Republic of the Philippines
Department of Public Works and Highways
OFFICE OF THE SECRETARY

097.13 DPWH
4-20-89

13 April 1989

DEPARTMENT ORDER)
NO. 41 Series of 1989
x-x-x-x-x-x-x-x-x-x

SUBJECT: RA 6716 IMPLEMENTING GUIDELINES (ACCELERATED WATER SUPPLY PROGRAM)

With the enactment into law of Republic Act 6716, "AN ACT PROVIDING FOR THE CONSTRUCTION OF WATER WELLS, RAINWATER COLLECTORS, DEVELOPMENT OF SPRINGS AND REHABILITATION OF EXISTING WATER WELLS IN ALL BARANGAYS IN THE PHILIPPINES", the Department is vested with the responsibility to construct and/or rehabilitate at least one (1) Level I (point source) system in each barangay of the Philippines. The total physical target envisioned under the Act is the construction and rehabilitation of 100,000 Level I systems, like shallow and deep wells, developed springs and rainwater collectors. In view of the necessity of the projects, the Act stipulates that these undertakings shall be completed by June 30, 1991.

Considering the magnitude of the program and in order to facilitate and hasten its effective and efficient implementation, this set of guidelines, called RA 6716 IMPLEMENTING GUIDELINES (ACCELERATED WATER SUPPLY PROGRAM), is hereby promulgated for the guidelines and compliance of all concerned.

Should there be new issues or inconsistencies that will arise out of these new guidelines, the PMO for Rural Water Supply should be informed so that these issues can be assessed and given proper solutions including guideline revisions or clarifications, if necessary.

This Department Order revokes or modifies all previous orders and issuances inconsistent with these guidelines and shall take effect immediately.

FIORELLO R. ESTUAR
Secretary

Organizing and training the recipient communities in the operation and maintenance of water systems shall be conducted by the DPWH prior to the turnover of such facilities to the BWSA subject to the guidelines to be formulated by the Department.

SEC. 4. *Submission of Report.* — The Department of Public Works and Highways shall, within ninety (90) days after the approval of this Act and every one hundred eighty (180) days thereafter, submit periodic reports to the respective Committees on Public Works and Highways of both Houses of the Congress of the Philippines for evaluation and consideration.

SEC. 5. *Funding.* — The sum needed for the implementation of the construction, rehabilitation and repair program shall be taken from any available appropriations for the Department of Public Works and Highways in the General Appropriations Act for 1989: *Provided*, That funds for this purpose shall also be included in the General Appropriations Act for 1990 and 1991: *Provided, further*, That the total program shall be completed not later than June 30, 1991, and: *Provided, finally*, That there shall be equitable and proportionate appropriations of funds annually for this purpose for all provinces, cities and municipalities. In addition, a portion of financial grants and concessional loans extended to the Philippines by foreign governments and multilateral agencies every year, the amount to be determined by the President, shall be allocated by the Department of Budget and Management to augment the appropriations of the Department of Public Works and Highways until one hundred thousand (100,000) water wells, rainwater collectors, and springs are completed as envisioned in this Act.

SEC. 6. *Effectivity.* — This Act shall take effect upon its publication in at least two (2) newspapers of general circulation.

Approved,

JOVITO R. SALONGA
President of the Senate

RAMON V. MITRA
Speaker of the House of Representatives

This Act which is a consolidation of House Bill No. 3282 and Senate Bill No. 504 was finally passed by the House of Representatives and the Senate on March 2, 1989 and February 28, 1989, respectively.

EDWIN P. ACOBA
Secretary of the Senate

QUIRINO D. ABAD SANTOS, JR.
Secretary of the House of Representatives

Approved: March 17, 1989

CORAZON C. AQUINO
President of the Philippines

O

S. No. 504

Republic of the Philippines
Congress of the Philippines
Metro Manila

Second Regular Session

Begun and held in Metro Manila, on Monday, the twenty-fifth day of July, nineteen hundred and eighty-eight.

[REPUBLIC ACT NO. 6716]

AN ACT PROVIDING FOR THE CONSTRUCTION OF WATER WELLS, RAINWATER COLLECTORS, DEVELOPMENT OF SPRINGS AND REHABILITATION OF EXISTING WATER WELLS IN ALL BARANGAYS IN THE PHILIPPINES

Be it enacted by the Senate and House of Representatives of the Philippines in Congress assembled:

SECTION 1. *Declaration of Policy.* — It is hereby declared to be the national policy to promote the quality of life of every Filipino through the provision of adequate social services including, but not limited to, the provision of adequate potable water supply made conveniently available to every barangay in the country.

SEC. 2. *Water Wells, Rainwater Collectors and Spring Development.* — The Department of Public Works and Highways (DPWH) shall, within thirty (30) days after the approval of this Act, undertake construction of water wells, rainwater collectors, development of springs and rehabilitation of existing water wells in all barangays in the Philippines in such number as may be needed and feasible, taking into consideration the population, hydrologic conditions, costs of project development and operations, financial and economic factors and institutional arrangements: *Provided, however,* That the DPWH shall deduct not more than five percent (5%) for supervision, engineering, technical and other overhead expenses or fees: *Provided, further,* That each barangay in the country shall have at least one additional potable water source.

SEC. 3. *Operation and Maintenance.* — In order to ensure the proper use of the water facilities herein provided, a Barangay Waterworks and Sanitation Association, herein referred to as BWSA, shall be formed and organized for the purpose of maintaining the water facilities: *Provided,* That pending the organization of the BWSA, the water facilities shall be operated and maintained by the barangay council.

The BWSA shall be composed of the member-consumers who shall administer, operate and maintain the completed water facility and shall be registered with the corresponding municipal or city council.

The BWSA may impose such minimal charges as may be necessary for the maintenance and normal repairs of said facility. Nothing herein shall prevent any resident of the locality from using the water facility under the same terms and conditions as the member-consumers of the BWSA.

Republic of the Philippines
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
OFFICE OF THE SECRETARY
Bonifacio Drive, Port Area, Manila

097.7 DPWH
4-3-89

RECD. APR. 3, 1989
4:20 p.m.

30 March 1989

DEPARTMENT MEMORANDUM)

CIRCULAR NO. 22
Series of 1989

TO ALL : Undersecretaries
Assistant Secretaries
Bureau Directors
Project Managers
Service Chiefs
District and City Engineers
Others Concerned

Attached, for their information, guidance, and reference, is a copy of Republic Act No. 6716, dated 17 March 1989, from the Office of the President, Malacanang, Manila, entitled: **"AN ACT PROVIDING FOR THE CONSTRUCTION OF WATER WELLS, RAINWATER COLLECTORS, DEVELOPMENT OF SPRINGS AND REHABILITATION OF EXISTING WATER WELLS IN ALL BARANGAYS IN THE PHILIPPINES."**

For dissemination to, and compliance of, all concerned.

FIORELLO R. ESTUAR
Secretary

Republic of the Philippines
Department of Public Works and Highways

RA 6716
IMPLEMENTING GUIDELINES

(Accelerated Water Supply Program)

April 1989

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I. BACKGROUND

The population of the Philippines in 1987 was estimated at 53 million. Of this, about 8.16 million or 14% reside in Metro Manila; 15.37 million or 27% in provincial urban areas and 33.83 million or 59% are in the rural areas.

Of the country's population, about 63% have access to water supply. The service coverage is 86% in Metro Manila, 55% in provincial urban areas and 62% in the rural areas.

Given this situation, the House of Representatives introduced House Bill No. 3282 and on the part of the Senate, Senate Bill No. 504. Both bills are geared to provide adequate social services to every Filipino, particulary through safe water supply. These two bills carry an almost similar title, "AN ACT PROVIDING FOR THE CONSTRUCTION OF WATER WELLS AND RAIN-WATER COLLECTORS, DEVELOPMENT OF SPRINGS AND REHABILITATION OF EXISTING WATER WELLS IN ALL BARANGAYS IN THE PHILIPPINES." The joint Conference Committee of Congress agreed to combine the two Bills. And on March 17, 1989 President Corazon C. Aquino signed Republic Act 6716 which in effect operationalizes the Bills.

The law carries with it the mandate for the Department of Public Works and Highways (DPWH) to provide for the immediate construction and rehabilitation of 100,000 Level I systems or point sources covering all the barangays in the Philippines until June 1991. At least one Level I system should be provided for every barangay.

The projects will directly benefit 15 million water-users especially in the rural areas. This will considerably improve the health condition of the Filipino people as the incidence of water-borne and related diseases will be decreased, if not eradicated.

A formidable task lies ahead for the DPWH. The importance of developing and establishing implementation guidelines and control mechanisms is to ensure the success of this accelerated water supply program.

II. OBJECTIVES

General:

To provide direction and control in the implementation of the accelerated water supply program.

Specific:

1. To provide the project implementors with clearer understanding about the mechanics of implementing the program.

2. To ensure the realization of the program targets of 100,000 Level I (point source) systems and at least one Level I facility per barangay.

3. To ensure that the water systems are properly operated and maintained through the systematic and effective organization of Barangay Waterworks and Sanitation Associations (BWSAs), administration of training programs, the distribution and proper dissemination of a Level I Operation and Maintenance Manual to each barangay, and the provision of follow-up services.

III. COVERAGE

These guidelines cover the implementation arrangements on the following:

a. provision of Level I water service or point source facilities like wells, developed springs, and rainwater collectors, and the rehabilitation of existing wells,

b. organizational structure and corresponding areas of responsibility,

c. reporting requirements, and

d. financial procedures and requirements.

The program package includes the construction of 46,613 deep wells; 33,795 shallow wells; 195 free flowing wells and 992 rainwater collectors; the development of 7,530 springs; and the rehabilitation of 10,875 existing project sources. It also includes the formation and registration of Barangay Waterworks and Sanitation Associations (BWSA); and the administration of training programs that are envisioned to strengthen the existing institutions.

IV. TIMEFRAME

The implementation of the accelerated water supply program will start on 20 March 1989 and shall be completed on or before 30 June 1991.

V. ORGANIZATION AND MANAGEMENT

5.1 Organizational Structure

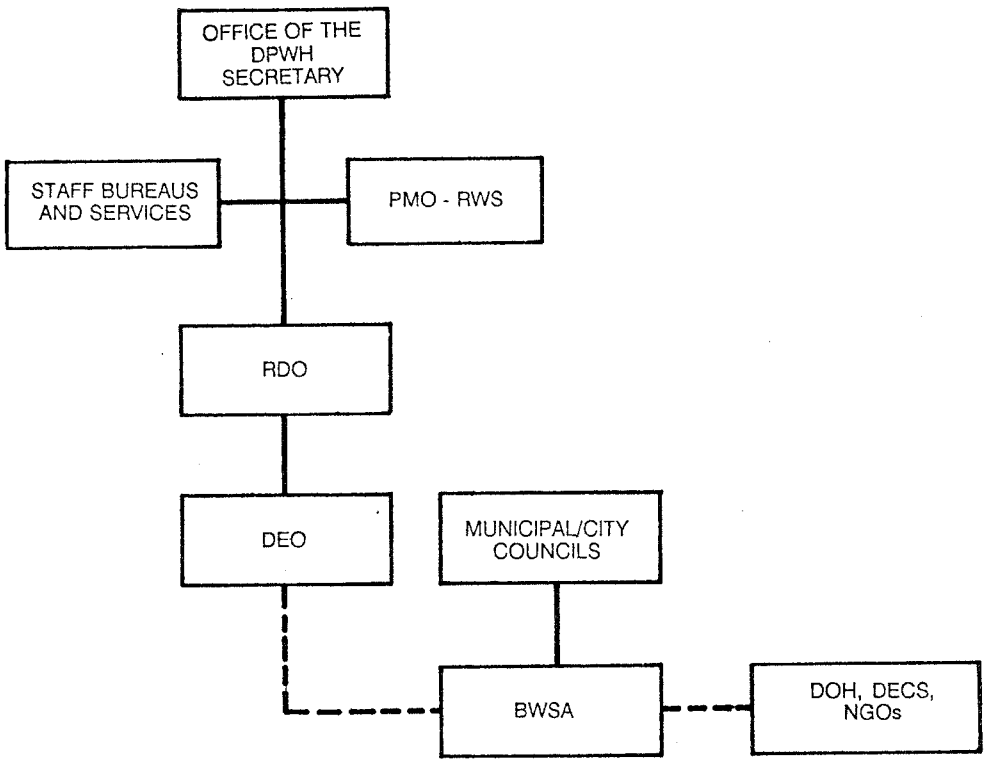


Figure 1

LEGEND: DPWH - Department of Public Works and Highways

PMO-RWS - Project Management Office for Rural Water Supply

RDO - Regional Director's Office

DEO - District Engineer's Office

BWSA - Barangay Waterworks and Sanitation Association

DOH - Department of Health (Midwives, Barangay Health Workers, Rural Sanitary Inspectors)

DECS - Department of Education, Culture and Sports

NGOs - Non-Government Organizations

5.2 Barangay Waterworks and Sanitation Association (BWSA)

A Barangay Waterworks and Sanitation Association (BWSA) shall be formed in each barangay and shall be composed of the consumer-members. It shall be registered with the corresponding municipal or city councils.

The BWSA shall own, operate and maintain the water supply facility or facilities.

Appropriate training shall be extended to the BWSA.

Minimal charges shall be imposed by the BWSA to its consumer-members to cover the maintenance and repair costs of the facilities.

5.3 Municipal and City Councils

For practical purposes and convenience, the BWSA shall be registered with the corresponding municipal and city councils.

As part of the data management system, the municipal and city council shall furnish DPWH, on a quarterly basis, complete registration statistics.

5.4 Regional and District/City Offices

The regional and district/city offices of DPWH shall construct the water systems, install the water facilities, and rehabilitate existing ones.

The usual monthly periodic reports must be submitted by the district offices through the regional offices to the Office of the Project Manager, PMO-RWS, copy furnished, Bureau of Construction every 15th day of each month to be marked as follows:

The Project Manager
Project Management Office for Rural Water Supply
Department of Public Works and Highways
2nd Street, Port Area
Manila

Subject: Accelerated Water Supply Program

The regional office will designate one full-time senior engineer to undertake monitoring and evaluation of projects being implemented by the district offices. The said engineer shall be ably assisted by a senior engineer of the PMO-RWS.

The district/city offices shall initiate the formation of a BWSA. Through the Senior Manpower Development Officers (SMDOs), Manpower Development Officers (MDOs), and district/city personnel officers, they shall assist the community members in the formation and registration process. Likewise, they shall conduct training programs.

They shall constantly collaborate with the PMO-RWS on all aspects of project implementation.

5.5 Staff Bureaus and Services

The Staff Bureaus and Services shall perform the usual functional supervision over the regional and district/city offices.

5.6 Project Management Office for Rural Water Supply (PMO-RWS)

The PMO-RWS shall provide overall direction and supervision for the accelerated water supply program.

Through the PMO-RWS, the DPWH shall submit quarterly reports to both houses of the Congress.

Monthly field reports shall be consolidated and synthesis thereof shall be submitted to the Secretary. A copy of the monthly reports shall be submitted to the Assistant Secretary for Project Monitoring.

The PMO-RWS shall provide a network in the administration of a massive training program nationwide.

It shall coordinate with appropriate Non-Government Organizations (NGOs) in terms of the type and extent of assistance to be provided by such NGOs.

It shall extend technical and institutional assistance to all regional and district/city offices. One (1) engineer shall be designated in every region to assist in the monitoring and evaluation of water supply projects in the region.

5.7 Department of Health (DOH) and Department of Education, Culture and Sports (DECS)

The DOH and DECS shall provide institutional assistance to the RWSAs during the formation phase, and the operation and maintenance phase. Such assistance shall be extended by the midwives, barangay health workers and rural sanitary inspectors, for DOH, and the teachers, for DECS.

In addition, they will monitor the operations of the BWSAs.

5.8 Non-Government Organizations (NGOs)

All eligible NGOs can participate in the implementation of projects. However, proper coordination with the PMO-RWS must be established in order that efforts are properly orchestrated.

The areas of participation can be any one or combination of the following:

a. project identification
b. attendance and observation of public biddings
c. providing information or feedbacks about malpractices of government officials
d. administration or assistance in training programs, and
e. financing minor repair works or in the rehabilitation of water facilities and the construction of water systems.

VI. IMPLEMENTATION DETAILS

6.1 Program Management and Project Development Models, and Institutional Development Model

The Program Management Model presented in Figure 2, Project Development Model shown in Figure 3 and Institutional Development Model (Figure 4) will be adhered to by all concerned.

The Program Management Model presents in detail the different activities to be undertaken in all phases of project implementation which include project preparation, pre-construction and post-construction activities. The Project Development Model defines the detailed activities and the relationships of the activities to be undertaken by the concerned offices under the DPWH and other government and non-government agencies involved in the implementation of a rural water supply project. The Institutional Development Model describes the institutional details of the program.

6.2 Procedure in Requesting a Project

A water supply project can be availed through any of the following methods:

(a) a simple request-letter from an individual or a group of persons in need of a Level I facility or from concerned individuals;
(b) a resolution from the barangay/municipal council, and
(c) as identified by the district/city office in the course of its survey, inspection or community need assessment.

Thus, project identification can emanate from the Barangay Councils, District/City Engineer's Office, any civic organization in the community, or from the community itself.

Figure 2

ACCELERATED WATER SUPPLY PROGRAM MANAGEMENT MODEL

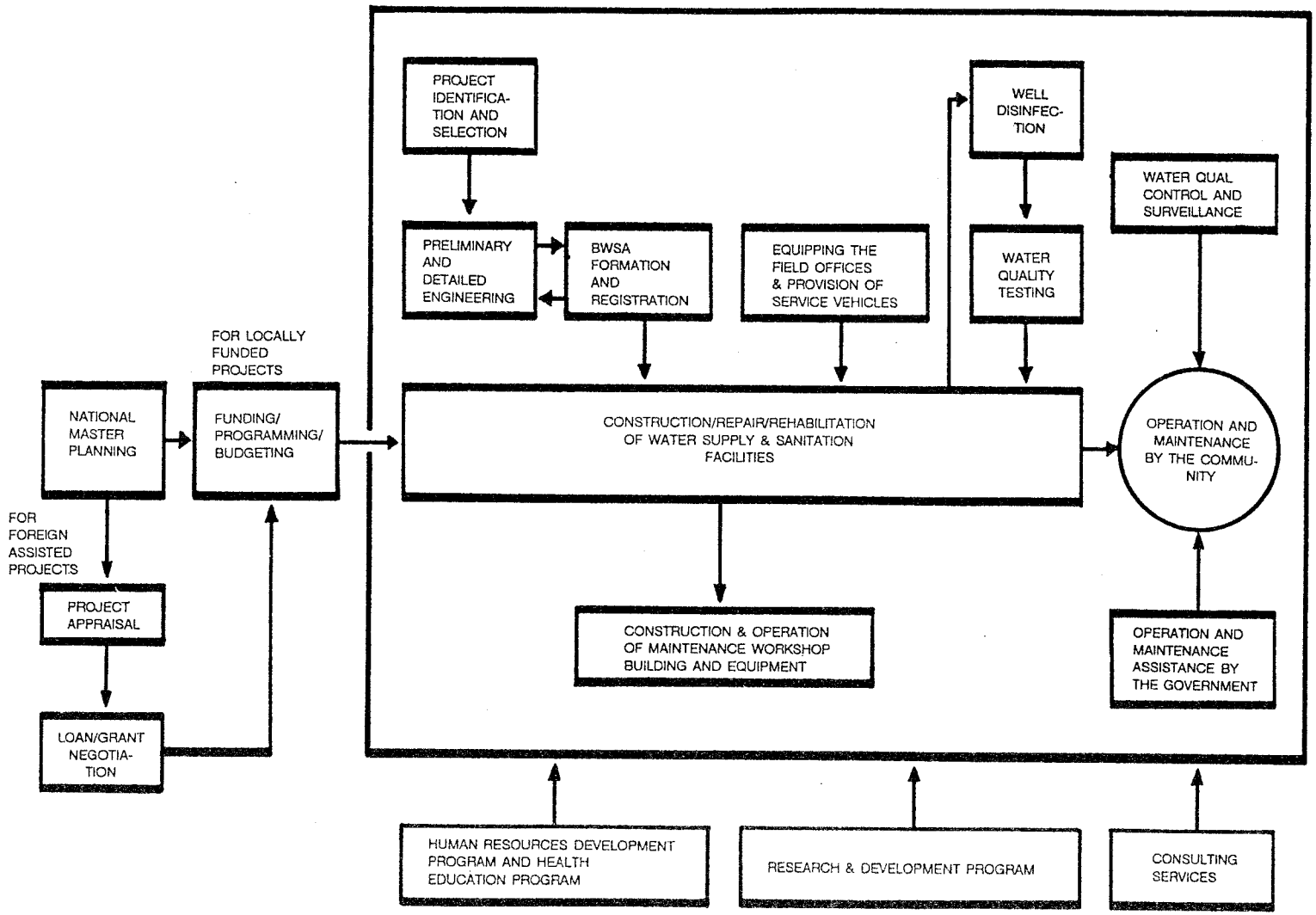


FIGURE 3

PROJECT DEVELOPMENT MODEL

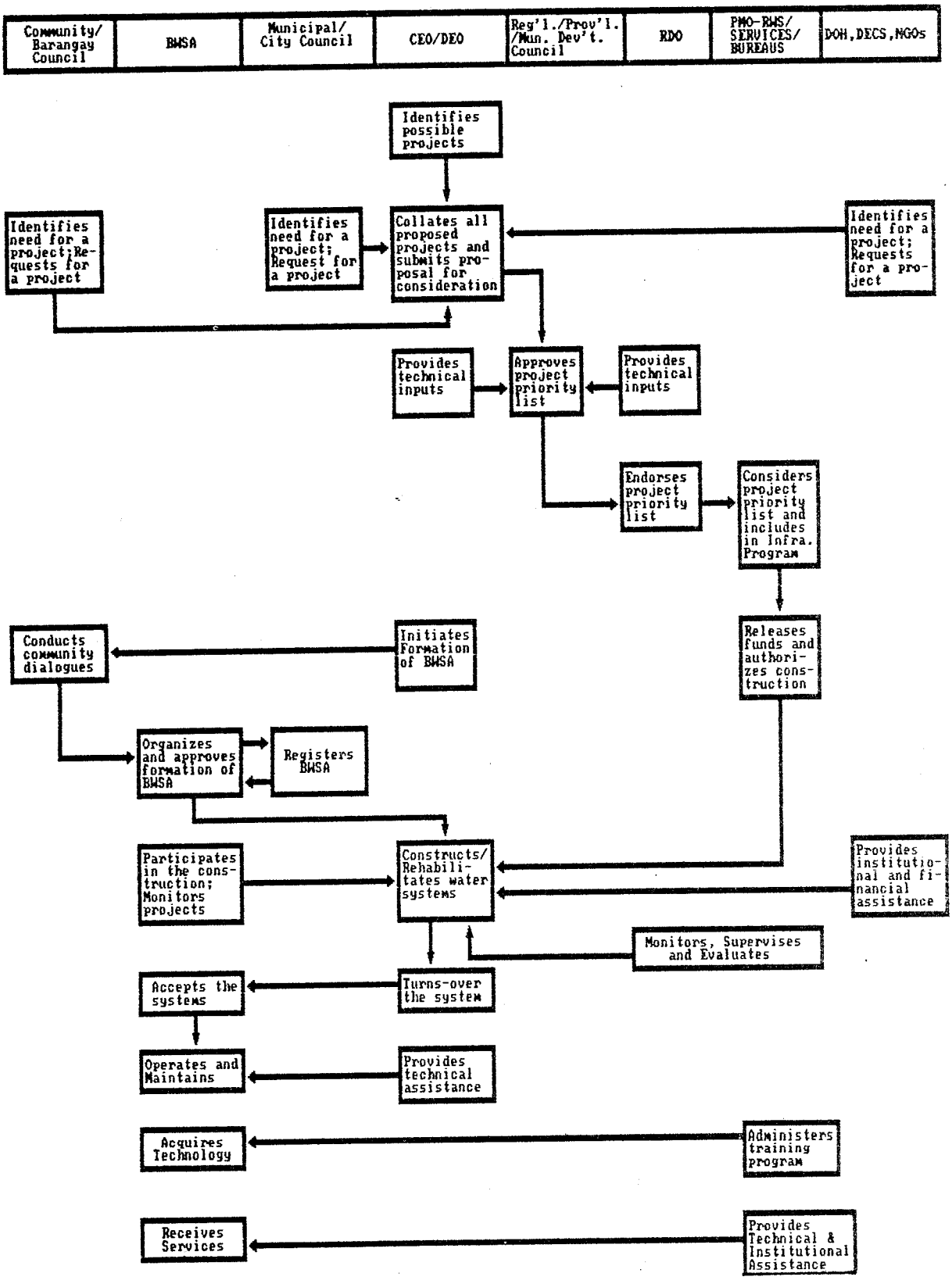
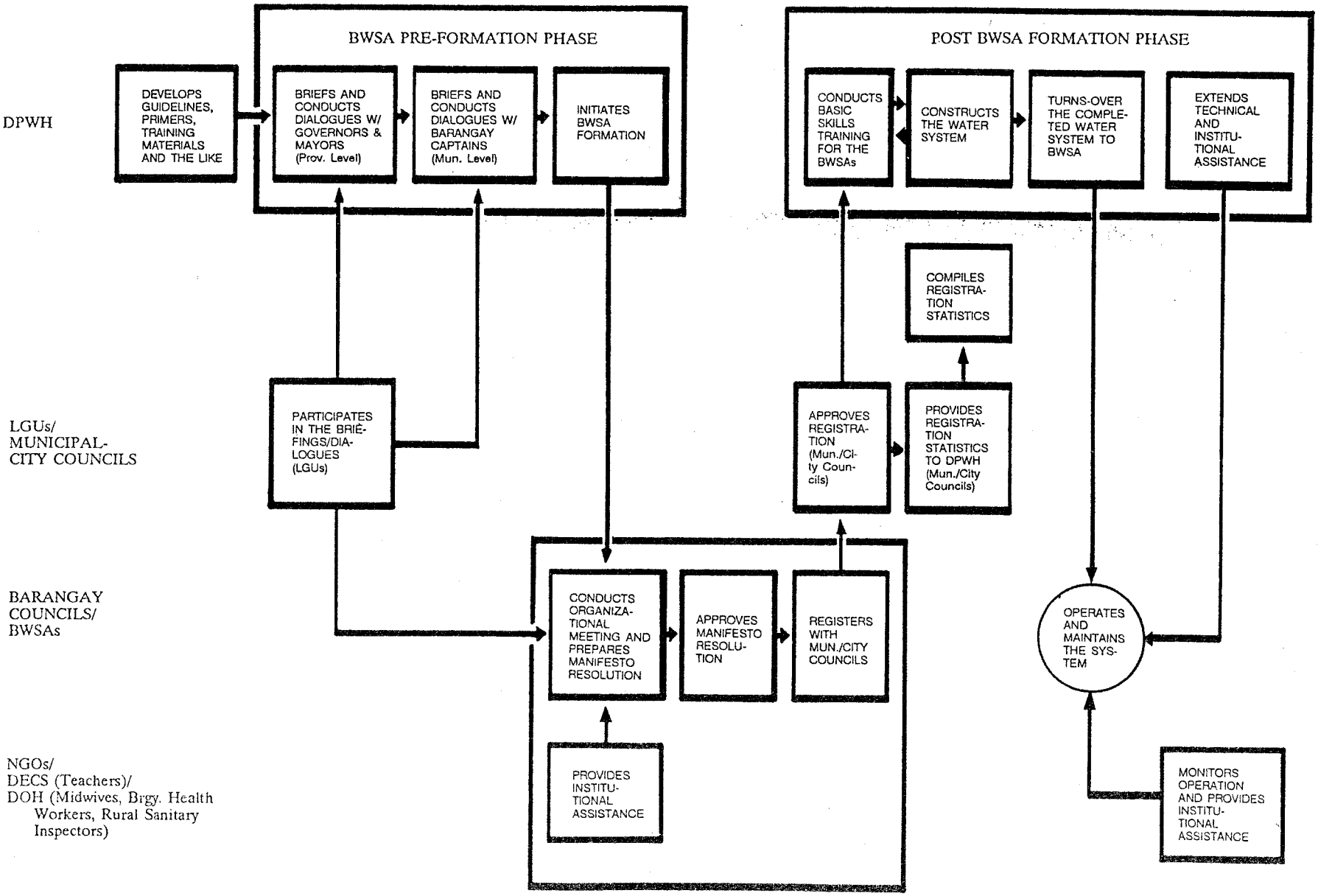


Figure 4
INSTITUTIONAL DEVELOPMENT MODEL



All proposed projects within the municipality will then be evaluated by the municipal development council, results of which will be submitted to the provincial development council. Then the provincial development council will prioritize the proposed water supply projects of the province, which will be based on the criteria indicated under item 6.3 and will be concurred by the Regional Development Council (RDC). Subsequently, the RDC's recommendation will be endorsed to the PMO-RWS, for collation and inclusion in the regular or supplemental program for water supply. The PMO-RWS will coordinate with the Planning Service for purposes of programming water supply projects.

6.3 Criteria in the Identification and Selection of Projects

In the identification and selection of projects, all barangays should be provided with at least one Level I system.

As a guide in the prioritization of projects (i.e., projects for inclusion in the 1989, 1990 and 1991 Infrastructure Program for Water Supply) the following criteria shall be applied:

A. Community Commitment

As a prerequisite to the financing and undertaking of a water supply project, the prospective beneficiary households must signify their intention to form themselves into a Barangay Waterworks and Sanitation Association (BWSA) and to discharge the responsibilities expected from such formation. This means a commitment and capacity for the BWSA to collect minimal monthly fees that would cover operating and maintenance expenditures.

B. Inadequacy of the Existing Water Supply System

"Inadequacy" in this context covers not only insufficient water quantity, but also the distance of water source from the households. It also means water source unreliability during the dry season, and poor water quality.

The water supply in a community should be sufficient to supply the minimum daily water requirements of the residents for drinking, washing, bathing and other domestic needs. For this purpose, a minimum per capita requirement of 30 liters per day is set. Each household should be within 250 meters from a water source. The water system should be free from disease-carrying organisms. For prioritization for improvements, communities with large deviations from these minimum requirements shall have higher priorities, particularly those that do not have a Level I system.

C. Prevalence of Water-Related Diseases

This is related to the "inadequacy" criteria. Diseases such as gastro-enteritis, dysentery, cholera,

typhoid and hepatitis are due to the lack of adequate and potable water supply. Data on mortality rates caused by these diseases may be obtained from the Department of Health. Communities with a high incidence of these diseases will receive preferential attention when it comes to selecting water supply projects.

D. Community Development Level and Potential

Other things being equal, poor or depressed areas with economic potentials shall be given priority for water supply development. The average family income could be used as an index for this factor.

E. Capital

Projects which entail a low capital cost per capita to be served for a given level of service will be given preferential attention. More densely populated communities will generally require a lower per capita investment. The effects of costs of the type of source and its distance from the community are also important. Groundwater from springs and wells which requires little or no treatment to make it safe is preferable over surface water. Whenever possible, shallow well shall be preferred over the more expensive deep wells.

6.4 Hydrogeologic Information

To be used as a guide in the design of a well, particularly in the determination of static water level and well depth is a technical report prepared by the National Water Resources Board and a hydrogeologic data base compiled and interpreted by the PMO-RWS. Both of these reports will be distributed along with these guidelines.

6.5 Typical Level I Designs, Specifications and Programs of Work

All concerned parties must be guided by the following:

(a) Level I Designs - The standard designs namely: modified shallow well, intermediate wells, traditional and modified deep wells, free flowing wells, developed springs and rainwater collectors, as indicated in the typical Programs of Work will be adhered to.

(b) Specifications - Specifications for the materials to be used in the water supply facilities will be furnished along with these guidelines.

(c) Typical Programs of Work - For reference, the Typical Program of Work previously furnished the DEOs/CEOs will be used. However, an updated set of Typical Programs of Work will be distributed.

TABLE 1
APPLICABILITY OF LEVEL I DESIGNS

LEVEL I DESIGN	APPLICATION/S
Shallow Well	Suitable in areas where the water level is not more than 6 meters (20') below ground surface. It is also applicable in places where people fetch water in containers for their requirements.
Intermediate Well	Applicable in areas where the water level is below 6 meters (20') and with average cylinder setting of 25 meters (82').
Deep Well (Modified)	Suitable in areas where water level is lower than 30 meters (98') and with average cylinder setting of 40 meters (130'). Also applicable in areas where the water system may eventually be converted into a communal faucet system (Level II).
Deep Well (Standard)	Suitable in coastal areas where Modified Deep Well Handpump is susceptible to corrosion and water level is lower than 30 meters (98'). Also applicable in areas where the water system may eventually be converted into a communal faucet system (Level II).
Type A Spring Box	Adaptable where the spring is located on a downhill slope.
Type B Spring Box	Adaptable where the spring water is gushing out on an almost ground level.
Type C Spring Box	Adaptable where the spring box is located inside a cavern.
Type D Spring Box	Adaptable where the springs are scattered on a high elevation which require a large intake to enclose them.
Type E Spring Box	Adaptable where the spring is located below an over-hanging rock.

The applicability of the various Level I designs are presented in Table 1. Depending on factors like hydrogeologic condition, topography, demographic patterns and the like, the appropriate design or technology shall be selected.

6.6 Priorities in Repair and Rehabilitation Projects

The order of priorities in the repair and rehabilitation of projects shall be as follows:

(a) Minor repairs (15% or less than the new construction cost) of wells in areas where there are no other sources of water supply within the immediate vicinity.

(b) Minor repair of wells in areas wherein there are alternative sources of water supply.

(c) Major repairs of wells (16% to 50% of the new construction cost).

(d) Rehabilitation of wells (51% to 80% of the new construction cost).

6.7 Well Abandonment

Wells beyond economic repair (cost is about 81% of the new construction cost or more) should be abandoned rather than rehabilitated; but subject to immediate replacement. In such a case, the following procedure should be followed:

(a) notify the BWSA or the community of the proposed action,

(b) retrieve serviceable parts,

(c) seal the well appropriately, and

(d) program the immediate construction of a new well to replace the old well.

6.8 Formation and Registration of BWSA

The organization of a BWSA should be viewed as a mandatory requisite for the success of the program. A well organized BWSA should not be undermined by both the community and its implementors to ensure the viability and sustainability of the water supply facility.

To achieve this, BWSA formation activities will be divided into three phases, namely: Pre-formation Process, Formation Process and Post-formation Process.

A. Pre-formation Process

The pre-formation process, which is a preparatory stage prior to actual formation, is recommended to enable the potential BWSA members to understand the facility's benefits, features and the responsibilities attached to its acquisition.

The process is basically an information dissemination through pre-formation meetings and consultation with the municipal mayors and barangay captains which will be done on separate occasions.

B. Formation Process

This is the process where community interest and commitment are stimulated. This includes all the activities to be undertaken in the formation and recognition of the organization (BWSA).

In this process, community members will be organized in coordination with the barangay captain, through a membership organizational meeting. The Board of Directors and Officers will be elected from among the potential BWSA members. Towards the end of this meeting, the members should be fully aware of their roles and responsibilities both as an organization and as members of the organization.

The newly elected officers of the proposed BWSA should register the BWSA to give it a legal personality. A Manifesto Resolution (Appendix 1) must be prepared and accomplished for the purpose of registration. This registration will be submitted for approval to the Municipal/City Council where the BWSA will thus be officially registered.

C. Post-formation Process

This is the stage where the BWSA is equipped with the technical management skills to competently operate, maintain and sustain the system. Since the officials of the BWSA are assumed not to possess the appropriate experience to run the association, trainings will be conducted.

The trainings include basic accounting and management skills courses for the BWSA staff and technical skills training courses for the members/caretakers who will be involved in the operation and maintenance of the system.

To supplement the training program, a direct personnel consultation during the operation period is required to reinforce the theories learned.

All activities mentioned above are to be initiated by the DEO/CEO with the Provincial Trainors Team (PTT), if already formed, taking the main responsibility, particularly the Training Officers (SMDOs and MDOs) or the Institutional Development Officers.

6.9 Projects by Administration and By Contract

Projects can be executed either by Administration or by Contract subject to existing legal requirements.

Considering the magnitude of projects to be undertaken, the accelerated program *vis-a-vis* the timeframe alloted, district offices should combine projects done by administration and contract.

The method of execution will be dictated by several factors in the field, like equipment capacity, availability of drillers and contractors, time schedule, peace and order condition, hydrogeologic condition, and location (i.e., remoteness) of projects. The concerned District/City Engineer will assess the condition and decide on the proportioning.

6.10 Accreditation of Well Drilling and Civil Works Contractors

All proposed well drilling (for well drilling projects) and civil works contractors (for spring development projects) must be properly accredited by the District/City Offices following existing Department guidelines. Special attention should be given to the type and availability of drilling equipment.

In cases where there is a lack of well drilling contractors, the Well Drillers Association of the Philippines (WELDAPHIL), a national organization based in Manila, has offered their services; but their participation in the program is subject to all existing government regulations.

6.11 Special Conditions in Well Drilling Contracts

The Implementing Rules and Regulations of Presidential Decree 1594, as amended, will be strictly followed in the prosecution of contracts. As supplements to regular conditions of the contract, additional provisions should be included in well drilling contracts under the following situations:

A. On Well Depth

As a general rule, the government shall pay for the services rendered.

(i.) The contract specifies a particular well depth. Before reaching such depth, however, water of good quality and sufficient quantity (at least 10 GPM) should be obtained. The District/City Engineer at this instance can stop the drilling work and direct for the well development process. On the other hand, the Contractor can also recommend that drilling be stopped and proceed with well development activity. This recommendation shall be subject to the approval of the District/City Engineer. Payment shall then be made based on the actual depth of the well and shall include mobilization and demobilization costs. Other pay items shall be paid proportionately based on actual depth drilled.

(ii.) If the contracted well depth has been reached but the quantity of water available is less than the minimum of 10 GPM or if water not available at all, the District/City Engineer is obligated to pay for services rendered. The District/City Engineer, however, may direct the contractor to continue drilling and corresponding extra work order be effected. The District/City Engineer, however, should exercise his option in determining if further drilling proves economical. For cases like these, the preparation of the program of work should take into utmost consideration the hydrogeologic characteristic of the area where a well will be drilled. Depth of existing nearby wells or log books of previously constructed wells within the area should be explored.

B. Water Quality

Water quality is important for a well. In instances where contracted well depth has been reached but water obtained is of poor quality, the District/City Engineer is still obligated to pay for services rendered. On his sound judgement, however, the District/City Engineer can order the contractor to proceed further drilling and corresponding extra work order be effected, provided that the District/City Engineer exercises his option in determining if further drilling proves economical.

6.12 Drilling Machines Propriety and Availability

All DPWH-owned drilling machines shall be made available for use to realize the program. Drilling rigs, including other support equipment and vehicles must be prepared and conditioned and shall be operated at optimum levels. Table 2 depicts the suitability of use of various types of drilling rigs depending on the type of soil.

6.13 Quality of Construction

(a) Materials Testing

Acceptance/Sampling/Materials Testing shall be conducted upon deliveries to ascertain that the quality of incoming materials conforms with the DPWH Specifications.

The designated Materials Testing Engineer shall be guided by the Memorandum of the Honorable Secretary, Fiorello R. Estuar of January 25, 1989, regarding the revised schedule of Minimum Test Requirements Governing Items of Work of the DPWH Standard Specifications for Highways, Bridges and Airports, 1988 (Volume II). The Memorandum will provide uniform implementation of Materials Quality Control. Other materials not covered in the Memorandum shall follow the International Standards in Acceptance/Sampling/Materials Testing, such as ASTM, ANSI, and ASQC.

(b) Well Development

To ensure the steady yield of water from the well, to increase its production and improve the

TABLE 2
SUITABILITY OF USE OF DRILLING RIGS

TYPE OF STRATA	TYPE OF DRILLING RIG	
	PERCUSSION	ROTARY
Unconsolidated sedimentary material mostly not so sticky materials	0	0
Unconsolidated sedimentary material but dominated by sticky clay	x	0
Young sedimentary rocks like sandstones, silt stone mud stone, etc.	0	0
Porous Coral Limestone	0	x
Alternated young volcanic detritus like lava, ash, agglomerate, scoria	0	0
Comparatively honogeneous and not so compacted tuffaceous rocks	0	0
Hard rocks	x	0
Flood plain or terrace where existence of big boulders are expected	0	0

LEGEND:

0 - Applicable
x - Not applicable

quality of water, each well to be constructed under the program should first be developed.

Development of a well is a process of removing fine sand, silt, clay and other undesirable materials and opening the water bearing formation thereby permitting the water to enter the well more freely. Likewise, well development results in the production of a natural filter consisting of coarser and more uniform sand and gravel around the screen.

There are several methods of well development such as: surging by the use of plunger, surging by high velocity jetting, air surging and others. Reflected in Appendix 2 are the brief description of the different methodologies of well development.

(c) Well Platform

Precaution must be observed to protect the well from all possible sources of contamination. After construction of the well, it must be provided with a platform. A brief description of a well platform is shown below:

i. The well apron should be at least 30 cm. above the ground surface or 60 cm. above the flooding level if it is constructed within the vicinity of a river.

ii. The apron should be watertight, preferably made of concrete. It should be at least 10 cm. thick and should extend at least one meter around the well casing.

iii. The surface should slope at least 1% from the center towards the drainage built along its edges.

iv. Build a ditch or a drainage canal to collect dripping water in order to prevent muddy ground in the vicinity of the well or re-infiltration of water in the well.

(d) Spring Discharge

Spring water occurs when water in a water bearing stratum reaches the surface of the ground. Small water holes or wet spots at the foot of hills or the presence of green vegetation in dry areas usually indicate the existence of springs. To warrant a spring development, the discharge or yield should be within 40-150 liters per minute, for Level I projects.

(e) Spring Development

The development of springs must be considered after the important requirements such as, quantity, quality, elevation, and distance from the end-users have been satisfied. The appropriate type of spring intake to be constructed depends on the actual conditions in the field.

(f) Water Quality Standards

After well development, disinfection shall be conducted. Once the system has been disinfected, water quality analyses, such as, physical, chemical and bacteriological, must be undertaken. The designated Water Quality Analysts of the DEOs/CEOs should be guided by the Joint Ministry Order No. 1, series of 1985, regarding the Nationwide Water Quality Control and Surveillance Implementation Guidelines, to maintain uniform implementation of water quality control program, copy appended as Appendix 3.

6.14 Training Program

The strategy being adopted by the PMO-RWS in its training program is based on the "cascading" principle. This means that trainors at the national level trains the next lower level, which in turn trains the succeeding lower level.

This principle has brought about the formation of Regional Master Trainors Team (RMTT) and some Provincial Trainors Team (PTT), although some regions are yet to conduct their Provincial Trainors Team Training Course. Both the RMTT and the PTT teams are composed of members of different disciplines to answer the various needs in the human resource development in rural water supply project implementation, namely, the financial aspect, the institutional aspect, and the technical aspect. Other trainings are also being conducted at these two levels to supplement the basic knowledge gained in previous trainings participated.

To ensure the competence of the would-be users of the water supply facilities, a series of training activities will be conducted at the barangay level synchronized with the different stages of project implementation. These training activities are as follows:

(a) Orientation Conference

(b) Information Dissemination Meetings

(c) Membership Organizational Meeting

(d) BWSA Basic Skills Training

Details of the above-mentioned activities are attached as Appendix 4.

The conduct of all the activities mentioned will be the responsibility of the District/City Engineering Office thru the PTT with the coordination of the RMTT and the PMO-RWS Training Staff.

6.15 Project Turnover

A project will be officially turned-over to the barangay after the training of caretakers on proper operation and maintenance, is undertaken upon the completion of the project. In no case will a project be accepted by the barangay without satisfactorily complying with all aforementioned requirements.

Shown in Appendix 5 is the Turnover Form which should be accomplished and duly signed.

On the other hand, the usual requirements prior to project completion like pumping test, water quality test and well disinfection, (for wells), and safe yield/discharge, water quality and hydro-leak test, (for springs), must be complied.

6.16 Operation and Maintenance (O & M) Manual

The DPWH recently formulated several O & M Manuals to serve as a handy reference for the BWSA. These manuals cover the operation and maintenance of shallow/intermediate wells, deep wells and developed springs.

These manuals should be distributed and disseminated to the BWSA officers and members.

Sufficient copies of these manuals should be made available for distribution.

6.17 List of Manufacturers

Enumerated in Appendix 6 are several manufacturers of various types of materials in the Philippines. Their production capacities vary.

As a guide to Regional/District/City Offices in the procurement of materials, a price list of the materials by size (as of a certain date) is indicated in Appendix 7. However, additional allowable costs should be considered, like inventory and transportation costs and distributor's overhead.

6.18 Equipment Rental

Drilling rigs can be leased or rented out to contractors subject to existing Bureau of Equipment (BOE) regulations (e.g. government projects, applicable only for rental rates) and in accordance with existing DPWH guidelines.

VII. REPORTING REQUIREMENTS

7.1 S-curves and Monitoring and Evaluation Tables

a. Construction Stage

The traditional Project Facilitation Committee (PFC) S-curves and Tables must be accomplished monthly.

b. Operational Stage

The herein appended RWS Monitoring and Evaluation Tables (Refer to Appendix 8) should be periodically accomplished.

7.2 Report Submission and Frequency of Reporting

The PFC S-curves and Tables, together with the Monitoring and Evaluation Tables, should be accomplished by the District/City Offices and subsequently endorsed to the Regional Director (Attn.: Monitoring Division) not later than the 7th day of each month.

The Regional Directors will then submit the received consolidated monthly reports to the Project Manager, Project Management Office for Rural Water Supply, DPWH, 2nd Street, Port Area, Manila, not later than the 15th of each month, copy furnished, Bureau of Construction.

For purposes of control and easy reference, the report subject should be labelled as "Accelerated Water Supply Program".

The PMO-RWS shall prepare a status report addressed to the following at the indicated frequencies:

TYPE OF REPORT	ADDRESSEE	FREQUENCY
Executive Brief	Secretary	Monthly
Comprehensive Status Report	Director (BOC), Asst. Secretary for Management Information	Monthly
Quarterly Progress Report	Secretary/Asst. Sec. for Monitoring, Speaker of	Quarterly

	the House (Attn.: Committee on Public Works), Senate President (Attn: Committee on Public Works)	
Annual Report	-do-	Annual

VIII. FINANCIAL ASPECT

8.1 Fund Process Diagram

The diagram shown in Figure 5 illustrates the Flow of Funds commencing from the issuance of funds by the Department of Budget and Management until its disbursement by the concerned contractor.

Moreover, the financial reporting procedure is also presented.

8.2 Sources of Funds

The required amount for the implementation of the construction, rehabilitation and repair program shall emanate from the General Appropriations Acts and Public Works Acts of 1989, 1990 and 1991.

8.3 Accounting and Auditing

Disbursements of funds under the program shall all be subject to the usual accounting and auditing procedures.

8.4 Monthly Water Fee

For Level I system, the determination of the monthly water fee includes only the operation and maintenance cost (OMC) and the allowance for depreciation of handpump, as in the case of wells, and materials, as in the case of springs. Shown below are sample computations of water charges per household for each type of water system.

Formulas

Water Fee	=	Operation and Maintenace Cost + Depreciation Cost
OMC	=	Wage (caretaker) + Maintenance Cost*

Depreciation Cost	=	Total Value / Estimated economic life
Total Value (for partial cost-recovery)	=	cost of handpump set (well)/ partial materials (spring development)

* Maintenance cost - approximately 15% of Total Value

Data

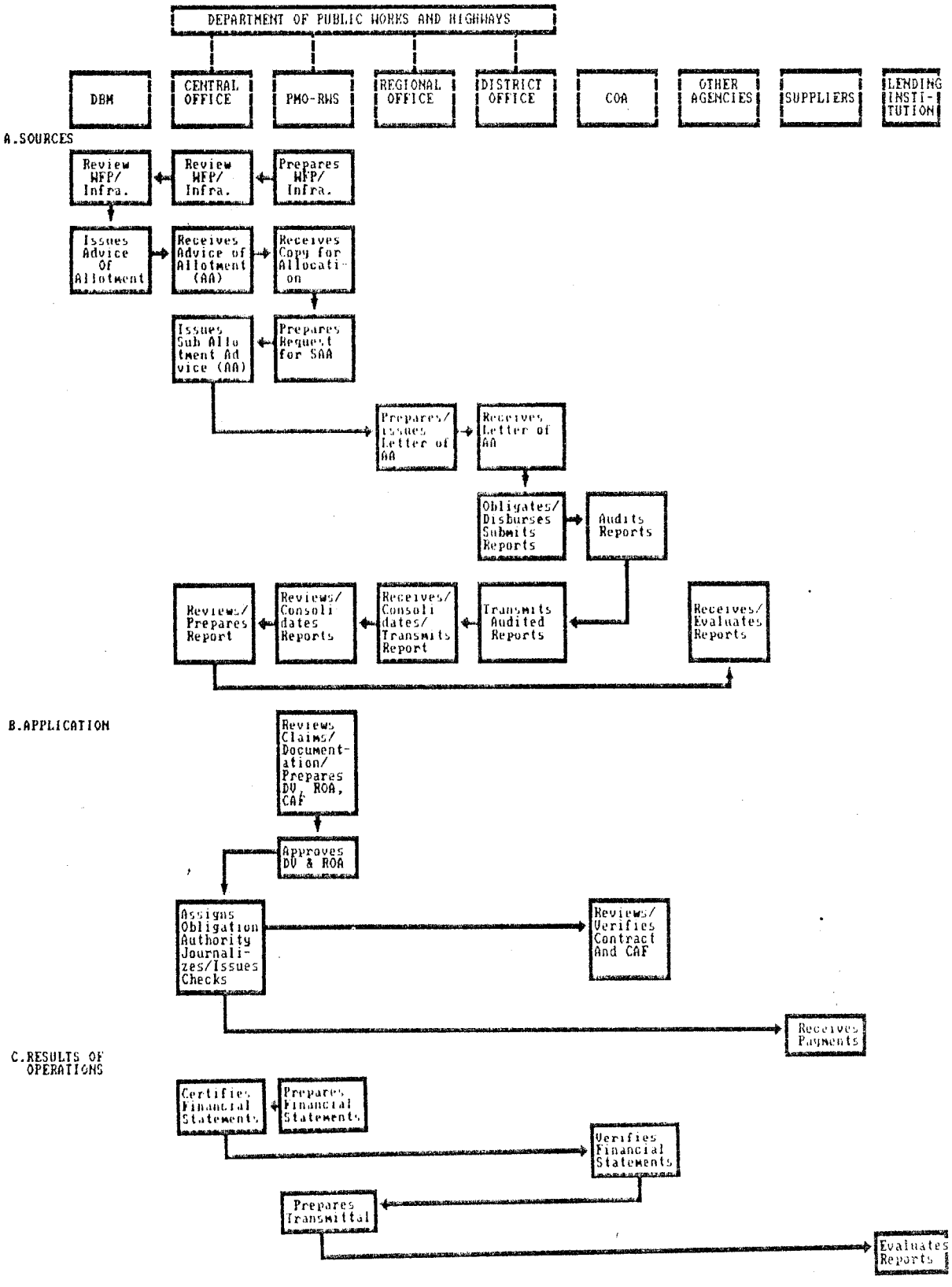
Type of Facility	Average No. of House-holds served	Estimated Economic Life (years)	Total Value (₱)
Deep Well	25	10	7,000
Shallow Well	25	5	700
Spring Development	30	10	17,735

Sample Computation of Water Fee

Particulars	Water Fee per Month per Facility: Deep Well (₱)	Shallow Well (₱)	Spring Development (₱)
1. Operation and Maintenance Cost			
a) Wage (Caretaker)	150.00	150.00	150.00
b) Maintenance (Maintenance Cost/ Estimated life/12)	8.75	1.75	22.17
Sub Total	158.75	151.75	172.17
2. Depreciation Cost	58.33	11.67	147.80
Total Cost	217.08	163.42	319.97
3. Water Fee per Household	8.68	6.54	10.66
	Say, 9.00	Say, 7.00	Say, 11.00

Figure 5

FLOW OF FUNDS



APPENDIX 1
MANIFESTO RESOLUTION

We the undersigned household heads of Barangay _____ Municipality of _____ Province of _____ aware of the pressing need to improve our present water supply system, make manifest our desire to avail of the Rural Water Supply Program and in this regard, we therefore seek the assistance of the Municipal Government.

Conscious of the attendant obligation and responsibilities of those who avail of the above mentioned program we have constituted ourselves into an association and we hereby certify.

1. That the name of the Association shall be _____ _____ Barangay Waterworks and Sanitation Association.

2. That the Association is formed primarily to provide the members with adequate supply of potable water for domestic use.

3. That the Association shall have its office at _____ _____, Province of _____.

4. That the term for which said Association is to exist is fifty (50) years, from and after the date of incorporation.

5. That the following have been elected to positions as indicated opposite their names:

_____	President
_____	Vice President
_____	Secretary
_____	Treasurer

6. That the incorporators of the Association are the first fifteen (15) persons whose names, signatures and residence certificate numbers appears on page 3.

To ensure the success of the program and the smooth operation and proper maintenance of the proposed water supply system, we hereby bind ourselves to the following:

1. That we will secure a suitable site for the project which should not be less than two meters wide by two meters long either by purchase or donation.

2. That we will assign a caretaker for the waterworks system.

3. That we will pay a monthly contribution ₱_____ to the Treasurer of the Association which will be used in the repair and maintenance of the system.

4. That as members of the Association, it is our duty and obligations to:

   a. Pay our fees and dues as they fall due;

   b. Attend all meetings and seminars that may be prescribed by the Board of Directors;

   c. Adopt effective ways in the proper utilization of water and preventive maintenance of facilities as prescribed by the Association;

   d. Assist in the installation of the water system;

   e. Help attain the aims and purposes of the Association.

5. That we exercise the following rights:

   a. Right to vote;

   b. Right to hold elective office;

   c. Right to be informed of the Association affairs;

   d. Right to examine the Association books of account;

   e. Right to bring charges against any board member;

   f. Right to avail of the Association's water system and facilities.

6. That the business and affairs of the Association shall be carried on and its powers exercised by and through the Board of Directors except those which are by law conferred to the members of this Association.

7. That the members shall hold annual meeting at such time and place within the service area of the Association for the purpose of electing its directors and discuss other matters.

8. That during the first annual meeting, five (5) regular board members shall be elected to office, two of whom shall serve for a term of one year, two for two years and one for three year regular terms of office after the initial term shall be for three years.

9. That the Officers shall be elected by ballot by and from the Board at the meeting of the Board held immediately after the annual meeting of members.

10. That our private property shall be exempted from execution or other liability for the debts of the Association and we will not be liable or responsible for any debt or liability of the Association.

11. That we will comply with the rules and regulation approved by the members of the Association.

NOW, THEREFORE, we hereunto set our hands this _____ day of _____, 19_____.

	PRINTED NAME	SIGNATURE	TAN OR RCN
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. _____ _____ _____

FOR BARANGAY COUNCIL USE

This is to recommend favorable consideration of this resolution with the assurance of our support for the early completion of the water system.

_____ _____

Date Barangay Captain

FOR MUNICIPAL COUNCIL USE

Approved for assistance:

_____ _____

Date Chairman

Approved with Registry No. _____

APPENDIX 2
METHODOLOGY OF WELL DEVELOPMENT

1. Surging by use of Plunger

1.1 Introduce a solid plunger which fits the wall of the casing into the blank casing and lower it beneath the water level or near the screen or perforated pipe.

1.2 Attach the other end of the plunger to a tripod as shown in Figure 4 and measure the bottom depth.

1.3 Move the plunger up and down violently. This will cause water to rush out into the aquifer thereby disturbing the water bearing formation and suspending the fine materials.

1.4 Remove the plunger and install the pumping facilities.

1.5 Remove the suspended materials by pumping.

1.6 Repeat the above process until the well yields water which is free of fine materials. Normally, 5-10 repetitions would be enough to obtain the desired results.

Surge plungers sometimes produce unsatisfactorily results where the aquifer contains clay streaks or clay balls. The action of the plunger can cause the clay to plaster over the screen surface thereby reducing the yield rather than increasing it. Also, enough weight should be attached to the plunger to make it drop readily on the downstroke.

2. Surging by High Velocity Jetting

Generally, this is the most effective method of developing a well. It is simple to use and is not likely to cause problems from over application of water.

Simple jetting tools together with a high pressure pump and necessary hose and piping (Figure 5) are the principal tools and equipment needed. The forceful action of high velocity jet working out through the screen openings agitates and rearranges the sand and gravel particles of the water bearing formation surrounding the screen. The jetting action breaks up wall cake, disperses drilling mud, and corrects the damages of the formation which resulted from excavation or drilling.

The well development procedure consists of training a horizontal water jet inside the wall in such a way that the high-velocity streams of water shoot out through the screen openings. By slowly rotating the jetting tools and gradually raising and lowering it, the entire surface of the screen receives the vigorous action of the jet. A swivel connection between the hose and pipe makes the operation easier. Also, a pipe clamp should be provided to aid in rotating the jetting tools.

3. Air Surging

Compressed air may be used effectively in well development set up. The compressor to be employed for this purpose should be capable of developing a maximum pressure of at least 40 meters (100 psi), and 60 percent of the total length of air line should be submerged in water while pumping to achieve best results.

Air surging is accomplished by injecting high pressure air from the compressor into the well. This reverses the flow through the screen openings and towards the water bearing stratum causing its disturbance and the suspension of fine sand and other materials. These suspended particles are removed by pumping.

APPENDIX 3

MINISTRY OF HEALTH
Manila

MINISTRY OF PUBLIC WORK
AND HIGHWAYS
Manila

January 24, 1985

'JOINT MINISTRY ORDER)
NO. 1)
Series 1985)

SUBJECT: Nationwide Water Quality Control and Surveillance Implementation Guidelines

= =

Pursuant to Memorandum of Agreement between the Ministry of Health and the Ministry of Public Works and Highways, dated 07 February 1984, regarding the water quality control program to cover nationwide monitoring and surveillance of water quality for all levels of existing and newly construction water systems, a NATIONWIDE WATER QUALITY CONTROL AND SURVEILLANCE IMPLEMENTATION GUIDELINES is hereby promulgated.

The Guidelines will provide uniform implementation of projects on proper development, maintenance, and sanitary control of water supply systems, and to intensify the water quality control program. Likewise, it shall serve as standard procedures in conducting water quality analyses.

For dissemination to, and compliance of, all concerned.

JESUS C. AZURIN
Minister
Ministry of Health

JESUS S. HIPOLITO
Minister
Ministry of Public Works and Highways

APPENDIX 4
TRAINING ACTIVITIES

I. Pre-Formation Activities

A. Orientation Conference

Rationale:

The Orientation Conference is of utmost significance since this activity will pave the way to the initial contact with the beneficiary barangays.

This one-day conference seeks to promote the program and generate commitment of the municipal leaders in the pursuance of this development endeavor.

Objectives

1. To provide the local government officials with the information regarding the Accelerated Rural Water Supply Program.

2. To solicit the commitment and involvement of local government officials in the massive information dissemination of program to their respective constituent barangays.

3. To provide the local government officials with the information regarding their role in the implementation of the program.

Trainors and Participants

Through the PTT, this conference will be conducted by the District Engineering Offices and will be attended by all the municipal mayors under their area of jurisdiction.

Output

At the end of the conference, the participants must set their respective schedules for the next activity.

B. Information Dissemination Meeting

Rationale

With the municipal mayors, already informed of the different highlights of the program, contact with the recipient barangays must now be initiated.

This meeting expects to generate positive attitude and acceptance of the barangay for the projet as may be manifested by the commitment that will be solicited from the participating barangay leaders.

Objectives:

1. To provide barangay officials with the information regarding the Accelerated Rural Water Supply Program.

2. To solicit the commitment and involvement of barangay officials in project implementation, particularly in the formation of BWSA.

3. To provide the forum with knowledge on BWSA concept.

4. To inform the participants of the importance, procedure and requirement in the registration of BWSA.

5. To solicit the support and commitment of the barangays leaders in the dissemination of information among their respective constituents.

Trainors and Participants:

This one-day meeting will be conducted at the municipal level as programmed during the orientation conference with municipal mayors, with District Engineering Offices thru the PTT, having the responsibility of coordination, supervision and monitoring. This is to be conducted for each municipality and will be attended by barangay officials.

Output:

At the end of the meeting, participants must set their schedules for the Membership Organizational Meeting in their respective barangays.

II. FORMATION ACTIVITY

A. Membership Organizational Meeting

Before project will be actually implemented, prospective consumer-members must be made fully aware of what they could expect out of the project and what are expected of them for the project. They must be informed of the details of the physical features of the project as well as their corresponding responsibilities to ensure a smooth operation once project is completed.

This meeting aspires to organize, mobilize, train and harness the local human resources of the barangay.

Objectives:

1. To ingrain in the mind of the targetted beneficiaries the responsibility complementing the opportunity of owning a waterworks project.

2. To provide the forum with in-depth knowledge on RWSA.

3. To inform the recipient barangay of the physical features of the water supply facility.

4. To inform the barangay of the health benefit that can be derived from the project.

5. To inform the barangay of the importance, procedure and requirement in the registration of the BWSA.

6. To organize the BWSA and establish its leadership.

7. To elect the Board of Directors from which the set of officers will be elected.

8. To elect members of the committee on audit and members of the committee on election.

9. To identify the caretaker of the facility.

Trainors and Participants

This one-day activity will be attended by the general membership of recipient barangay. The PTT will conduct this meeting in coordination with the respective municipal council.

Methodology

The first half of the day will be devoted mainly for information dissemination in response to objectives 1 to 5.

After information has been fully disseminated, the BWSA must be organized. From the general membership, a set of Board of Directors with five (5) members shall

be elected from which the following officers will conform.

1. President
2. Vice President
3. Secretary
4. Treasurer
5. Members

The body shall also elect members of the committees.

After the election, the manifesto resolution shall be discussed by the PTT after which the same document shall be accomplished.

III. POST FORMATION ACTIVITY

A. BWSA Basic Skills Training

Rationale:

The BWSA takes the responsibility of operating and maintaining the water supply facility after its completion. The facility must be properly operated and maintained to provide efficient service and supply potable water during its lifetime. Likewise, success and continued operation of a BWSA highly depends on effective management, proper upkeep of financial records and adoption of suitable accounting procedures.

It will therefore be necessary that before water supply facility is turned over the barangay, would be management staff should be trained with these skills.

Objectives:

1. To develop the competence of the caretaker in the proper use, maintenance and repair of the facility.
2. To develop the competence of the BWSA Officers in the proper management and financial upkeep of the facility.

Trainors and Participants:

The one-day activity shall be conducted at the municipal level with officers of organized BWSA's as participants. Conduct of this training shall be undertaken by the DEO thru the PTT in coordination with Municipal Council.

Methodology:

The principal methods of instruction to this kind of training shall be lectures, demonstrations and practice exercises.

APPENDIX 6
TURN-OVER FORM

DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
OFFICE OF THE DISTRICT ENGINEER
_____ ENGINEERING DISTRICT

CERTIFICATE OF PROJECT COMPLETION

This is to certify that the Water Supply System (Level I) constructed for the _____ Barangay Waterworks and Sanitation Association (BWSA), in _____ (Barangay) _____ (Town, Province) has been completed as of _____ (Date of Completion) with a total project cost of _____ (₱_____).

This further certifies that the/these structure(s) and facility(ies) were constructed in accordance with the plans and specifications prepared and submitted by our office.

Prepared by:

_____ Name

_____ Date

_____ Position

Certified Correct:

_____ DISTRICT ENGINEER

_____ Date

_____ BWSA

_____

(Barangay, Municipality)

_____

(PROVINCE)

CERTIFICATE OF ACCEPTANCE

EXCERPTS FROM THE MINUTES OF THE MEETING OF THE BOARD OF DIRECTORS OF _____ BWSA, HELD AT _____ _____ ON _____

Resolution No. _____

WHEREAS, the Department of Public Works and Highways (DPWH) Engineering District of _____ has constructed and completed our present waterworks system last _____.

WHEREAS, the said waterworks system has been inspected by the Board of Directors (BOD) and found to be acceptable and is at present already serving the residents/population of our barangay;

NOW, THEREFORE, on motion duly moved and seconded:

RESOLVED, as it hereby resolved, to accept the turn-over of waterworks project by the DPWH to the _____ _____ BWSA;

RESOLVED FINALLY to provide copies of this resolution to DPWH.

APPROVED:

_____

President

_____ _____

Vice-President Secretary

_____ _____

Treasurer Member

APPENDIX 6
LIST OF LOCAL MANUFACTURERS

N A M E	ADDRESS
A. PVC PIPES	
1. ATLANTA IND., INC.	97 9TH Ave., Grace Park Caloocan City, M.M.
2. ITALIT CONST. & DEV. CORP.	48 Broadway, Quezon City Tel. No. 721-73-14 721-48-27
4. MOLDEX PRODUCTS, INC.	No. 3 West-6th cor. Times St., Quezon City Tel. No. 95-10-41 to 47 99-71-82 99-57-33
5. NELTEX DEV. CORPORATION	146 National Highway Pamplona, Las Pinas Tel. No. 828-16-26 828-11-75
B. STEEL /G.I. PIPES	
1. GOODYEAR STEEL PIPE CORP.	128 Quirino Highway, Q.C. Tel. No. 35-45-21 35-45-22
2. INTERNATIONAL PIPE INDUSTRY	Philcomsen Building Pasig, Metro Manila
3. MAYER STEEL PIPE CORP.	Santiago St., Bo. Canumay Valenzuela, Metro Manila
4. RIGID METAL MFG. CORP.	Maisan Rd. Valenzuela Metro Manila Tel. No. 35-85-52 35-86-57

C. HANDPUMPS

1. ATLANTA IND., INC.	97 9th Ave., Grace Park Caloocan City
2. HATTATSU PHILIPPINE INDUSTRIAL CORPORATION	Gen. Luis St., Barrio Caloocan City, Metro Manila Tel. 90-40-49 90-25-32
3. MALANDAY MACHINERY AND MFG. CORPORATION	Sumilang Subd., Dalandanan Valenzuela, Metro Manila
4. METALS ENGINEERING RESOURCES CORPORATION	E. Magalona Street Mandaluyong, Metro Manila Tel. No. 70-44-31
5. PHILIPPINE UNITED FOUNDRY AND MACHINERY CORPORATION	75 Balon Bato Balintawak, Quezon City Tel. No. 361-82-77
6. SARMONT METAL FABRICATION	V-Mart Commercial Center Dr. A. Santos Avenue, Paranaque, Metro Manila Tel. No. 827-71-40
7. SEACOM CO., INC.	3085 R. Magsaysay Blvd. cor. V. Cruz, Sta. Mesa Metro Manila Tel. No. 61-15-21 to 26 60-29-28

D. WATER WELL STEEL SCREEN

1. ATLANTA INDUSTRIES, INC.	97 9th Ave., Grace Park Caloocan City
2. JOHNSON SCREEN PTY. LTD	Room 401-A 4th Floor, ITC Building 337 Gil Puyat Ave. Ext. Makati, Metro Manila
3. MALANDAY MACHINERY AND MFG. CORP.	Sumilang Subd., Dalandanan Valenzuela, Metro Manila
4. THE TRIMAX CORPORATION	M01-M02 Catalina Building E. Rodriguez Ave. cor. New York Street, Cubao, Q.C. Tel. No. 99-22-50

APPENDIX 7
PRICE LIST OF WATER SUPPLY MATERIALS

MATERIALS	UNIT COST (₱)
Shallow Well Handpump Set	550
Modified Deep Well Handpump Set	3,160
Light Duty Deep Well Handpump Set	2,340
100mm0 3M. Steel Casing Pipe	660
100mm0 x 3M. Low Carbon Steel Screen	1,730
50mm0 x 910mm. Drive Well Point	400
100mm0 x 6M. PVC Pipe	990
100mm0 x 3M. PVC Screen	1,540
Bentonite Clay	370
GATE VALVES AND FAUCET	
a. 63mm0	340
b. 50mm0	160
c. 38mm0	120
d. 25mm0	70
e. Brass Faucet 13mm0	20
G.I. PIPES AND FITTINGS	
a. 63mm0 x 6M. G.I. Pipe with Coupling	620
b. 50mm0 x 6M. G.I. Pipe with Coupling	360
c. 38mm0 x 6M. G.I. Pipe with Coupling	280
d. 25mm0 x 6M. G.I. Pipe with Coupling	170
e. 13mm0 x 6M. G.I. Pipe with Coupling	85
f. 50mm0 x 3M. G.I. Pipe with Coupling	180
g. 50mm0, Union Patente	60
h. 38mm0, Union Patente	40
i. 25mm0, Union Patente	25
j. 63mm0, Coupling Reducer	30
k. 50mm0, Coupling Reducer	20
l. 38mm0, Coupling Reducer	15
m. 25mm0, Coupling Reducer	10
n. 50mm0, Tee Reducer	30
o. 38mm0, Tee Standard	20
p. 25mm0, Tee Standard	10
q. 50mm0, Elbow (90)	25

G.I. PIPES AND FITTINGS

r. 13mm0, Elbow (90)	5
s. 50mm0, Elbow (45)	25
t. 38mm0, Elbow (45)	15
u. 25mm0, Elbow (45)	10
v. 38mm0, 150mm, Nipple	10
w. 50mm0 x 150mm, Nipple	15
x. 13mm0 x 1.0M Stand Pipe	20
y. Teflon Tape	20

NOTE: Prices obtained through ICB last August 1988

APPENDIX 8

FORM O-G

BWSA OPERATION STATUS: GENERAL INFORMATION
As of _____

_____ BWSA MUNICIPALITY: _____
PROVINCE : _____

A. TOTAL NUMBER OF EXISTING HOUSEHOLDS: _____
B. NUMBER OF EXISTING LEVEL I SYSTEM :

TYPE	NUMBER	HHS
a. Shallow Well		
b. Deep Well		
c. Spring Development		
d. Free Flowing Well		
f. Rain Collector		
TOTAL		

C. DATE BWSA REGISTERED : _____
D. TOTAL NUMBER OF BWSA MEMBERS : _____
E. TOTAL AMOUNT OF COLLECTION : _____
F. TYPE & NUMBER OF MEMBERS TRAINED :

TYPE	NO. OF TRAINED	DATE OF TRAINING

PREPARED & SUBMITTED BY:

_____
Name

_____
Position

FORM O-S

BWSA OPERATION STATUS: SPRING
As of _____

_____ BWSA MUNICIPALITY: _____
PROVINCE : _____

TYPE OF FACILITY: _____
SPRING PROJECT NUMBER: _____
DATE CONSTRUCTION COMPLETED: _____
NUMBER OF HOUSEHOLD SERVE (HHS): _____

I. TECHNICAL DESCRIPTION

a. Size of Spring Box: Length : _____m.
Width : _____m.
Depth : _____m.
Diameter (if circular) : _____m.

b. Discharge : _____lps.
c. Total Length of Pipe : _____m.
d. Type of Pipe : _____
e. Type, Number and Size/s Pipes Used : _____
f. Water Quality : _____
g. Status (Pls. check)

Operational

Non-operational

II. FINANCIAL

a. Monthly collection per month per household (₱): _____
b. Total Collection to date (₱) : _____

III. REPAIR AND MAINTENANCE NEEDS

a. DESCRIPTION: _____

b. Estimated Cost: ₱ _____
c. Government Assistance needed, if any:

PREPARED & SUBMITTED BY:

_____
Name

_____
Position

FORM I-W

BWSA OPERATION STATUS: WELLS
As of _____

_____ BWSA MUNICIPALITY: _____
PROVINCE : _____

TYPE OF FACILITY: _____
WELL NUMBER : _____
DATE CONSTRUCTION COMPLETED : _____
NUMBER OF HOUSEHOLD SERVE (HHS) : _____

I. TECHNICAL DESCRIPTION

a. Depth of Well : _____ m.
b. Diameter of Casing : _____ m.
c. Depth of Water Table : _____ m.
d. Discharge : _____ lps.
e. Water Quality : _____
f. Type of Handpump : _____
g. Status (Pls. Check)

Operational

Non-operational

II. FINANCIAL

a. Monthly collection per month per household (₱) : _____
b. Total Collection to Date ₱) : _____

III. REPAIR/MAINTENANCE NEEDS:

a. DESCRIPTION: _____

b. ESTIMATED COST (₱): _____
c. GOV'T. ASSISTANCE NEEDED, IF ANY:

PREPARED & SUBMITTED BY:

_____
Name

_____
Position