,843 | 66,849.0 | 15.1 | 146 | 1,009 |
| 5 31 | - | - | - | - | 554 | 18,789 | 26,117 | 3,243 | 600 | 3,843 | 72,013.1 | 13.1 | 146 | 1,009 |

Notes: Col 1. Construction costs in 1977 values allocated to years of construction.
 Col 2. Operation and Maintenance Cash in 1977 values.
 Col 3. Replacement of Elements with 15 year life.
 Col 4. Salvage values on 31st year of Land and other Elements.
 Col 6. Inflation at 12 per cent, 10 years, 10 per cent, 10 years and 5 per cent, 10 years.
 Col 8. Volume and per unit value in 1977 combined.

18,896 62,087⁽¹⁾ L.S. Valves
 1.00 3.29 E/C Ratio
 18,896 68,296⁽²⁾ Benefits Ad:
 1.00 3.61 B/C Ratio

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TABLE 4.1.1

GAPAN WATER SUPPLY PROJECT
BASIC COSTS, JULY 1, 1976
(P1,000)

| <u>Components</u> | <u>Total</u> | <u>Foreign</u> | <u>Domestic</u> |
|----------------------------|--------------|----------------|-----------------|
| Land @ 5% Direct | P 244 | - | P 244 |
| Deep Wells, 4 | 1,120 | P 225 | 895 |
| Pumps, 4, 15 Hp | 360 | 255 | 105 |
| Meters, 4000 | 840 | 600 | 240 |
| Overhaul Existing Pump | 50 | 50 | - |
| Service Connections, 3,500 | 860 | 173 | 687 |
| Fire Hydrants | 667 | 202 | 465 |
| Distribution | <u>992</u> | <u>240</u> | <u>752</u> |
| Sub-Total | 5,133 | 1,745 | 3,388 |
| Eng. and Cont. @ 25% | <u>1,283</u> | <u>436</u> | <u>847</u> |
| TOTAL | 6,416 | 2,181 | 4,235 |

Source: Reconnaissance Study of Gapan. Land added. Meters increased from 100 to 4,000. Engineering and contingencies added @ 25 per cent of other costs.

TABLE 4.1.2

**GAPAN WATER SUPPLY PROJECT
 BASIC COSTS, JULY 1, 1976 -
 ENGINEERING AND CONTINGENCIES SPREAD
 (P1,000)**

| <u>Components</u> | <u>Total</u> | <u>Foreign</u> | <u>Domestic</u> |
|---------------------|--------------|----------------|-----------------|
| Land | P 305 | - | P 305 |
| Deep Wells | 1,400 | P 281 | 1,119 |
| Pumps | 450 | 319 | 131 |
| Meters | 1,050 | 750 | 300 |
| Overhaul Pump | 62 | 62 | - |
| Service Connections | 1,075 | 216 | 859 |
| Fire Hydrants | 834 | 253 | 581 |
| Distribution | <u>1,240</u> | <u>300</u> | <u>940</u> |
| TOTAL | 6,416 | 2,181 | 4,235 |

Source: Reconnaissance Study of Gapan

TABLE 4.1.3

GAPAN WATER SUPPLY PROJECT
BASIC COSTS, JULY 1, 1976
DOMESTIC COSTS DISTRIBUTED
(P1,000)

| <u>Components</u> | <u>Domestic Costs</u> | | | | |
|---------------------|-----------------------|---------------------|----------------|--------------|----------------|
| | <u>Total</u> | <u>Common Labor</u> | <u>Balance</u> | <u>Taxes</u> | <u>Residue</u> |
| Land | P 305 | - | P 305 | P 15 | P 290 |
| Wells | 1,119 | 224 | 895 | 45 | 850 |
| Pumps | 131 | 26 | 105 | 5 | 100 |
| Meters | 300 | 60 | 240 | 12 | 228 |
| Overhaul Pump | - | - | - | - | - |
| Service Connections | 859 | 172 | 687 | 34 | 653 |
| Fire Hydrants | 581 | 116 | 465 | 23 | 442 |
| Distribution | <u>940</u> | <u>188</u> | <u>752</u> | <u>38</u> | <u>714</u> |
| Total | 34,235 | 786 | 3,449 | 172 | 3,277 |

Source: Reconnaissance Study of Gapan,

TABLE 4.1.4

GAPAN WATER SUPPLY PROJECT
BASIC COSTS, JULY 1, 1976
TAXES REMOVED, SHADOW PRICED
(P1,000)

| <u>Components</u> | <u>Foreign (x 1.5)</u> | <u>Common Labor (x .5)</u> | <u>Other Domestic (x 1.0)</u> | <u>Total Adjusted</u> |
|---------------------|----------------------------|--------------------------------|------------------------------------|---------------------------|
| Land | - | - | P 290 | P 290 |
| Wells | P 422 | P 112 | 850 | 1,384 |
| Pumps | 478 | 13 | 100 | 591 |
| Meters | 1,125 | 30 | 228 | 1,383 |
| Overhaul Pump | 94 | - | - | 94 |
| Service Connections | 323 | 86 | 653 | 1,062 |
| Fire Hydrants | 300 | 58 | 442 | 879 |
| Distribution | <u>450</u> | <u>94</u> | <u>714</u> | <u>1,258</u> |
| Total | 3,272 | 393 | 3,277 | 6,941 |

Source: Reconnaissance Study of Gapan

TABLE 4.2

GAPAN WATER SUPPLY PROJECT
COSTS AFTER TAXES AND SHADOW PRICING
ADJUSTED TO JULY 1, 1977 PRICE LEVEL
(P1,000)

| <u>Components</u> | <u>Total</u> | <u>July 1, 1977 Construction Year Zero</u> | <u>Other</u> |
|---------------------|--------------|--|--------------|
| Land | P 325 | P 325 | - |
| Wells | 1,550 | 1,550 | - |
| Pumps | 662 | 662 | - |
| Meters | 1,549 | 775 | 774 |
| Overhaul Pump | 105 | 105 | - |
| Service Connections | 1,189 | 510 | 679 |
| Fire Hydrants | 984 | 984 | - |
| Distribution | <u>1,409</u> | <u>1,409</u> | <u>-</u> |
| Total | P7,773 | P6,320 | P1,453 |

Source: Reconnaissance Study of Gapan 1976 Prices adjusted by 12 per cent to reach 1977 levels. Fifty per cent of meters and 43 per cent of service connections in first construction year. Fifty per cent of meters and 57 per cent of connections to occur in Study years 1 through 6.

TABLE 4.2.1

GAPAN WATER SUPPLY PROJECT
 SCHEDULE OF COSTS, 1978-1983
 (P1,000)

| Components | July 1, 1977, Price Level | | | | | | Total |
|-------------|---------------------------|------------|------------|------------|------------|------------|------------|
| | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | |
| Meters | 129 | 129 | 129 | 129 | 129 | 129 | 774 |
| Connections | <u>113</u> | <u>113</u> | <u>113</u> | <u>113</u> | <u>113</u> | <u>114</u> | <u>679</u> |
| Total | 242 | 242 | 242 | 242 | 242 | 243 | 1,453 |

PRICES AT TIME OF CONSTRUCTION

| | | | | | | |
|-------------|------------|------------|------------|------------|------------|------------|
| Meters | 144 | 162 | 181 | 203 | 227 | 255 |
| Connections | <u>127</u> | <u>142</u> | <u>159</u> | <u>178</u> | <u>199</u> | <u>225</u> |
| Total | 271 | 304 | 340 | 381 | 426 | 480 |

Source: Reconnaissance Study of Gapan. Construction schedule adapted to growth in population and in number of connections to 1983.

TABLE 6.0
GAPAN WATER SUPPLY PROJECT
COSTS AFTER TAXES AND SHADOW PRICING
LIFE EXPECTANCY AND REPLACEMENT SCHEDULE
ZERO YEAR CONSTRUCTION IN JULY 1, 1977 PRICES
(P1,000)

| <u>Components</u> | <u>LIFE EXPECTANCY</u> | | | <u>Total</u> |
|---------------------|------------------------|-----------------|-------------------|--------------|
| | <u>15 Years</u> | <u>50 Years</u> | <u>Indefinite</u> | |
| Land | - | - | P325 | P325 |
| Wells | 1,550 | - | - | 1,550 |
| Pumps | 662 | - | - | 662 |
| Meters | 775 | - | - | 775 |
| Overhaul Pump | 105 | - | - | 105 |
| Service Connections | - | 510 | - | 510 |
| Fire Hydrants | - | 984 | - | 984 |
| Distribution | <u>-</u> | <u>1,409</u> | <u>-</u> | <u>1,409</u> |
| Total | P3,092 | P2,903 | P325 | P6,320 |

Source: Reconnaissance Study of Gapan Table of Life Expectancies Used Also to Identify Components Needing Replacement.

TABLE 7.0
GAPAN WATER SUPPLY PROJECT
ECONOMIC SCHEDULE OF SALVAGE VALUES

Values in 1977

| Project Years | Components | | Salvage Values | |
|---------------|------------|--------|----------------|--------|
| | Land | Others | Percentage | Values |
| Zero | 325 | - | 75 | 244 |
| Zero | | 2,903 | 40 | 1,161 |
| 17 | | 129 | 7 | 9 |
| 18 | | 129 | 13 | 17 |
| 19 | | 129 | 20 | 26 |
| 20 | | 129 | 26 | 34 |
| 21 | | 129 | 32 | 41 |
| 22 | | 129 | 39 | 50 |

Values in 31st Year
(18.789 Times 1977 Values)

| | |
|-----------------------------------|------------|
| Zero | 4,585 |
| Zero | 21,814 |
| 17 | 169 |
| 18 | 319 |
| 19 | 489 |
| 20 | 639 |
| 21 | 770 |
| 22 | <u>939</u> |
| Total, 31st Year, Inflated Values | 29,724 |

Source: Based on Economic Tables

TABLE 18.0

GAPAN WATER SUPPLY PROJECT
DETERMINATION OF NATIONAL INTEREST FACTOR
BY USE OF NATIONAL INTEREST TABLE

| <u>Rating Elements</u> | <u>Rating Values</u> | | | <u>Gapan Values</u> |
|---------------------------------------|----------------------|-----|----|---------------------|
| | 1 | 2 | 3 | |
| 1.0 City Revenue Per Capita | | | 16 | 3.0 |
| 2.0 Truck Drivers Wage | 15 | | | 1.0 |
| Common Labor | 9 | | | |
| Plumbers Wage | 15 | | | |
| Carpenters Wage | 15 | | | |
| 3.0 % Connected to System | | | 11 | 2.7 |
| Use Per Capita | | | 38 | |
| Persons Per Connection | | 55 | | |
| 4.0 Population Growth, 1975-1983 | | 26 | | 2.0 |
| Persons Per Hectare | | 125 | | |
| 5.0 Morbidity, Per 100,000 | 94 | | | 1.0 |
| 6.0 Mortality, Per 100,000 | 14 | | | 1.0 |
| Total Rated Value | | | | 10.7 |
| Rounded Percentage, Adjustment Factor | | | | 10.0 |

Source: Gapan Reconnaissance Study and Bureau of Health

TABLE 21.0
GAPAN WATER SUPPLY PROJECT
INTERNAL RATE OF RETURN CALCULATION
(P1000)

| Project Years | Costs Adjusted for Inflation | Benefits Adjusted for Inflation | 45% Present Worth Factors | PW of Cost | PW of Benefit | 50% Present Worth Factors | PW of Cost | PW of Benefit |
|---------------|------------------------------|---------------------------------|---------------------------|--------------|-----------------|---------------------------|--------------|-----------------|
| 1977 0 | 6,320 | - | 1.0000 | 6,320 | - | 1.0000 | 6,320 | - |
| 8 1 | 637 | 1,508 | .6897 | 439 | 1,040 | .6667 | 425 | 1,005 |
| 9 2 | 761 | 2,210 | .4756 | 362 | 1,051 | .4444 | 338 | 982 |
| 80 3 | 906 | 3,058 | .3280 | 297 | 1,003 | .2963 | 268 | 906 |
| 1 4 | 1,075 | 4,083 | .2262 | 243 | 924 | .1975 | 212 | 806 |
| 2 5 | 1,272 | 5,304 | .1560 | 198 | 827 | .1317 | 168 | 699 |
| 3 6 | 1,500 | 6,763 | .1076 | 161 | 728 | .0878 | 132 | 594 |
| 4 7 | 1,225 | 8,497 | .0742 | 91 | 630 | .0585 | 72 | 497 |
| 5 8 | 1,372 | 9,515 | .0512 | 70 | 487 | .0390 | 54 | 371 |
| 6 9 | 1,536 | 10,656 | .0353 | 54 | 376 | .0260 | 40 | 277 |
| 7 10 | 1,721 | 11,936 | .0243 | 42 | 290 | .0173 | 30 | 206 |
| 8 11 | 1,893 | 13,132 | .0168 | 32 | 221 | .0116 | 22 | 152 |
| 9 12 | 2,082 | 14,442 | .0116 | 24 | 168 | .0077 | 16 | 111 |
| 90 13 | 2,290 | 15,887 | .0080 | 18 | 127 | .0051 | 12 | 81 |
| 1 14 | 2,519 | 17,474 | .0055 | 14 | 96 | .0034 | 9 | 59 |
| 2 15 | 2,772 | 19,230 | .0038 | 11 | 93 | .0023 | 6 | 44 |
| 3 16 | 20,068 | 21,152 | .0026 | 52 | 55 | .0025 | 30 | 32 |
| 4 17 | 4,135 | 23,266 | .0018 | 7 | 42 | .0010 | 4 | 23 |
| 5 18 | 4,548 | 25,590 | .0012 | 5 | 31 | .0007 | 3 | 18 |
| 6 19 | 5,002 | 28,146 | .0009 | 5 | 25 | .0005 | 3 | 14 |
| 7 20 | 5,503 | 30,963 | .0006 | 3 | 19 | .0003 | 2 | 9 |
| 8 21 | 5,943 | 33,442 | .0004 | 2 | 13 | .0002 | 1 | 7 |
| 9 22 | 6,417 | 36,105 | .0003 | 2 | 11 | .0001 | 1 | 4 |
| 2000 23 | 5,624 | 39,014 | .0002 | 1 | 8 | .0001 | 1 | 4 |
| 1 24 | 6,071 | 42,112 | .0001 | 1 | 4 | .0001 | 1 | 4 |
| 2 25 | 6,557 | 45,486 | .0001 | 1 | 5 | .0000 | | 2 |
| 3 26 | 7,084 | 49,140 | .0001 | 1 | 5 | .0000 | | 2 |
| 4 27 | 7,651 | 53,072 | .0000 | 0 | 3 | .0000 | | 2 |
| 5 28 | 8,262 | 57,314 | .0000 | 0 | 3 | .0000 | | 1 |
| 6 29 | 8,923 | 61,895 | .0000 | 0 | 2 | .0000 | | 1 |
| 7 30 | 9,637 | 66,849 | .0000 | 0 | 2 | .0000 | | 1 |
| 8 31 | <u>26,117</u> | | .0000 | 0 | | .0000 | | |
| | | | | | <u>8,269</u> | | | <u>6,914</u> |
| | | | | | <u>x 1.10 =</u> | | | <u>x 1.10 =</u> |
| | | | | <u>8,456</u> | <u>9,096</u> | | <u>8,170</u> | <u>7,605</u> |
| | | | | NPV = 640 | | | NPV = -565 | |

Interpolate for IRR:

$$IRR = 45\% + x\% \quad x = (50\% - 45\%) \frac{640}{640 + 565} = 2.65\%$$

$$IRR = 45\% + 2.65\% = 48\%$$

Source: Gapan Reconnaissance Study

Preparation of a Financial Summary Table

1.0 Introduction

The second major table in the economic and financial analysis of water projects is the Financial Feasibility or Cash Flow Table.

This table is similar in format to the economic feasibility table but it utilizes a different set of costs and does not involve the concept of benefits. Rather, it deals with average cost per M³ of pumped water and the repayment ability of water users.

The intent of this table is to determine the full costs of water delivered to a composite of water users in the water district and to compare these costs with the average composite payment ability of the district water users. If payment ability is favorable in comparison with total costs, the District will be considered reasonably able to operate and maintain District facilities and to repay loans required to provide the new water supply.

2.0 Headings and Related

A standard heading which clearly identifies the nature of the table, the community involved and its specific content should be used.

3.0 Project Years

Years from zero to 31 shall be identified by number in order and by calendar years.

4.0 Existing and to be Continued Costs

An analysis should be made of the without project financial picture of the District under study. In particular, all costs should be determined and placed on an annual basis. In the table an allowance should be made for the continuation of these costs or for a continuance

of the costs at a reduced level if the project facilities replace or rehabilitate existing facilities and reduce costs. In general, these costs are shown as a fixed stream based upon 1976 prices but adjustment by 12 per cent to reflect 1977 price levels and by standard inflation factors until 1983. Enter in Column 1.

5.0 Project Costs and Amortization Scheduling

Project costs are presented in total in the first auxiliary table to the Benefit-Cost Table. From that table total costs raised to 1977 prices but without adjustments for taxes or shadow prices are to be used. Depending upon the construction program visualized costs are allocated to each construction years. Because there are several steps in obtaining amortization amounts for several construction years, it is recommended that a subsidiary table be prepared. See Table 5.0, page 44.

5.1 In the auxiliary table construction costs are adjusted to the mid-year price level expected to prevail at the time of staged construction. The adjustment factors to be applied to the 1977 costs is 12 per cent compounded to the year of construction. 1977 costs by years, 12 per cent adjustment factors by years, and adjusted costs by years should appear in the auxiliary table alongside each other and opposite the project years 0 through final construction year 6 or 1983.

5.2 Each annual construction fund is to be treated as if it were the basis for a separate LWUA loan. Regardless of the date of borrowing or of expenditures on project features, or the start of amortization, it is assumed in the table that final payments on all loans will be the 30th project year. See Table 5.1 page 44, and Table 5.2 page 45.

- 5.3 It is assumed in the calculation that borrowed funds draw interest for the full construction year and that interest will accumulate and interest charges compound for three years after construction. Further, it is assumed repayment when it starts will be in equal installments of principal and interest at 9 per cent on the unpaid balance.
- 5.4 For each construction advance there will be a calculation of total debt with interest compounding for four years, at 9 per cent, the total debt will be 1.404 times the loan amount. The loan amount will reflect costs at the time of construction and a 40 per cent increase to cover accumulated interest.
- 5.5 If basic construction occurs in 1977, the loan for that year would accumulate to the end of 1980. Beginning in 1981 it would be paid back in 27 equal installments of principal and interest at 9 per cent. Each succeeding loan would be handled in the same way. The repayment amount would differ only because the period of repayment is shorter by one year in each case. The accumulative total of the amortization requirements will be entered in column two of the summary table.

6.0 Operation and Maintenance Costs of New Facilities

Estimates were made of probable operation and maintenance costs of the new facilities and of the water delivered by them for the benefit-cost analysis. These basic costs are usable in the financial table, too. Enter these costs in column 4 after having adjusted them to 1977 and to succeeding years up to and including 1983.

7.0 Reserve Accounts

It is the policy of LWUA for a 10 per cent account to be

established to supplement operation and maintenance budgets, if needed, guarantee debt service, and to provide a capital extension fund. It is recommended that this procedure be adopted in each case in order to determine if the project can handle such reserves and survive. It is also recommended that the bad debt reserve of 5 per cent be added to conform to LWUA policy.

To obtain these two values add costs exclusive of reserves and enter the total in column 4. Into this total divide .85 and place the results in column 7. Column 6 is to be used for a combined reserve account of 15 per cent.

8.0 Special Replacement Reserve

A significant share of some project costs are elements which will have to be replaced in 15 years. It is suggested they be funded and compounded annually. The amount to be set aside to equal the districts replacement needs in the 16th and immediately succeeding years would be about 19 per cent of the cost of the elements at the time of first construction. The 19 per cent is calculated to match the first year need in the 16th study year. Similar funding for later stages to the extent of 19 per cent per year of the replacement value at the time of construction is recommended in order that the full cost burden is recognized. This deposit starts in year 1 and continues until drawn against in the 16 and succeeding years. Enter in column 8. See Table 8.0, 8.01, 8.02, pages 47, 48, and 49.

9.0 Escalation of Costs

Estimated costs of construction are all escalated to the year of use. To remain in line, old costs are escalated up to 1983, the

year of final construction costs. Amortization schedules will automatically include price inflation inasmuch as they are based on costs as of the date of actual construction. Operation and maintenance costs are adjusted up to 1983 to show inflationary effects. With all basic costs adjusted to reflect price rises the 10 and 5 per cent reserves automatically allow for inflation. The proposed replacement funding will be adjusted automatically inasmuch as it is based upon basic costs which reflect the year of construction.

10.0 Gross Water Produced and Water Delivered

It is estimated that 20 per cent of new gross water produced by most projects will not be delivered to the users. Even more of the old water, about 40 per cent will not be delivered. Therefore, the costs per M³ developed which are described above must be converted into costs per M³ of delivered water. Only this water can be sold and can be counted on to finance operation of the District and the amortization of loans. Net water delivered is entered in columns 10, 11, and 12.

11.0 Old Water and New Water

Reference is made to the total quantity of water used in the district. Costs include old and new costs. Water delivered includes all water, both old and new.

Because of the increase in system connections until 1983, the volume of water delivered each year will grow from project year one

to project year 7. After that year the volume will remain static in total. See Table 11, page 50.

12.0 Average Cost of Water

It is probable the average cost of water will rise for the first several years. Where there are a series of construction years the full burden may not be felt until four years after 1983. Analysis for the entire period is recommended in every cases. Enter average costs per M^3 in column 13.

13.0 Repayment Ability

Repayment ability will differ somewhat from community to community. Based upon the Lipa study it has been estimated that 6 to 8 per cent of family income would be spent on a good water supply if necessary. On a family income of ₱300 per month, the total available would be ₱18 to ₱24 per month. At 90 liters per capita, six and one half family members and 31 days in a month, the average consumption would be about $18 M^3$. Using the Lipa experience, a family with ₱300 per month could afford to pay for household water ₱1.00 to ₱1.30 per M^3 in 1976 prices. Families with less income would have less to spend on water, but would be more careful in the use of a lesser quantity.

13.1 Commercial and industrial users are estimated to be able to pay twice as much per M^3 as the average householders. Rates charged such users in some instances show, based on rate comparisons, an even bigger difference in flat rates. It is clear the commercial and industrial users use greater

quantities of water per connection. This suggests the two to one ratio may be used.

13.2 The composite ability of householders and others to pay for water is based upon ₱1.00 to households and ₱2.00 for others. If households are 80 per cent and others 20 per cent of delivered water, the composite repayment ability would be weighted average of payment abilities or ₱1.20 per meter. If this ability is adjusted from 1976 to 1977, it becomes ₱1.34. Enter values, including inflation to 1983, in column 14.

14.0 Ratio of Repayment Ability To Total Costs

Values in column 14 are divided by values in column 13 to obtain the ratio of ability to pay to need to pay. Enter results in column 15.

15.0 Inability of a Community to Meet Repayment Criteria

If a community does not show a margin of repayment capacity over what is required to cover all costs and reserves, it may be that consideration should be given to some change in project design or project financing or both. If many communities fail to show a margin of safety, it may be that the lending program should be re-studied.

16.0 Benefit-Cost and Financial Payment Ability

The two approaches to the study of water districts and water projects concerned themselves with two different aspects of water supply projects. The Benefit-Cost analysis emphasized health and welfare considerations and the national interest in providing

adequate pure water to Philippine citizens, while the financial emphasized costs, amortization of loans and general repayment ability.

It is quite likely that the projects showing the best benefit-cost ratios may also show the best financial capacity. However, this need not be the case and there will probably be many projects which show a better benefit-cost ratio than they show for repayment capacity. When wide differences appear, some serious consideration must be given the values assigned to benefits, the basis for adjusting benefits in the national interest and to other elements in the economic analysis. Likewise, the methods used in financing projects, interest rates charged, repayment requirements and reserve accounts would all need some review.

| Project Years | Inflation Factors | Continuing Costs After Inflation | Loan Amortization Cumulative | Total Costs Before Inflation | Reserves 15% | Requirements Before Replacements | Replacement Funding | Requirements With Funding Replacements | Water Sales M ³ With Projects | | | Total Costs | Estimated Repayment For | Ratio of Capacity to Repayment to Need |
|---------------|-------------------|----------------------------------|------------------------------|------------------------------|--------------|----------------------------------|---------------------|--|--|-----|-------|-------------|-------------------------|--|
| | | | | | | | | | Old | New | Total | | | |
| 1977 0 | 1.000 | 90 | - | - | - | - | - | - | - | - | - | - | - | - |
| 1 1 | 1.120 | 90 | - | - | - | - | - | - | - | - | - | - | - | - |
| 2 2 | 1.125 | 90 | - | 343 | 423 | 75 | 498 | 512 | 1,010 | 198 | 553 | 741 | 1.36 | 1.38 |
| 1980 3 | 1.404 | 160 | - | 433 | 523 | 92 | 615 | 533 | 1,311 | 198 | 688 | 876 | 1.31 | 1.54 |
| 4 4 | 1.574 | 112 | 80 | 542 | 642 | 113 | 755 | 556 | 1,466 | 198 | 830 | 1,018 | 1.29 | 1.70 |
| 5 5 | 1.762 | 120 | 120 | 677 | 869 | 151 | 1,022 | 582 | 1,604 | 198 | 980 | 1,168 | 1.37 | 1.86 |
| 6 6 | 1.974 | 141 | 166 | 1,023 | 1,081 | 191 | 1,272 | 611 | 1,883 | 198 | 1,137 | 1,325 | 1.42 | 2.02 |
| 7 7 | 1.974 | 141 | 219 | 1,023 | 1,383 | 244 | 1,627 | 679 | 2,208 | 198 | 1,297 | 1,485 | 1.49 | 2.18 |
| 8 8 | | 141 | 278 | 1,023 | 1,442 | 255 | 1,697 | 679 | 2,306 | 198 | 1,297 | 1,485 | 1.55 | 2.30 |
| 9 9 | | 141 | 346 | 1,023 | 1,510 | 267 | 1,777 | 679 | 2,376 | 198 | 1,297 | 1,485 | 1.60 | 2.30 |
| 10 10 | | 141 | 422 | 1,023 | 1,586 | 280 | 1,866 | 679 | 2,456 | 198 | 1,297 | 1,485 | 1.65 | 2.30 |
| 11 11 | | 141 | 422 | 1,023 | 1,586 | 280 | 1,866 | 679 | 2,545 | 198 | 1,297 | 1,485 | 1.71 | 2.30 |
| 12 12 | | 141 | 422 | 1,023 | 1,586 | 280 | 1,866 | 679 | 2,545 | 198 | 1,297 | 1,485 | 1.71 | 2.30 |
| 1990 13 | | 141 | 422 | 1,023 | 1,586 | 280 | 1,866 | 679 | 2,545 | 198 | 1,297 | 1,485 | 1.71 | 2.30 |
| 14 14 | | 141 | 422 | 1,023 | 1,586 | 280 | 1,866 | 679 | 2,545 | 198 | 1,297 | 1,485 | 1.71 | 2.30 |
| 15 15 | | 141 | 422 | 1,023 | 1,586 | 280 | 1,866 | 679 | 2,545 | 198 | 1,297 | 1,485 | 1.71 | 2.30 |
| 16 16 | | 141 | 422 | 1,023 | 1,586 | 280 | 1,866 | 679 | 2,545 | 198 | 1,297 | 1,485 | 1.71 | 2.30 |
| 17 17 | | 141 | 422 | 1,023 | 1,586 | 280 | 1,866 | 679 | 2,545 | 198 | 1,297 | 1,485 | 1.71 | 2.30 |
| 18 18 | | 141 | 422 | 1,023 | 1,586 | 280 | 1,866 | 679 | 2,545 | 198 | 1,297 | 1,485 | 1.71 | 2.30 |
| 19 19 | | 141 | 422 | 1,023 | 1,586 | 280 | 1,866 | 679 | 2,545 | 198 | 1,297 | 1,485 | 1.71 | 2.30 |
| 20 20 | | 141 | 422 | 1,023 | 1,586 | 280 | 1,866 | 679 | 2,545 | 198 | 1,297 | 1,485 | 1.71 | 2.30 |
| 21 21 | | 141 | 422 | 1,023 | 1,586 | 280 | 1,866 | 679 | 2,545 | 198 | 1,297 | 1,485 | 1.71 | 2.30 |
| 22 22 | | 141 | 422 | 1,023 | 1,586 | 280 | 1,866 | 679 | 2,545 | 198 | 1,297 | 1,485 | 1.71 | 2.30 |
| 23 23 | | 141 | 422 | 1,023 | 1,586 | 280 | 1,866 | 679 | 2,545 | 198 | 1,297 | 1,485 | 1.71 | 2.30 |
| 24 24 | | 141 | 422 | 1,023 | 1,586 | 280 | 1,866 | 679 | 2,545 | 198 | 1,297 | 1,485 | 1.71 | 2.30 |
| 25 25 | | 141 | 422 | 1,023 | 1,586 | 280 | 1,866 | 679 | 2,545 | 198 | 1,297 | 1,485 | 1.71 | 2.30 |
| 26 26 | | 141 | 422 | 1,023 | 1,586 | 280 | 1,866 | 679 | 2,545 | 198 | 1,297 | 1,485 | 1.71 | 2.30 |
| 27 27 | | 141 | 422 | 1,023 | 1,586 | 280 | 1,866 | 679 | 2,545 | 198 | 1,297 | 1,485 | 1.71 | 2.30 |
| 28 28 | | 141 | 422 | 1,023 | 1,586 | 280 | 1,866 | 679 | 2,545 | 198 | 1,297 | 1,485 | 1.71 | 2.30 |
| 29 29 | | 141 | 422 | 1,023 | 1,586 | 280 | 1,866 | 679 | 2,545 | 198 | 1,297 | 1,485 | 1.71 | 2.30 |
| 30 30 | | 141 | 422 | 1,023 | 1,586 | 280 | 1,866 | 679 | 2,545 | 198 | 1,297 | 1,485 | 1.71 | 2.30 |
| 31 31 | | 141 | 422 | 1,023 | 1,586 | 280 | 1,866 | 679 | 2,545 | 198 | 1,297 | 1,485 | 1.71 | 2.30 |

NOTES: Col. 1 Inflation Factors
 Col. 2 Continuing Costs Inflated to 1983
 Col. 3 Loan Amortization From Subsidiary Table
 Col. 4 O and M Costs Inflated
 Col. 5 15 Per cent Reserves
 Col. 6 Total of Costs Before Funding Replacements
 Col. 7 Amount To Be Funded To Replace Facilities

Col. 8 Total Costs, Including Funding
 Col. 9 Water Delivered By Existing System
 Col. 10 Water Delivered By Project Facilities
 Col. 11 Total Water Delivered With Project
 Col. 12 Total Costs Per Cubic Meter Delivered
 Col. 14 Estimated Repayment Capacity Per Cubic Meter
 Col. 15 Ratio of Repayment Ability To Costs of Delivered Water

INSERT

TABLE 5.0
GAPAN WATER SUPPLY PROJECT
PROJECT COSTS FOR FINANCIAL ANALYSIS
(P1,000)

| <u>Components</u> | <u>July 1, 1976</u> | <u>July 1, 1977</u> | | |
|---------------------|---------------------|---------------------|------------------|--------------------|
| | | <u>Total</u> | <u>Zero Year</u> | <u>Later Years</u> |
| Land | P305 | P342 | P342 | - |
| Wells | 1,400 | 1,568 | 1,568 | - |
| Pumps | 450 | 504 | 504 | - |
| Meters | 1,050 | 1,176 | 583 | 588 |
| Overhaul Pump | 62 | 69 | 69 | - |
| Service Connections | 1,075 | 1,204 | 256 | 948 |
| Fire Hydrants | 834 | 934 | 934 | - |
| Distribution | <u>1,240</u> | <u>1,389</u> | <u>1,389</u> | <u>-</u> |
| Total | P6,416 | P7,186 | P5,650 | P1,536 |

Source: Reconnaissance Study of Gapan 1976 cost estimates adjusted to 1977. Budget divided into first year and later year costs.

TABLE 5.2

GAPAN WATER SUPPLY PROJECT
ESTIMATION OF AMORTIZATION SCHEDULE
(P1,000)

| <u>Project Years</u> | | <u>Loans</u> | | <u>With</u> | <u>Annual</u> | <u>Cumulative</u> |
|----------------------|----|--------------|----------------|-----------------|-----------------|-------------------|
| | | <u>1977</u> | <u>Current</u> | <u>Interest</u> | <u>Payments</u> | <u>Burden</u> |
| 1977 | 0 | 5,650 | 5,650 | | | - |
| 1978 | 1 | 256 | 287 | | | - |
| 1979 | 2 | 256 | 321 | | | - |
| 1980 | 3 | 256 | 360 | | | - |
| 1981 | 4 | 256 | 403 | 7,975 | 80 | 80 |
| 1982 | 5 | 256 | 451 | 405 | 41 | 121 |
| 1983 | 6 | 256 | 505 | 453 | 46 | 167 |
| 1984 | 7 | | | 508 | 52 | 219 |
| 1985 | 8 | | | 569 | 59 | 278 |
| 1986 | 9 | | | 637 | 67 | 345 |
| 1987 | 10 | | | 713 | 77 | 422 |
| | | | | | | ↓ |
| 2008 | 30 | | | | | 422 |
| 2009 | 31 | | | | | - |

Source: Reconnaissance Study of Gapan. Loans are made at the first of each year. Loans are based on costs at the time of construction. Amortization starts after 4 years of interest accumulation at 9 per cent per annum. Repayment is in Principal and Interest, equal annual amounts, sufficient to pay off loans in 30th year.

TABLE 5.1

GAPAN WATER SUPPLY PROJECT
DISTRIBUTION OF COSTS TO CONSTRUCTION YEAR
1977 COSTS IN P1,000

| <u>Project</u> | <u>Years</u> | <u>Basic</u> | <u>Meters</u> | <u>Connections</u> | <u>Totals</u> |
|----------------|--------------|--------------|---------------|--------------------|---------------|
| 1977 | 0 | P4,114 | P 588 | P948 | P5,650 |
| 1978 | 1 | - | 98 | 158 | 256 |
| 1979 | 2 | - | 98 | 158 | 256 |
| 1980 | 3 | - | 98 | 158 | 256 |
| 1981 | 4 | - | 98 | 158 | 256 |
| 1982 | 5 | - | 98 | 158 | 256 |
| 1983 | 6 | - | 98 | 158 | 256 |

Source: Reconnaissance Study of Gapan. Project costs are shown by years to reflect initial major construction and staged construction in later years to match growth in the service area.

TABLE 8.0
GAPAN WATER SUPPLY PROJECT
LIFE EXPECTANCY TABLE
(₱1,000)

| <u>Components</u> | 1977 Prices | | | <u>Total</u> |
|---------------------|----------------|----------------|-------------------|--------------|
| | <u>15 Year</u> | <u>50 Year</u> | <u>Indefinite</u> | |
| Land | | | 342 | 342 |
| Wells | ,568 | | | 1,568 |
| Pumps | 504 | | | 504 |
| Meters | 176 | | | 1,176 |
| Overhaul Pump | 69 | | | 69 |
| Service Connections | | 1,204 | | 1,204 |
| Fire Hydrants | | 934 | | 934 |
| Distribution | --- | <u>1,389</u> | --- | <u>1,389</u> |
| Total | 3,317 | 3,527 | 342 | 7,186 |

Source: Reconnaissance Study of Gapan. Life expectancy from table of life expectancy used by CDM.

TABLE 8.0.1

GAPAN WATER SUPPLY PROJECT
REPLACEMENT BUDGET, 15 YEAR ITEMS
(P1,000)

| <u>Components</u> | <u>1977 Prices</u> | | | | | | |
|-------------------|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | <u>1977</u> | <u>1978</u> | <u>1979</u> | <u>1980</u> | <u>1981</u> | <u>1982</u> | <u>1983</u> |
| Wells | 1,368 | | | | | | |
| Pumps | 504 | | | | | | |
| Meters | 588 | 98 | 98 | 98 | 98 | 98 | 98 |
| Overhaul Pump | <u>69</u> | — | — | — | — | — | — |
| Total | 2,729 | 98 | 98 | 98 | 98 | 98 | 98 |

| <u>Current Prices</u> | | | | | | | |
|-----------------------|-----------|-----|-----|-----|-----|-----|-----|
| Wells | 1,368 | | | | | | |
| Pumps | 504 | | | | | | |
| Meters | 588 | 110 | 123 | 138 | 154 | 173 | 193 |
| Overhaul Pump | <u>69</u> | — | — | — | — | — | — |
| Total | 2,729 | 110 | 123 | 138 | 154 | 173 | 193 |

Source: Reconnaissance Study of Gapan Reflects Life Expectancy and Timing of Construction.

TABLE 8.0.2

GAPAN WATER SUPPLY PROJECT
ESTIMATION OF FUNDING REQUIRED
TO REPLACE COMPONENTS IN 16TH YEAR

| | | Value of Replacement | | Funding | |
|------|----|----------------------------------|---------------|------------------------|-------------|
| | | <u>1977</u> <u>Originally</u> | <u>Factor</u> | <u>Value 16th Year</u> | <u>Each</u> |
| 1977 | 0 | ₱ 2,729 | 5,504 | - | - |
| 1978 | 1 | 110 | | 512 | 512 |
| 1979 | 2 | 123 | | 21 | 533 |
| 1980 | 3 | 138 | | 23 | 556 |
| 1981 | 4 | 154 | | 26 | 582 |
| 1982 | 5 | 173 | | 29 | 611 |
| 1983 | 6 | 193 | | 32 | 643 |
| 1984 | 7 | | | 36 | 679 |
| 1985 | 8 | | | | |
| 1986 | 9 | | | | |
| 1987 | 10 | | | | |
| 1988 | 11 | | | | |
| 1989 | 12 | | | | |
| 1990 | 13 | | | | |
| 1991 | 14 | | | | |
| 1992 | 15 | | | | 679 |
| 1993 | 16 | | | 15,020 | 167 |
| 1994 | 17 | | | 605 | 146 |
| 1995 | 18 | | | 677 | 123 |
| 1996 | 19 | | | 760 | 97 |
| 1997 | 20 | | | 848 | 68 |
| 1998 | 21 | | | 952 | 36 |
| 2000 | 22 | | | 1,062 | 0 |

Source: Based on Replacement Table

TABLE 11.0

GAPAN WATER SUPPLY PROJECT
VOLUME OF WATER DELIVERED BY PROJECT
(Total Water Volumes in 1,000 M³)

| <u>Project Years</u> | <u>Popu- lation</u> | <u>Annual Demand</u> | | <u>Less Old</u> | <u>Net Delivered</u> |
|--------------------------|-------------------------|----------------------|--------------|-----------------|--------------------------|
| | | <u>Per Capita</u> | <u>Total</u> | | |
| 1977 0 | 27.6 | 23.6 M ³ | 650.0 | 188 | - |
| 1978 1 | 29.0 | 25.5 | 740.9 | ↓ | 552.9 |
| 1979 2 | 30.0 | 29.2 | 876.0 | | 688.0 |
| 1980 3 | 31.0 | 32.8 | 1,018.3 | | 830.3 |
| 1981 4 | 32.0 | 36.5 | 1,168.0 | | 980.0 |
| 1982 5 | 33.0 | 40.1 | 1,324.9 | | 1,136.9 |
| 1983 6 | 33.9 | 43.8 | 1,484.8 | 188 | 1,296.8 |
| 1984 7 | | | | | 1,296.8 |

Source: Gapan Reconnaissance Study

ASSESSMENT OF WATER DISTRICT INSTITUTIONAL CAPABILITY

During the initial three years of LWUA operations, 30 water districts have been formed. The degree of institutional development of these districts varies. Many districts have made considerable progress while others have virtually stood still. The degree of development generally reflects the capability of the key staff members of the water districts, and its Boards of Directors. In recognition of the importance of having motivated and qualified personnel involved in water district operations, the LWUA is taking a more active role in promoting high standards, modern screening methods and competitive salary structures for all water district personnel. At the same time, LWUA training activities are being expanded to meet the obvious need.

The status of water district institutional development is summarized as follows:

1. GENERAL

The Districts are to a great extent removed from local politics. Even though the boards are appointed by the local mayors or governors, the boards seem to have developed allegiance to the water systems and have in many instances opposed the wishes of other government agencies to protect the best interests of the districts.

Most districts seem to have developed an identity of their own. From interaction with other districts at various meetings and as a result of LWUA's training efforts, the districts seem to recognize the important role they are to play within their community. The managers and board members are generally well known and active within their communities and are able and willing to promote their district and its programs.

All the districts have qualified for a Conditional Certificate of Conformance issued by the LWUA. These have been issued as evidence that the districts meet certain initial standards and have programmed certain improvements to achieve required higher levels of development.

2. FINANCIAL MANAGEMENT

Comprehensive commercial practices and management information systems have been developed by the LWUA. The new systems have been installed in eight districts and installation is continuing at a rate of one per month. The new systems are greatly improving the district's ability to control their total financial structure, particularly the billing and collection efforts. It is not uncommon now for a district to achieve in excess of 80% collection efficiency, where in the past it would be on the order of 30-40 percent. The new reporting systems also provide the Manager and the Board of Directors timely financial information which allow early recognition of problem areas.

A recent LWUA program requires the water districts to prepare and submit 10-year projections of cash flow. This forces the districts to calculate anticipated future water rates and plan for realistic rate increases well ahead of revenue requirements. Four districts have prepared such plans acceptable to the LWUA.

The overall financial condition of the water districts varies from very poor to excellent. The key factor is the willingness of the district management to collect water bills. Where the district management has taken a hard-line approach, the results have been extremely promising. Another factor is the willingness of the district boards to raise water rates to realistic levels. The most common argument against diligent collection efforts and higher water rates is the present very low level of service in many of the districts. Some districts would rather improve service prior to making a real effort at collecting bills and increasing rates.

3. PERSONNEL MANAGEMENT

District Board members have, in the majority, developed a healthy attitude relative to board-manager relationship. Some members still attempt to "run everything" and make all decisions on a personal and a case-by-case basis, but the majority seem to realize that the establishment of sound policy to be implemented by management is more effective.

Delegation of authority is slowly taking place throughout the district heirarchy whereas in the past literally all decisions were made by one individual. As an example, district managers may

approve purchases up to some limit without the approval of the board, heads of commercial departments may adjust water bills without the manager's approval, and storekeepers may requisition replacement items without further approval when stores get low.

Many managers are making sincere efforts to surround themselves with competent, hard working supervisory personnel. This is often difficult due to the ingrained culture which places more importance on the maintenance of smooth interpersonal relationship rather than risk confrontation.

The LWUA has developed and made available to the districts sample job descriptions, desirable salary rates and personnel rules and regulations. These have in some cases been adopted as submitted, sometimes revised and adopted and in some cases totally ignored. Overall, however, the trend is towards a more organized and logical approach to personnel management.

4. PHYSICAL RESOURCES MANAGEMENT

To date the major emphasis of the LWUA program has been on improving the quality of the personnel at the water district level and improving the district's financial position. The theory being that well qualified and motivated people with financial resources can resolve the remaining district problems.

Since no major physical improvements have yet been completed as part of the LWUA program, practically all the districts have serious physical resource deficiencies which minimize opportunities for significant improvement of service to the customers.

At the five pilot water district and several other districts which have received more concentrated assistance from the LWUA some improved capability has been developed, particularly in operation of the existing facilities. Water production can now be measured more accurately and the efficiency of the machinery determined. These districts are also more aware of the water quality aspects of water supply and disinfection capabilities as well as quality monitoring has improved.