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PAN AMERICAN HEALTH ORGANIZATION  
*Pan American Sanitary Bureau, Regional Office of the*  
WORLD HEALTH ORGANIZATION

TRAINING SYSTEM FOR TECHNICAL PERSONNEL  
OF WATER SUPPLY AND SANITATION INSTITUTIONS  
IN CENTRAL AMERICA, PANAMA,  
AND THE DOMINICAN REPUBLIC



- MID TERM EVALUATION -

AUGUST 1986



Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH



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Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH



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WATER SUPPLY AND SANITATION INSTITUTIONS IN  
CENTRAL AMERICA, PANAMA, AND THE  
DOMINICAN REPUBLIC

- MID TERM EVALUATION -  
AUGUST 1986

REPORT PREPARED BY:  
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COOPERATIVE PROGRAM WHO/PAHO/GTZ

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ANNEXES

## 1. INTRODUCTION

The project has its origin in the I Meeting of Managers and Directors of Water Supply and Sewerage Agencies of Central America and Panama, which convened in San José, Costa Rica on 10-11 May 1979.

The global objective of the project, as it was defined at the meeting in Costa Rica, is to establish a permanent, self-sustaining training system, with a view to improving water supply and sanitation services in Central America and Panama. The discussions led to the adoption of various resolutions, among which Resolution V is considered to be of utmost importance, since it deals with manpower training and development in the water supply and sanitation sector. In pursuance of this Resolution, the meeting in Costa Rica further agreed to entrust the delegation of Nicaragua to design a training plan for non-professional, technical personnel involved in operation and maintenance activities, to request PAHO/WHO to cooperate in the formulation of such a plan, and to seek financial support from among the international and bilateral donor agencies for the execution of the project.

Subsequently, the II Meeting of Managers and Directors of Water Supply and Sewerage of Central America and Panama which was held in Tegucigalpa, Honduras from 27 to 29 October 1980, adopted the training plan prepared by the delegation of Nicaragua. It reviewed also the Draft Project Proposal prepared by PAHO which was to serve as a basis for negotiations with potential donor agencies for financial support.

The latter and other issues were further discussed at the Extraordinary Meeting of Managers and Directors of Water Supply and Sewerage Institutions of Central America and Panama which convened in Panama City on 4-5 May 1981. The important decisions taken at this meeting include: the establishment in San José, Costa Rica of the Executive Secretariat of the Committee of Managers and Directors of the Water Supply and Sanitation Institutions, under the acronym of CAPRE, for the years 1981-1983.

The Managers and Directors of the Water Supply and Sewerage Institutions, at subsequent meetings held throughout 1981, gave their formal agreement to the Project Proposal submitted by AyA to GTZ and IDB; authorized AyA, through the Permanent Secretary of CAPRE, to conduct negotiations with potential donors in order to secure financial and technical support; agreed to the inclusion of the Dominican Republic in the project; and requested AyA to negotiate an agreement with PAHO for the implementation of the Project.

As early as February 1981, GTZ and IDB expressed interest in cooperating in the execution of the Project. GTZ interest was further expressed in their request for a feasibility study. This activity was

carried out in collaboration with PAHO, and served as a basis for the reformulation of the Project Proposal which was discussed with IDB. The total cost of the program was estimated at US\$2.426,50 with IDB's contribution of US\$841.000; counterpart funds of US\$1.100.500 and the remainder by GTZ. Although the negotiations with IDB were lengthy, they contributed to the elaboration of the Project's Plan of Operations which was agreed upon by all parties concerned, including both IDB's Committee of Middle Management (February 11, 1982) and IDB's Committee of Technical Cooperation and Loans (March 4, 1982). The latter Committee recommended further that the General Committee (Board of IDB) authorize the proposed grant for the Project. Yet, when Project's operations began in January 1985 it was through technical cooperation and financial support of GTZ, with PAHO as the Executing Agency, and in collaboration with the following Water Supply and Sewerage Institutions of Central America, Panama and Dominican Republic:

- Instituto Costarricense de Acueductos y Alcantarillado, AyA (Costa Rica)
- Administración Nacional de Acueductos y Alcantarillados, ANDA (El Salvador)
- Instituto de Fomento Municipal, INFOM (Guatemala)
- Servicio Autónomo Nacional de Acueductos y Alcantarillados, SANAA (Honduras)
- Instituto Nicaragüense de Acueductos y Alcantarillados, INAA (Nicaragua)
- Instituto de Acueductos y Alcantarillados Nacionales, IDAAN (Panama)
- Instituto Nacional de Agua Potable y Alcantarillado, INAPA (República Dominicana)

The financial support to the Project in accordance with the agreement GTZ/PAHO of November 21, 1983 amounts to US\$485,000.

## 2. METHODOLOGY

The objective of the mission of the Consultants (one each of GTZ and PAHO) was to carry out a mid-term evaluation of the project (1.5 years after its initiation) in accordance with the stipulations of the agreement signed by the parties concerned, and to discuss future recommendations. To this end, the activities performed by the Consultants consisted in the following:

- Reading of project's relevant and intensive documentation;
- discussions -through working sessions- with the Project Manager in San José, Costa Rica, and the officials who, at country and regional levels, are responsible for project's execution and development;

- critical review of educational and self-instructional materials prepared for the training of trainers, coordinators of Training Units established in each of the participating agencies, and supervisors.

Annex 1 provides the list of the national authorities with whom the consultants held discussions.

### 3. FINDINGS

#### 3.1 PAHO/Project Management

In January 1985 PAHO has contracted a highly qualified Project Manager whose management capabilities, dedication and enthusiasm, combined with professional experience in a similar Training System in Brazil contributed to a large extent to the successful implementation of the project. The Project Office was established in February 1985 by the Project Manager and AyA in La Uruca, San José where a national training center of AyA was already in existence.

Project activities then began with the up-dating of the Plan of Operations in March 1985. However, the document which ensued (Plan de Trabajo 1985-1986) proved to be less specific than the original Plan of Operations, in respect of the counterpart contributions of the participating countries, as well as the activities which were planned for execution during 1986. This was due to the fact that IDB's financial support to the project had not yet materialized, and, therefore, the participating agencies refrained from committing the total of their counterpart contribution.

As early as April 1985, the Project management was successful in establishing the Project infrastructure in each of the participating agencies. This consisted in the designation of the National Training Coordinator, and in the setting of Training Units and Working Groups in charge of operation and maintenance.

Project's Manager's overall performance from the initial stage to-date has been thorough, helpful and appreciated, as it contributed to the establishment of good rapport between the Management and the national officials concerned. However, IDB's delay in supporting the project financially placed a heavy burden on the shoulders of the Manager who has been performing both the administrative and technical functions, which originally were to be assumed by two people. This is accountable for the shortcomings experienced in the project's reporting system, which is by far outweighed by the favourable achievements of the Project during this period.



### 3.2 Country Activities

#### 3.2.1 Costa Rica

AyA which can be regarded as the most advanced institution in terms of management and training capabilities among the participating countries, was selected by CAPRE and PAHO to act as the host of the Project Management and the Regional Center of the Project. In accordance with its commitment (letter of AyA, dated February 22, 1984) AyA provided technical, secretarial and auxiliary personnel, office space, equipment and vehicles for the Project Management. The counterpart contribution of AyA, together with the generous support which the Project as a whole received from the top management of AyA, contributed meaningfully to making the project operational as early as February 1985.

In addition to AyA's support to a number of regional workshops and seminars held in Costa Rica (see Annex 2), AyA has executed a national training course for the commercial administration of O & M in March 1986. Training activities initiated by the Project have already developed into a comprehensive institutional and human resources development program at AyA, which, in turn, is made up of several projects dined at improving productivity and efficiency of the institution (see Annex 3). Among these the pilot project of AyA in the North pacific region can be regarded as an outstanding example for the whole region, since it contains all the elements of institutional development, and has produced manuals and didactic material which can be used in other institutions participating in the Project, as well as in Latin America and worldwide (e.g. the job-analysis for meter readers).

#### 3.2.2 El Salvador

The national institution ANDA, under the Ministry of Public Works, which is directly participating in the Project is still suffering from the current political and economical situation in the country. The Project, however, was successful in establishing a Training Unit and Working Group for O & M at ANDA headed by young dedicated and enthusiastic engineers as Coordinators, who after the experience gained at the regional training seminars in Costa Rica and the Dominican Republic, were able to carry out training activities through a national seminar in July 1986 in San Salvador. PLANSABAR, the institution in charge of rural water supply and sanitation under the Ministry of Health has also participated in the Project and established their own Training Unit and Working Group for O & M. Both institutions have cooperated in preparing manuals and didactic material (for details see Annex 2), PLANSABAR has also prepared a valuable document for the rehabilitation and improvement of O & M of rural water supply systems which might serve as a basis for requesting assistance from bilateral agencies.

The delivery of training and improvement of O & M, especially with ANDA, is hampered by inadequate funding because of ANDA's difficult financial situation, and the fact that the top management of ANDA is not paying due attention to the need of human resources development. A comprehensive leak detection program which is financed by IDB and presently under execution by a foreign consultant (TAHAL), has no training component, and is not coordinated with the Project. The lack of support and incentives bear the risk that more personnel trained by the project might leave the institution in the near future.

### 3.2.3 Guatemala

In Guatemala, INFOM is the designated agency in charge of project implementation. The National Training Coordinator is a very active and highly motivated young engineer. He has established INFOM's training infrastructure as well as the training infrastructure in the other sector agencies (EMPAGUA, UNEPAR, COPECAS, and DSM/MSPAS). In 1985, INFOM conducted successfully a national workshop, and elaborated a comprehensive plan of training courses to be carried out in 1986 (see Annex 3 for details). With the assistance of consultants, EMPAGUA is well-advanced in preparing an all-encompassing institutional development plan.

However, there is the need to coordinate sector activities, which fall under the responsibility of four different agencies in addition to INFOM which is the designated national coordinating entity of the CTZ/OPS project.

### 3.2.4 Honduras

The current political and economic situation of the country is accountable for the slow progress experienced in the achievement of project's objectives. Both SANAA, the national institution in charge of water supply and sanitation, and the Division of Environmental Sanitation within the Ministry of health, responsible for the installation of rural water supply systems, are faced with major problems of shortage of personnel and transport facilities. Nonetheless, with assistance provided by the World Bank and France, SANAA is engaged in the elaboration of an institutional development program. The training infrastructure and working groups for operation and maintenance, which are essential elements to project development, were established within SANAA.

The contribution of the Division of Environmental Sanitation is, so far, limited to the designation of a Training Coordinator and the participation of Division staff in training activities.

### 3.2.5 Nicaragua

Due to country's current political and economic situation, progress in project implementation is slow. Project Management in Costa Rica was instrumental in providing short-term consultants who worked laboriously in INAA (the sector agency in charge of water supply and sanitation) and with INAA's staff in the establishment of the national training infrastructure in March 1986. INAA developed a plan of activities for 1986, and successfully conducted a course for the training of supervisors. A comprehensive progress report for the evaluation mission carried out in August 1986 is attached as Annex 3.

### 3.2.6 Panama

The training infrastructure and working groups for operation and maintenance are well established in IDAAN (the national institution in charge of water supply and sanitation) under the supervision of a National Coordinator. A course for the training of supervisor is planned to be implemented in September 1986. IDAAN has also produced training manuals and didactic materials of which details are provided in Annexes 2 and 3.

Through external assistance, IDAAN has contracted the services of two consulting firms, namely Price Waterhouse and Societe des Eaux de Marseilles, who are engaged in the elaboration of a plan for improved financial management, and in the formulation of a leak detection program. Concurrently, IDAAN is setting the stage to develop a centralized information system, and to launch an integrated Human Resources Development Program.

### 3.2.7 Dominican Republic

The three sector agencies, namely INAPA, CAASD, and CORAASAN, are actively participating in project implementation. INAPA is the designated institution to coordinate project activities. Accordingly, project's activities began with the installation of the training infrastructure, the designation of the National Coordinator and Coordinators in CAASD, and CORAASAN. This was followed by the organization and implementation of training activities for supervisors in June 1986. A training program made up of 36 training courses which is to be implemented in 1986-87 has been prepared by CAASD. In addition, both institutions have produced training manuals and didactic materials for local use. Project's achievements are detailed in a Progress Report jointly prepared by the two institutions which is attached as Annexes 2 and 3. Project's achievements augur well for the future.

### 3.3 Cost-Benefit Analysis

At the present stage, it is not yet possible to evaluate the cost and benefits of the Project in real terms. A summary of cost accountable for the Project up to August 1, 1986 is shown on the following Table 1.

TABLE 1. COST OF THE PROJECT PER AUGUST 1, 1986

| SOURCE             | CONTRIBUTION UP TO<br>AUGUST 1, 1986<br>US\$ | TOTAL CONTRIBUTION<br>BUDGETED<br>US\$ |
|--------------------|--|--|
| GTZ/PAHO           | 219,329                                      | 485,000                                |
| IDB                | -  | 685,000                                |
| Costa Rica         | 80,000 *                                     | 160,000                                |
| El Salvador        | 20,000 *                                     | 156,666                                |
| Guatemala          | 30,000 *                                     | 156,666                                |
| Honduras           | 20,000 *                                     | 156,666                                |
| Nicaragua          | 35,000                                       | 156,666                                |
| Panama             | 50,000 *                                     | 156,666                                |
| Dominican Republic | 65,000                                       | 156,666                                |
| SUBTOTAL:          | 300,000                                      | 1,100,000                              |
| TOTAL:             | 519,324                                      | 2,270,000                              |

\* Consultants estimate

According to Table 1 the cost of the Project up to August 1, 1986 were only about US\$520,000 whereas as far as some indicators of direct benefits for the institutions in Costa Rica, Panama, and the Dominican Republic could be obtained by the Consultants, the benefits accrued from operational improvements (reduction of losses, saving of energy, etc.) and increased efficiency of personnel are by far exceeding the direct investments.

#### 4. PLANNED ACTIVITIES (UP TO JULY 1987)

##### 4.1 Programs for Training of Trainers and O & M Personnel

Activities of the Project up to July 1987, when GTZ's present financial contribution to the Project will terminate have to concentrate on the dissemination of training in the participating countries. According to the Plan of Operation, 42 courses would have to be executed in the countries to train about 630 persons in the field of improved O & M, which is one of the main objectives of the Project. Up to now the Project has not reached yet the ultimate target group in most of the countries. In this connection the different level of achievements in the countries will require special attention. Reinforcement of training activities in combination with improvement of attention and support to

the Project by the top management of the national institutions is especially required in:

- San Salvador
- Honduras
- Nicaragua

The planned activities are shown in Annex 4.

#### 4.2 Strengthening the Training Delivery System

The Project's effectiveness and efficiency could be fostered through the improvement of the sharing of instructional resources, duly revised and edited. This activity which will have to be carried out by the Project Management and STC's, and is considered as one of the most important objectives to be contemplated up to July 1987 (for details see Annex 4). In this context it was agreed between GTZ, PAHO and the Project Management to reinforce the office in San Jose, Costa Rica with a data processing unit (PC), in order to avoid time consuming processing of material and documents in PAHO's office in Washington and duplication of efforts in the countries.

#### 4.3 Implementation of an Integrated System for HRD

The favourable results achieved by the Project in many of the participating countries created the demand to develop an integral system for HRD for all the personnel of the institutions. AyA which is the most advanced institution, among those participating in the Project, could contribute substantially in the development with STC and hardware. This activity which was up to date not included in the Plan of Operation is now programmed to be initiated in February 1987 and will commence into the II Phase of the Project (for details see Annex 4).

#### 4.4 Improvement of Management and Productivity

Experiences of the Project Management and findings of the Mission revealed a substantial demand to improve the management capabilities and productivity of personnel in many of the institutions in the participating countries. This activity, also not included in the present Plan of Operation, but recommended by the Project Management and the Mission could be initiated at the end of Phase I of the Project (beginning January 1987) and carried on into a second Phase. This activity is mainly to be carried out by the Project Management and STC and could also be assisted by the top management of AyA and other institutions (for details see Annex 4).

## 5. CONCLUSIONS

In the history of technical cooperation, seldom, has a project of rather limited scope (in terms of the modest external financial support allotted for its implementation) achieved so much in such a short period. In addition to the concrete measurable results which are detailed in Chapter 3 above, the project has generated motivation and enthusiasm from among the nationals and those responsible for its execution.

The process of training as developed by the project represents a point of departure from previous approaches, whereby the success of the training effort was measured solely by the number of training courses given in the course of time and the number of people trained.

Project's development and progress vary from one institution to the other, but, generally speaking, project's accomplishments to-date, are in accordance with project's timetable. Additionally, some activities -although not originally contemplated in the Plan of Operations, are being carried out in some institutions (INFOM in Guatemala, INAPA in Dominican Republic, and AyA in Costa Rica). In these institutions, the training process is moving into the broader process of Human Resources Development, and into Institutional Development.

Project's Plan of Operations is a well-thought-out document which, in addition to specifying project's expected outputs through a rational phasing of activities, defines clearly the functions and responsibilities of the parties concerned.

Individual project coordinators, supervisors and instructors who received training in their specific areas of responsibilities are called upon to carry out training activities in their country of origin as well as in other countries of the sub-region, thus fostering the implementation of the UN's advocated policy of Technical Cooperation among Developing Countries (TCDC).

IDB's delay in joining the project, in addition to being accountable for the rather slow progress made in the leak detection component of the project has necessitated replanning of activities, and more importantly, places a heavy burden on the shoulder of the International Project Manager, who is performing both the administrative and technical functions which were to be assumed by two people.

## 6. RECOMMENDATIONS

Although there are discrepancies in the level of achievements from among the countries involved in the project, it is established that much progress has been made towards the accomplishment of project's objectives. In particular, the project is successful in establishing in

each of the participating countries a permanent training delivery sub-system which is viewed as a managerial tool, and without which the water supply and sanitation agencies will not be able to improve the levels of services, and to overcome their administrative and financial shortcomings.

From the aforementioned, there emerges the need to strengthen the institutional and managerial capabilities of the sector agencies, with a view to ascertaining that the agencies will function on self-sustaining and sound financial basis. Therefore, the recommendations which follow originate from meeting such a need, and are offered to: PAHO, CAPRE, IDB, the countries, and GTZ.

#### 6.1 Recommendations to PAHO

As the Executing Agency of the project, PAHO should prepare the Project Completion Report covering the period January 1985-July 1987 for submission to all parties concerned. The Report would provide a detailed account of project's achievements and costs, including the identification of specific indicators which establish that the sector agencies are committed to continue project's activities, on a self-sustaining basis, after the external assistance is withdrawn.

In collaboration with GTZ and IDB, and in consultation with CAPRE, PAHO should elaborate a Plan of Operations for the second phase of the Project which is expected to begin in July 1987 and to last until July 1989. Project's activities during the second phase will be in accordance with the proposals made in Annex 5, and will focus primarily on Human Resources and Institutional Development, with a view to strengthening the sector agencies' capabilities to fulfill their training and management functions so as to provide the levels of services which are and will be required in an ever-expanding program of water supply and sanitation in the sub-region.

PAHO should promote the establishment of a centralized, computerized information system at the Project Management office in AyA, Costa Rica that will: 1) provide up-to-date information on project's development and progress, and 2) disseminate information to the countries, with particular reference to the production of training manuals, instructional and audio-visual materials, in order to avoid the duplication of efforts.

Concurrently with the above, and in compliance with the stipulations of the agreement signed by the parties concerned, PAHO should undertake to strengthen the project management in Costa Rica in respect of its reporting system.

## 6.2 Recommendations to CAPRE

CAPRE, the Association of the Directors and Managers of the water supply and sanitation agencies in the sub-region was instrumental in bringing the project into existence, and in securing financial support for its execution. CAPRE, nevertheless, needs to strengthen its position and play a leading role in project implementation, and, above all, should formally request technical assistance to GTZ, through PAHO, for project extension into a second phase.

CAPRE should also avail it-self of the experience under the project to formulate policies and develop a long-term comprehensive plan which should enable the agencies to respond efficiently to the likely, ever-increasing qualitative and quantitative demands for water supply and sanitation services in the sub-region.

## 6.3 Recommendations to IDB

IDB's financial support to the project is mostly in the area of leak detection. Of the US\$685,000 equivalent allocated to project execution, US\$141,000 and US\$75,000 equivalent are earmarked for the purchase of training and leak detection equipment, and for short-term consultants, respectively. In view of the progress made to-date towards the achievement of project's objectives, it is considered that fewer STC's than originally contemplated will be required during the second phase. Therefore, it is suggested that the US\$75,000 equivalent earmarked for STC's in IDB's budget proposal be utilized for the purchase of training and leak detection equipment.

## 6.4 Recommendation to the Water Supply and Sanitation Agencies

Many of the water supply and sanitation agencies are currently receiving assistance from such other sources as the World Bank (WB), and IDB in the areas of institutional development and leak detection. Such assistance is afforded through private consulting firms under contract with the agencies. It is highly desirable that the agencies should develop an efficient coordination mechanism, in order to ensure that all activities specifically related to institutional development and leak detection are carried out in a complementary manner.

## 6.5 Recommendation to GTZ

GTZ's technical assistance to the project has awakened awareness on the need to strengthen the institutional and managerial capability of the sector agencies, with a view to ensuring that these will grow and function on a sound financial and self-sustaining basis. Project's achievements so far establish the basis for the extension of project's activities into a second phase, in the specific areas of Human Resources and Institutional Development. To this end, it is suggested



that GTZ would continue its support to the project for a period of two years, starting in July 1987, and in accordance with the proposal which is detailed in Annex 5.

#### 7. ACKNOWLEDGMENT

This mission proved to be challenging and professionally rewarding to the Consultants. Its successful completion is due mostly to the dynamism and competence of the Project Manager, as well as to the officials of the water supply and sanitation agencies who spared no time in providing ample and pertinent information. For this, and for their courtesies, the Consultants wish to express appreciation.

## ANNEX 1

| NAME                          | POSITION  | INSTITUTION |
|-------------------------------|---|-------------|
| COSTA RICA                    |   |             |
| Ing. Eladio Prado Castro      | Presidente Ejecutivo  | AyA         |
| Ing. Herbert Farrer Crespo    | Gerente Operacional   | AyA         |
| Lic. Jorge Alfaro Ulate       | Gerente Administrativo  | AyA         |
| Ing. Ricardo Castro Castro    | Director de Operaciones y<br>Coordinador Grupos de Trabajo<br>en Operación y Manten. (GTOM) |             |
| Ing. Carlos Leiva Milano      | Ingeniero Jefe Div. Pacífico Norte<br>Coordinador del Proyecto Piloto                       |             |
| Ing. Víctor Calvo Balma       | Jefe Depto. Ingeniería Operaciones  |             |
| Sr. José Mario Zuñiga Alvarez | Coordinador Unidad de Adiestramiento  |             |
| GUATEMALA                     |   |             |
| Ing. Marco T. Ventura R.      | Superintendente   | EMPAGUA     |
| Ing. Walter Omar Chuy V.      | Operación y Mantenimiento   | UNEPAR      |
| Ing. Alejandro Castro         | Ing. de País OPS/OMS  | OPS/OMS     |
| Marco A. Marroquin Gómez      | Jefe Capacitación   | INFOM       |
| Julián Antonio Duarte J.      | Jefe, Depto. de Operac/Manten.  | INFOM       |
| Luis Rodolfo Castillo G.      | Jefe de la Unidad Des. Instituc.  | EMPAGUA     |
| Rafael Horacio Ceballos T.    | Auxiliar Superintendencia   | EMPAGUA     |
| Salvador Obando Garrido       | Técnico en Capacitación   | INFOM       |
| Hugo Roberto Corzo            | Unidad de Electromecánica   | EMPAGUA     |

| NAME                    | POSITION   | INSTITUTION |
|-------------------------|--|-------------|
| PANAMA                  |  |             |
| Lic. Pedro Rueda        | Director Ejecutivo   | IDAAN       |
| Ing. Rodolfo Tejada     | Director de Operaciones Logísticas,<br>Coordinador Nacional        |             |
| Ing. Rodrigo Barragán   | Sub-Director Operaciones<br>Coordinador Nacional Substituto        |             |
| Ing. Abilio Pitii       | Sub-Director Acueducto Región<br>Metropolitana, Coordinador GTOM   |             |
| Ing. Ambar M. de Pinzón | Jefe, Depto. Asistencia Técnica<br>Coordinador substituto GTOM     |             |
| Lic. Elvia E. de Espino | Adiestramiento, Coordinadora UAS,<br>Instructora                   |             |
| Lic. Cristóbal Tejeira  | Jefe, Depto de Adiestramiento,<br>Coordinador substituto           |             |
| Ing. Felix Quiroz       | Jefe, Depto. Medidores, Instructor<br>Capacitación, Proyecto       |             |
| Lic. Julio Alzamdra     | Control de Aguas, Instructor,<br>Capacitación                      |             |
| Ing. José U. Romoulton  | Jefe, Depto. Optimización de<br>Sistemas, Instructor, Capacitación |             |
| Ing. Armando Millán     | Jefe, Depto. Electromecánica, Instr.<br>Capacitación               |             |
| Ing. Arnolfo Menendez   | Depto. Alcantarillado, Instructor,<br>Capacitación                 |             |

| NAME                     | POSITION   | INSTITUTION                       |
|--------------------------|--|-----------------------------------|
| EL SALVADOR              |  |                                   |
| Dr. Benjamín Valdez N.   | Ministro de Salud Pública y Asistencia Social              | Ministerio de Salud               |
| Ing. Orlando Nabasco     | Presidente ANDA  | ANDA                              |
| Ing. Reinaldo Villeda    | Gerente de Proyectos y Obras de ANDA, Coordinador Nacional | ANDA                              |
| Ing. Roberto Walsh       | Coordinador UAS  | ANDA                              |
| Ing. J.A. Borja Gomez    | Coordinador GTOM   | ANDA                              |
| José Oliva Alfane        | Coordinador GTOM   | PLANSABAR                         |
| Israel Flores            | Departamento O & M   | PLANSABAR                         |
| Ricardo Nuñez            | UNDP   | ANDA<br>(PLANSABAR)               |
| Dr. Carlos A. Villatoro  | Director Saneamiento                                       | Ministerio de Salud               |
| Dr. Raúl Paredes Lopez   | Representante de País                                      | OPS/OMS                           |
| Ing. Walter Amorín       | Ingeniero Sanitario  | OPS/OMS                           |
| HONDURAS                 |  |                                   |
| Ing. Julio Ulpade        | Director O & M, Coordinador Nac.                           | SANAA                             |
| Ing. Luis Alberto Romero | Coordinador UAS  | SANAA                             |
| Lic. Denis A. Murcia     | Coordinador GTOM   | SANAA                             |
| Ing. Jorge Mendez        | Formación Supervisores GTOM                                | División de Saneamiento Ambiental |
| Ing. José Pérez Carrión  | Ingeniero de País  | OPS/OMS                           |

| NAME                    | POSITION  | INSTITUTION    |
|-------------------------|---|----------------|
| REPUBLICA DOMINICANA    |   |                |
| Ing. Julio Suero M.     | Gerente General de INAPA,<br>Presidente Ejecutivo del CAPRE | INAPA<br>CAPRE |
| Ing. Oscar Vargas       | Director O & M, Coordinador Nac.                            | INAPA          |
| Lic. Margarita Perallón | Coordinador UAS   | INAPA          |
| Lic. Carlos Barrientos  | División Normas Tarifarias<br>Coordinador GTOM              | INAPA          |
| Lic. Miledy Guzmán      | Coordinador UAS   | CAASD          |
| Ing. Rubén Esquea       | Coordinador GTOM  | CAASD          |
| Ing. Raimundo Hederra   | Ingeniero de País   | OPS/OMS        |

ANEXO 2

ACTIVIDADES REALIZADAS  
ENERO 1985 A JUNIO 1986

| Nº  | ACTIVIDADES                               | PERIODO                  | PAIS SEDE<br>EVENTO | PERSONAL     |               |
|-----|---|--------------------------|---------------------|--------------|---------------|
|     |   |                          |                     | Nº PARTICIP. | CONSULTORIA   |
| 4.1 | FASE PREVIA DE INSTALACIÓN                |                          |                     |              |               |
| a.  | Contratar gerente                         | AGO/84 a ENE/85          | COSTA RICA          | -            | GTZ/OPS       |
| a.1 | I Reunión comité                          | MAY/84                   |                     | 13           | OPS           |
| b.  | Instalar U.E.R.                           | FEB/85                   | COSTA RICA          | -            | Gerente/AYA   |
| c.  | Implantar mecanismos                      | MAR. ABR/85              | COSTA RICA          | 05           | Gerente/AYA   |
| 4.2 | FASE DE PROGRAMACIÓN                      |                          |                     |              |               |
| a.  | Inventario recursos adiestramiento        | OCT a DIC/84 y<br>JUN/85 | PAISES REGIÓN       | -            | STC y Gerente |
| b.  | Diagnóstico necesidad adiestramiento      | OCT a DIC/84 y<br>JUN/85 | PAISES REGIÓN       | 82           | STC y Gerente |
| c.  | Asesoría designación coordinadores        | JUN/85                   | PAISES REGIÓN       | -            | Gerente       |
| d.  | Asesoría planificación U.As y<br>G.T.O.M. | JUN. NOV y DIC/85        | PAISES REGIÓN       | -            | Gerente       |
| e.  | Elaborar plan de trabajo                  |                          |                     |              |               |
| e.1 | Rediseño plan de trabajo                  | MAR/85                   | WASHINGTON          | -            | OPS/Gerente   |
| e.2 | Elaboración plan de trabajo               | MAR/85                   | WASHINGTON          | -            | Gerente       |
| f.  | Aprobación plan de trabajo                | ABR/85                   | R. DOMINICANA       | -            | OPS/Gerente   |
| f.1 | II Reunión comité                         | ABR/85                   | R. DOMINICANA       | 13           | OPS/Gerente   |
| f.2 | Seminario para dirigentes                 | ABR/85                   | R. DOMINICANA       | 28           | OPS/Gerente   |
| f.3 | V Reunión CAPRE                           | ABR/85                   | R. DOMINICANA       | 10           | OPS/Gerente   |

| Nº  | ACTIVIDADES   | PERIODO                      | PAIS SEDE<br>EVENTO | PERSONAL     |               |
|-----|---|------------------------------|---------------------|--------------|---------------|
|     |   |                              |                     | Nº PARTICIP. | CONSULTORIA   |
| 4.3 | FASE DE CREACIÓN DE INFRA ESTRUCTURA                    |                              |                     |              |               |
| a.  | Selección y contratación expertos                       | SET. DIC/85 y<br>ENE/86      | COSTA RICA          | -            | OPS/Gerente   |
| b.  | Preparación material didáctico                          | SET. OUT. DIC/85<br>y ENE/86 | COSTA RICA          | -            | STC y Gerente |
| c.  | Instalación de U.As                                     |                              |                     |              |               |
| c.1 | Taller sobre optimización sistemas                      | ABR/85                       | COSTA RICA          | 13           | Gerente/AYA   |
| c.2 | Seminario sensibilización para im-<br>plantar programa  | AGO. SET/85                  | COSTA RICA          | 17           | Gerente/STC   |
| c.3 | Preparación infraestructura a nivel<br>nacional         | AGO. SET/85                  | COSTA RICA          | -            | Gerente/AYA   |
| 4.4 | FASE DE ADIESTRAMIENTO DE PERSONAL<br>DE U.As Y U.D.C.F |                              |                     |              |               |
| a.  | Contratación expertos                                   | SET. DIC/85 y<br>ENE/86      | COSTA RICA          | -            | OPS/Gerente   |
| b.  | Curso para coordinadores U.As                           | OCT/85                       | COSTA RICA          | 12           | STC/Gerente   |
| b.1 | Seguimiento y evaluación                                | NOV/85                       | PAISES REGIÓN       | -            | STC           |
| c.  | Curso para coordinadores G.T.O.M.                       | ENE/86                       | COSTA RICA          | 18           | STC/Gerente   |
| c.1 | Seguimiento y evaluación                                | FEB. MAR/86                  | PAISES REGIÓN       | -            | STC           |
| d.  | Cursos regionales sobre técnicas de<br>adiestramiento   |                              |                     |              |               |
| d.1 | Curso formación instructores (1º<br>grupo)              | DIC/85                       | COSTA RICA          | 22           | STC y Gerente |
| d.2 | Curso formación instructores (2º-<br>grupo)             | ENE/86                       | R. DOMINICANA       | 34           | STC y Gerente |



| Nº                              | ACTIVIDADES  | PERIODO     | PAIS SEDE<br>EVENTO | PERSONAL     |               |
|---------------------------------|--|-------------|---------------------|--------------|---------------|
|                                 |  |             |                     | Nº PARTICIP. | CONSULTORIA   |
| 4.4                             | Continuación....                                   |             |                     |              |               |
| e..                             | Cursos nacionales sobre técnicas de adiestramiento |             |                     |              |               |
| e.1                             | Formación de supervisores de Costa Rica            | MAR/86      | COSTA RICA          | 17           | STC y Gerente |
| e.2                             | Formación de supervisores de Guatemala             | ABR/86      | GUATEMALA           | 15           | Gerente       |
| e.3                             | Formación de supervisores de Nicaragua             | MAY. JUN/86 | NICARAGUA           | 17           | STC           |
| e.4                             | Formación de supervisores de Honduras              | JUN/86      | HONDURAS            | 20           | STC           |
| <u>TOTAL PARTICIPANTES: 336</u> |  |             |                     |              |               |

DOCUMENTOS PRODUCIDOS DENTRO DEL  
CONVENIO SUBREGIONAL DE COOPERACION TECNICA GTZ/OPS

**DOCUMENTO****PAIS****ANALISIS OCUPACIONALES**

|   |                      |
|---|----------------------|
| - Ingeniero de Operaciones                      | República Dominicana |
| Manual para Mecánico de Mantenimiento           | Panamá               |
| Operador de Plantas Potabilizadoras             | Panamá               |
| Electricista                                    | República Dominicana |
| Mecánico  | República Dominicana |
| Encargado de Agencia Comercial                  | República Dominicana |
| Encargado de Brigada de Mantenimiento de la Red | República Dominicana |
| Operador de Bombas                              | Honduras             |
| Encargado de Aforos Pitométricos                | Honduras             |
| Operador de Plantas de Tratamiento              | Honduras             |
| Fontanero                                       | Honduras             |
| Encargado de Oficina Regional                   | Costa Rica           |
| Lector de Hidrómetros                           | Costa Rica           |

**CONFECCION DE MODULOS PARA APOYO DIDACTICO EN CAPACITACION**

- |   |                      |
|---|----------------------|
| 1. Primer avance modular del proyecto de capacitación   | Honduras             |
| 2. Módulos para capacitación de Supervisores en Operación y Mantenimiento                     | Honduras             |
| 3. Manual de técnicas para la realización del análisis ocupacionales                          | República Dominicana |
| 4. Procedimientos para efectuar una identificación de las necesidades de capacitación         | República Dominicana |
| 5. Conocimientos Generales sobre los métodos de enseñanza para instructores de capacitación   | República Dominicana |
| 6. Curso para formación de supervisores de capacitación compuesto por los siguientes módulos: | Costa Rica           |
| - Definición de Términos  |                      |
| - Sistemas Organizacionales y Estructura Organizacional                                       |                      |
| - Concepto del Supervisor   |                      |
| - Habilidades de un Supervisor  |                      |
| - Estudio de Casos  |                      |
| - Papel del Supervisor  |                      |
| - Capacitar para qué?   |                      |
| - Objetivos del instructor  |                      |

- Reunión de Capacitación
- Levantamiento de necesidades de capacitación
- Los Recursos Individuales
- Exámenes y pruebas
- Seguimiento y Evaluación de la capacitación
- Técnicas para realización del análisis ocupacional

#### CURSOS

- Curso Formación de Coordinadores de Unidades de Adiestramiento Costa Rica  
Octubre de 1985
- Curso Formación de Instructores de Capacitación Costa Rica  
Dic. de 1985
- República Dominicana  
Enero de 1986
- Curso Formación de Coordinadores de Grupos de Trabajo y Mantenimiento, GTOM Costa Rica  
Febrero de 1986

#### INFORMES

Informe de control de pérdidas en la Ciudad de Guatemala

I Informe Semestral de labores del proyecto, 1985

ANEXO II Informe del Taller sobre Optimización de Sistemas de Agua Potable

ANEXO III Complementación del diagnóstico por país

- Tabulación de la evaluación del Curso de Formación de 18 Coordinadores de Grupos de Trabajo en Operación y Mantenimiento Costa Rica
- Tabulación de la evaluación del Curso de Formación de 34 Instructores de Capacitación República Dominicana
- Tabulación de evaluación del Curso de Formación de 22 Instructores de Capacitación Costa Rica
- Tabulación de la evaluación del Curso de Formación de 12 Coordinadores de Unidades de Adiestramiento Costa Rica

- Informe sobre la Evaluación de las tareas asignadas a los instructores de Capacitación en sus respectivos países
- Informe sobre la evaluación de las tareas designadas a los Coordinadores de UAS en sus respectivos países
- Informe Final del Consultor Helio de Melo
- Informe de avance del Proyecto de Costa Rica

ANNEX 3

TRAINING SYSTEM FOR TECHNICAL PERSONNEL OF WATER SUPPLY AND  
SANITATION INSTITUTIONS IN CENTRAL AMERICA, PANAMA AND DOMINICAN REPUBLIC

| PERIOD/<br>DATE   | COUNTRY        | SUMMARY OF ACTIVITIES IN PARTICIPATING COUNTRIES |                                 |  |                               |    | PERSONS<br>: TRAINED |
|-------------------|----------------|--|---------------------------------|--|-------------------------------|----|----------------------|
|                   |                | INSTITUTION                                      | COORDINATOR                     | ACTIVITIES   | DOCUMENTS                     |    |                      |
| 15-19<br>April/85 | Costa<br>Rica  | Instituto Cos-<br>taricense de<br>Acueductos y   | Ing. José Carlos<br>Solano (N)  | Taller sobre Optimización de Sis-<br>temas, Costa Rica | (Regional)                    | 7  |                      |
| 20-25<br>Oct/85   |                | Alcantarilla-<br>dos (AyA)                       | Mario Zuñiga Al-<br>varez (UAS) | Curso Coordinadores UAS, Costa<br>Rica                 | (Regional)                    | 2  |                      |
| Dec/85            |                |  | Ing. Ricardo<br>Castro (GTOM)   | Curso Coordinadores GTOM, Costa<br>Rica                | (Regional)                    | 7  |                      |
| 7-17<br>Ene/86    |                |  |                                 | Formación Instructores, Costa<br>Rica                  | (Regional)                    | 7  |                      |
| 10-21<br>Mar/86   |                |  |                                 | Formación Supervisores                                 | Encargado de Oficina Regional | 15 |                      |
| Jun/86            |                |  |                                 |  | Lector de Hidrómetros         |    |                      |
| 15-19<br>Apr/85   | El<br>Salvador | Administración<br>Nacional de<br>Acueductos y    | Ing. Renato<br>Villeda (N)      | Taller sobre Optimización de<br>Sistemas, Costa Rica   | (Regional)                    | 2  |                      |
| 20-25<br>Oct/85   |                | Alcantarilla-<br>dos (ANDA)                      | Ing. Roberto<br>Wash (UAS)      | Curso Coordinadores UAS, Costa<br>Rica                 | (Regional)                    | 2  |                      |
| Dec/85            |                |  | Ing. J.A. Borja<br>Gomez (GTOM) | Curso Coordinadores GTOM, Costa<br>Rica                | (Regional)                    | 2  |                      |
| 10-21<br>Mar/86   |                |  |                                 | Formación Supervisores                                 | (Regional)                    | 5  |                      |
| 14-23<br>Jul/86   |                |  |                                 | Formación Instructores                                 | (Regional)                    | 15 |                      |

**TRAINING SYSTEM FOR TECHNICAL PERSONNEL OF WATER SUPPLY AND  
SANITATION INSTITUTIONS IN CENTRAL AMERICA, PANAMA AND DOMINICAN REPUBLIC**

| SUMMARY OF ACTIVITIES IN PARTICIPATING COUNTRIES |                        |   |                               |   |   |                    |  |
|--|------------------------|---|-------------------------------|---|---|--------------------|--|
| PERIOD/<br>DATE                                  | COUNTRY                | INSTITUTION   | COORDINATOR                   | ACTIVITIES  | DOCUMENTS   | PERSONS<br>TRAINED |  |
| Ene/86   | El Salvador<br>(cont.) | Plan Nacional de Saneamiento Básico Rural (PLANSABAR) | Ing. José Oliva A. (GTOM)     | Curso Coordinadores GTOM                          | (Regional)  | 1                  |  |
| 14-23<br>July/86                                 |                        |   |                               | Formación Instructores, Rep. Dominicana           | (Regional)  | 3                  |  |
| Ago/86   |                        |   |                               | Formación Supervisores                            | Informe de la Comisión del Convenio de Cooperación Técnica de OPS/GT7 sobre la situación actual de O & M de Acueductos Rurales en El Salvador | 5                  |  |
| 15-19<br>Apr/85                                  | Guatemala              | Instituto de Fomento Municipal (INFOM)                | Ing. Julián Duarte J. (N)     | Taller sobre Optimización de Sistemas, Costa Rica | (Regional)  | 3                  |  |
| 20-25<br>Oct/85                                  |                        |   | Lic. Marco A. Marroquín (UAS) | Curso Coordinadores UAS, Costa Rica               | (Regional)  | 1                  |  |
| 7-17<br>Ene/86                                   |                        |   | Lic. Luis R. Castillo (GTOM)  | Curso Coordinadores GTOM, Costa Rica              | (Regional)  | 1                  |  |
| 14-23<br>Jul/86                                  |                        |   |                               | Formación de Instructores, Rep. Dominicana        | (Regional)  | 2                  |  |
| 7-18<br>Apr/86                                   |                        |   |                               | Formación de Supervisores                         | (Regional)<br>Plan de Adiestramiento  | 5                  |  |



**TRAINING SYSTEM FOR TECHNICAL PERSONNEL OF WATER SUPPLY AND  
SANITATION INSTITUTIONS IN CENTRAL AMERICA, PANAMA AND DOMINICAN REPUBLIC**

| S U M M A R Y O F A C T I V I T I E S I N P A R T I C I P A T I N G C O U N T R I E S |                      |  |                                   |   |   |                    |  |
|---|----------------------|--|-----------------------------------|---|---|--------------------|--|
| PERIOD/<br>DATE   | COUNTRY              | INSTITUTION  | COORDINATOR                       | ACTIVITIES                                    | DOCUMENTS                                 | PERSONS<br>TRAINED |  |
| 20-25<br>Oct/85   | Guatemala<br>(cont.) | Empresa Muni-<br>cipal de Agua<br>(EMPAGUA)                            | Ing. Marco Tulio<br>Ventura (UAS) | Curso Coordinadores UAS, Costa<br>Rica        | (Regional)                                | 1                  |  |
| 7-17<br>Ene/86  |                      |  | Ing. Carlos<br>Arriola (GTOM)     | Curso Coordinadores GTOM, Costa<br>Rica       | (Regional)                                | 1                  |  |
| 14-23<br>Jul/86   |                      |  |                                   | Formación de Instructores, Rep.<br>Dominicana | (Regional)                                | 2                  |  |
| 7-18<br>Apr/86  |                      |  |                                   | Formación de Supervisores                     | (Regional)<br>Manual Análisis Ocupacional | 6                  |  |
| 20-25<br>Oct/85   |                      | Unidad Ejecu-<br>tora Programa<br>de Acueductos<br>Rurales<br>(UNEPAR) | Ing. Walter Chuy                  | Curso Coordinadores UAS, Costa<br>Rica        | (Regional)                                | 1                  |  |
| 7-17<br>Ene/86  |                      |  |                                   | Formación Instructores, Costa<br>Rica         | (Regional)                                | 2                  |  |
| 7-18<br>Apr/86  |                      |  |                                   | Formación Supervisores                        | (Regional)                                | 3                  |  |
| 7-18<br>Apr/86  |                      | División de<br>Saneamiento<br>del Medio<br>(D.S.M.)                    |                                   | Formación Supervisores                        | (Regional)                                | 2                  |  |

**TRAINING SYSTEM FOR TECHNICAL PERSONNEL OF WATER SUPPLY AND  
SANITATION INSTITUTIONS IN CENTRAL AMERICA, PANAMA AND DOMINICAN REPUBLIC**

| SUMMARY OF ACTIVITIES IN PARTICIPATING COUNTRIES |          |   |   |   |  |                    |
|--|----------|---|---|---|--|--------------------|
| PERIOD/<br>DATE                                  | COUNTRY  | INSTITUTION   | COORDINATOR   | ACTIVITIES  | DOCUMENTS  | PERSONS<br>TRAINED |
| 15-19<br>Apr/85                                  | Honduras | Servicio Autónomo Nacional de Acueductos y Alcantarillado (SANAA) | Ing. Julio Melpade (N)<br>Ing. Luis A. Romero (UAS) | Taller sobre Optimización de Sistemas, Costa Rica | (Regional)   | 2                  |
| 20-25<br>Oct/85                                  |          |   | Lic. Denis A. Marcial (GTOM)                        | Curso Coordinadores UAS, Costa Rica               | (Regional)   | 2                  |
| Dec/85   |          |   |   | Curso Coordinadores GTOM, Costa Rica              | (Regional)   | 2                  |
| 7-17<br>Ene/86                                   |          |   |   | Formación Instructores, Rep. Dominicana           | (Regional)   | 2                  |
| 20-28<br>Jun/86                                  |          |   |   | Formación de Supervisores                         | Operador de Bombas, encargado de Aforos Pitométricos. Operador de Plantas de Tratamiento. Fontanero. Módulos para Capacitación de Supervisores O & M | 15                 |
| 20-28<br>Jun/86                                  |          | División de Saneamiento Ambiental                                 | Ing. Jorge Mendez                                   | Formación de Supervisores                         | (Regional)   | 4                  |

**TRAINING SYSTEM FOR TECHNICAL PERSONNEL OF WATER SUPPLY AND  
SANITATION INSTITUTIONS IN CENTRAL AMERICA, PANAMA AND DOMINICAN REPUBLIC**

| SUMMARY OF ACTIVITIES IN PARTICIPATING COUNTRIES |           |   |   |  |            |                    |
|--|-----------|---|---|--|------------|--------------------|
| PERIOD/<br>DATE                                  | COUNTRY   | INSTITUTION   | COORDINATOR   | ACTIVITIES   | DOCUMENTS  | PERSONS<br>TRAINED |
| 15-19<br>Apr/85                                  | Nicaragua | Instituto<br>Nicaragüense<br>de Acueductos<br>y Alcantari-<br>llados (INAA) | Alfonso Alfaro<br>(UAS)<br>Ing. Sergio<br>Tercero T. (GTOM) | Taller sobre Optimización de<br>Sistemas, Costa Rica | (Regional) | 2                  |
| 20-25<br>Oct/85                                  |           |   |   | Curso Coordinadores UAS, Costa<br>Rica               | (Regional) | 1                  |
| Dec/85   |           |   |   | Curso Coordinadores GTOM, Costa<br>Rica              | (Regional) | 2                  |
| 7-17<br>Ene/86                                   |           |   |   | Formación Instructores, Costa<br>Rica                | (Regional) | 5                  |
| 25 Mayo<br>6 Jun/86                              |           |   |   | Formación Supervisores                               | (Regional) | 21                 |
| 15-19<br>Apr/85                                  | Panama    | Instituto de<br>Acueductos y<br>Alcantarilla-<br>dos Nacionales<br>(INAA)   | Ing. Rodolfo<br>Tejada (N)                                  | Taller sobre Optimización de<br>Sistemas, Costa Rica | (Regional) | 2                  |
| 20-25<br>Oct/85                                  |           |   | Lic. Elvia de<br>Espino (UAS)                               | Curso Coordinadores UAS, Costa<br>Rica               | (Regional) | 3                  |
| Dec/85   |           |   | Ing. Abilio<br>Pitii (GTOM)                                 | Curso Coordinadores GTOM, Costa<br>Rica              | (Regional) | 3                  |
| Ene/86   |           |   |   | Formación de Instructores, Costa<br>Rica             | (Regional) | 6                  |

**TRAINING SYSTEM FOR TECHNICAL PERSONNEL OF WATER SUPPLY AND  
SANITATION INSTITUTIONS IN CENTRAL AMERICA, PANAMA AND DOMINICAN REPUBLIC**

| PERIOD/<br>DATE | COUNTRY              | SUMMARY OF ACTIVITIES IN PARTICIPATING COUNTRIES               |                               |   |   |    | PERSONS<br>TRAINED |
|-----------------|----------------------|--|-------------------------------|---|---|----|--------------------|
|                 |                      | INSTITUTION  | COORDINATOR                   | ACTIVITIES  | DOCUMENTS   |    |                    |
| 10-21<br>Mar/86 | Panama<br>(cont.)    |  |                               | Formación de Supervisores, Costa Rica             | (Regional)<br>Manual para Mecánica de Mantenimiento. Operador de Plantas Potabilizadoras  | 6  |                    |
| 15-19<br>Apr/85 | República Dominicana | Instituto Nacional de Aguas Potables y Alcantarillados (INAPA) | Ing. Oscar Vargas (N)         | Taller sobre Optimización de Sistemas, Costa Rica | (Regional)  | 2  |                    |
| 20-25<br>Oct/85 |                      |  | Lic. Margarita Perallón (UAS) | Curso Coordinadores UAS, Costa Rica               | (Regional)  | 1  |                    |
| 7-17<br>Ene/86  |                      |  | Lic. Carlos Barrientos (GTOM) | Curso Coordinadores GTOM, Costa Rica              | (Regional)  | 1  |                    |
| 15-19<br>Apr/86 |                      |  |                               | Formación Instructores, Rep. Dominicana           | (Regional)  | 5  |                    |
| 16-27<br>Jun/86 |                      |  |                               | Formación Supervisores                            | Análisis Ocupacional. Manual de Técnicas para la realización del Análisis Ocupacional. Procedimientos para efectuar las necesidades de capacitación | 13 |                    |

TRAINING SYSTEM FOR TECHNICAL PERSONNEL OF WATER SUPPLY AND  
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| SUMMARY OF ACTIVITIES IN PARTICIPATING COUNTRIES |                              |   |                             |   |                 |                    |
|--|------------------------------|---|-----------------------------|---|-----------------|--------------------|
| PERIOD/<br>DATE                                  | COUNTRY                      | INSTITUTION   | COORDINATOR                 | ACTIVITIES                                      | DOCUMENTS       | PERSONS<br>TRAINED |
| 20-25<br>Oct/85                                  | República<br>Domini-<br>cana | Corporación de<br>Acueducto y<br>Alcantarilla-                                      | Lic. Miledy<br>Guzmán (UAS) | Curso de Coordinadores UAS,<br>Costa Rica       | (Regional)      | 1                  |
| 7-17<br>Ene/86                                   | (cont.)                      | dos de Santo<br>Domingo<br>(CAASD)  | Ing. Rubén<br>Esquea (GTOM) | Curso de Coordinadores GTOM,<br>Costa Rica      | (Regional)      | 1                  |
| 15-19<br>Apr/86                                  |                              |   |                             | Formación de Instructores, Rep.<br>Dominicana   | (Regional)      | 9                  |
| 10-27<br>Jun/86                                  |                              |   |                             | Formación Supervisores                          | (National S.A.) | 8                  |
| 7-17<br>Ene/86                                   |                              |   |                             | Formación de Coordinadores                      |                 | 1                  |
| 15-19<br>Apr/86                                  |                              | Corporación<br>del Acueducto<br>y Alcantari-<br>llados de<br>Santiago<br>(CORAASAN) |                             | Formación de Coordinadores,<br>GTOM, Costa Rica | (Regional)      | 1                  |
|  |                              |   |                             | Formación de Instructores, Rep.<br>Dominicana   | (Regional)      |                    |
| 16-27<br>Jun/86                                  |                              |   |                             | Formación de Supervisores                       | (National S.A.) | 2                  |

**ANEXO 4**

**NECESIDADES FUTURAS  
AGOSTO 1986 A DICIEMBRE 1987**

| Nº    | ACTIVIDADES  | PERIODO         | PAIS SEDE<br>EVENTO | PERSONAL     |                 |
|-------|--|-----------------|---------------------|--------------|-----------------|
|       |  |                 |                     | Nº PARTICIP. | CONSULTORIA     |
| 4.6   | FASE DE CONSOLIDACIÓN DEL PROGRAMA   |                 |                     |              |                 |
| a.    | Implantación del sistema de D.G. e I.P.  | ENE a DIC/87    | -                   | -            | GTZ/OPS         |
| a.1   | Selección y contratación expertos  | NOV/86          | COSTA RICA          | -            | GTZ/OPS         |
| a.2   | Preparación material didáctico   | DIC/86          | COSTA RICA          | -            | Gerente/STC     |
| a.3   | Seminario regional sensibilización para implantar programa                                       | ENE/87          | A CONVENIR          | 30           | OPS/Gerente/STC |
| a.4   | Curso regional formación de técnicos en D.G. e I.P.  | FEB/87          | A CONVENIR          | 21           | Gerente/STC     |
| a.5   | Preparación cursos y seminarios a nivel nacional   | MAR/87          | PAISES REGIÓN       | 21           | Técnicos D.G.   |
| a.6   | Seguimiento y evaluación   | ABR/87          | PAISES REGIÓN       | -            | STC             |
| a.7   | Realización de 42 cursos nacionales sobre D.G.   | ABR a NOV/87    | PAISES REGIÓN       | 700          | Técnicos DG/STC |
| a.8   | Realización de 42 seminarios nacionales sobre I.P.   | MAY a DIC/87    | PAISES REGIÓN       | 700          | Técnicos DG/STC |
| b.    | Fortalecimiento de la capacidad de adiestramiento existente en la sede del proyecto              | AGO/86 a DIC/87 | COSTA RICA          | -            | GTZ/OPS/AYA     |
| b.1   | Ampliación de las instalaciones de la U.E.R.   | AGO. SET/86     | COSTA RICA          | -            | AYA             |
| b.2   | Implantación de un sistema gerencial de informaciones a nivel regional (en computadora)          | NOV/86 a ENE/87 | COSTA RICA          | -            | OPS/Gerente     |
| b.2.1 | Contratación de un experto   | NOV/86          | COSTA RICA          | -            | GTZ/OPS         |
| b.2.2 | Preparación del flujo de entrada y salida para la computadora                                    | NOV. DIC/86     | COSTA RICA          | -            | STC/Gerente     |
| b.2.3 | Implantación del sistema con seguimiento y evaluación  | ENE/87          | PAISES REGIÓN       | -            | STC/Gerente     |
| b.3   | Instalación de un centro de capacitación en la sede para Centro América, Panamá y R. Dominicana. | ENE. DIC/87     | COSTA RICA          | -            | GTZ/OPS/AYA     |

| Nº    | ACTIVIDADES   | PERIODO      | PAIS SEDE<br>EVENTO | PERSONAL     |             |
|-------|---|--------------|---------------------|--------------|-------------|
|       |   |              |                     | Nº PARTICIP. | CONSULTORIA |
| c.    | Programación de cursos de formación sobre técnicos de O y M             | FEB. JUL/87  | PAISES REGION       | -            | STC/Gerente |
| c.1.  | Contratación expertos   | FEB/87       | COSTA RICA          | -            | GTZ/OPS     |
| c.2   | Preparación material didáctico  | MAR/87       | COSTA RICA          | -            | STC/Gerente |
| c.3   | Realización de 07 cursos regionales sobre técnicos de O y M             | ABR. JUL/87  | PAISES REGION       | -            | STC/Gerente |
| c.3.1 | Curso formación de técnicos en micromedición                            | ABR/87       | A CONVENIR          | 18           | STC         |
| c.3.2 | Curso formación de técnicos en macromedición                            | MAY/87       | A CONVENIR          | 18           | STC         |
| c.3.3 | Curso formación de técnicos en catastro de redes                        | MAY/87       | A CONVENIR          | 18           | STC         |
| c.3.4 | Curso formación de técnicos en pitometría                               | JUN/87       | A CONVENIR          | 18           | STC         |
| c.3.5 | Curso formación de técnicos en control operacional                      | JUN/87       | A CONVENIR          | 18           | STC         |
| c.3.6 | Curso formación de técnicos en mantenimiento civil y eletromecánico     | JUL/87       | A CONVENIR          | 18           | STC         |
| c.3.7 | Curso formación de técnicos en control de calidad de agua               | JUL/87       | A CONVENIR          | 18           | STC         |
| c.3.8 | Seguimiento y evaluación  | MAY. AGO/87  | PAISES REGION       | -            | STC/Gerente |
| d.    | Implantación del sistema integrado de recursos humanos                  | FEB A DIC/87 | PAISES REGION       | -            | GTZ/OPS     |
| d.1   | Contratación expertos   | FEB/87       | COSTA RICA          | -            | GTZ/OPS     |
| d.2   | Preparación de modelos  | MAR. ABR/87  | COSTA RICA          | -            | STC/Gerente |
| d.3   | Curso regional sobre formación de directores de recursos humanos        | ABR/87       | A CONVENIR          | 18           | STC/Gerente |
| d.4   | Curso sobre técnicas de reclutamiento y selección (Análisis del modelo) | MAY/87       | A CONVENIR          | 18           | STC/Gerente |
| d.5   | Curso sobre técnicas de control administrativo (Análisis del modelo)    | MAY/87       | A CONVENIR          | 18           | STC/Gerente |



| Nº                                      | ACTIVIDADES   | PERIODO         | PAIS SEDE<br>EVENTO | PERSONAL     |                          |
|---|---|-----------------|---------------------|--------------|--------------------------|
|   |   |                 |                     | Nº PARTICIP. | CONSULTORIA              |
| d.6                                     | Curso sobre técnicas de clasificación y valorización de puestos (Análisis del modelo) | JUN/87          | A CONVENIR          | 18           | STC/Gerente              |
| d.7                                     | Curso sobre técnicas de evaluación de desempeño (Análisis del modelo)                 | JUN/87          | A CONVENIR          | 18           | STC/Gerente              |
| d.8                                     | Implantación modelos analizados   | JUL. DIC/87     | PAISES REGION       | -            | Directores R.H.          |
| d.9                                     | Seguimiento y evaluación  | SET. NOV/87     | PAISES REGION       | -            | STC                      |
| d.10                                    | Reunión regional entre directores de recursos humanos (Intercambio de tecnología)     | DIC/87          | A CONVENIR          | 10           | STC/Gerente              |
| e.                                      | Aquisición de los equipos para U.As y O y M   | AGO. DIC/86     | PAISES REGION       | -            | GTZ/OPS                  |
| e.1                                     | Diagnóstico de las necesidades mínimas necesarias                                     | AGO. SET/86     | PAISES REGION       | -            | Coordinadores            |
| e.2                                     | Licitación, compra y ubicación de los equipos   | OCT. DIC/86     | A CONVENIR          | -            | OPS/Gerente/Em<br>presas |
| e.3                                     | Evaluación  | DIC/86 y MAR/87 | PAISES REGION       | -            | GTZ                      |
|   |   |                 |                     |              |                          |
| <p><u>TOTAL PARTICIPANTES: 1698</u></p> |   |                 |                     |              |                          |

**ACTIVIDADES PREVISTAS  
JULIO / 86 A MARZO / 87**

| Nº        | ACTIVIDADES  | PERIODO        | PAIS SEDE<br>EVENTO | PERSONAL     |                 |
|-----------|--|----------------|---------------------|--------------|-----------------|
|           |  |                |                     | Nº PARTICIP. | CONSULTORIA     |
| 4.2       | <b>FASE DE PROGRAMACIÓN</b>                                      |                |                     |              |                 |
| d.        | Asesoría plan U.D.C.F.   | A CONVENIR (*) | PAISES REGIÓN       | -            | Gerente         |
| 4.3       | <b>FASE DE CREACIÓN DE INFRAESTRUCTURA</b>                       |                |                     |              |                 |
| c.<br>c.1 | Instalación de U.As<br>Montaje de los centros de capacitación    | A CONVENIR (*) | PAISES REGIÓN       | -            | Gerente         |
| 4.4       | <b>FASE DE ADIESTRAMIENTO DE PERSONAL<br/>DE U.As Y U.D.C.F.</b> |                |                     |              |                 |
| d.        | Curso regional sobre planificación control y evaluación U.D.C.F. | A CONVENIR (*) | A CONVENIR          | 14           | STC/Gerente     |
| d.4       | Formación de supervisores de Rep. Dominicana                     | JUN. JUL/86    | R. DOMINICANA       | 15           | STC             |
| d.5       | Formación de supervisores de El Salvador                         | JUL/86         | EL SALVADOR         | 15           | STC             |
| d.6       | Formación de supervisores de Panamá                              | JUL/86         | PANAMÁ              | 15           | STC             |
| d.7       | Encuentro regional de coordinadores                              | AGO/86         | COSTA RICA          | 14           | Gerente         |
| d.8       | Seminario sensibilización nuevos dirigentes                      | A CONVENIR (*) | A CONVENIR          | 14           | STC/Gerente     |
| d.9       | III Reunión comité   | A CONVENIR (*) | A CONVENIR          | 14           | GTZ/OPS/Gerente |
| d.10      | Formación coordinadores U.As (2º grupo)                          | SET/86         | GUATEMALA           | 14           | STC/Gerente     |

Convenio GTZ/OPS

**ACTIVIDADES PREVISTAS**

SISTEMA REGIONAL DE ADIESTRAMIENTO  
CENTRO AMERICA-PANAMA-R. DOMINICANA

2/2

PERIODO, JULIO/86 A MARZO/87

| Nº   | ACTIVIDADES                        | PERIODO         | PAIS SEDE<br>EVENTO | PERSONAL     |             |
|--|------------------------------------|-----------------|---------------------|--------------|-------------|
|  |                                    |                 |                     | Nº PARTICIP. | CONSULTORIA |
| 4.5  | FASE ADIESTRAMIENTO PERSONAL O Y M |                 |                     |              |             |
| a.   | Realización 42 cursos              | SET/86 a DIC/87 | PAISES REGION       | 630          | STC/Gerente |
| b.   | Revisión material didáctico        | NOV/86 a DIC/87 | PAISES REGION       | -            | STC/Gerente |
| c.   | Evaluación proyecto                | JUN/86 y JUN/87 | PAISES REGION       | -            | GTZ         |
| <p>(*) <u>Recursos BID</u><br/><u>Previsión participantes: 745</u></p> |                                    |                 |                     |              |             |

ANNEX 5

TRAINING SYSTEM FOR TECHNICAL PERSONNEL OF  
WATER SUPPLY AND SANITATION INSTITUTIONS IN  
CENTRAL AMERICA, PANAMA, AND THE  
DOMINICAN REPUBLIC

PROPOSAL FOR GTZ CONTRIBUTION  
1987-1989

1. PROJECT MANAGEMENT

1.1 Salaries

|   |                       |
|---|-----------------------|
| 1. Project Manager (24 mm/exp. x US\$4,500)   | US\$ 120,000          |
| 2. Administrator (24 mm/exp. x US\$1,200)     | 28,800                |
| 3. Short Term Experts (12 mm/exp x US\$3,000) | 36,000                |
| SUBTOTAL:                                     | US\$ 184,800<br>===== |

1.2 Travel Expenses

|   |                      |
|---|----------------------|
| 1. Project Manager (30 round trip int. a US\$650)   | US\$ 19,500          |
| 2. Short Term Experts (18 round trip int a US\$650) | 11,700               |
| SUBTOTAL:   | US\$ 31,200<br>===== |

1.3 Per Diem

|  |                      |
|--|----------------------|
| 1. Project Manager (200 ds US\$110/d)    | US\$ 22,000          |
| 2. Short Term Experts (365 ds US\$110/d) | 40,150               |
| SUBTOTAL:                                | US\$ 62,150<br>===== |

2. STRENGTHENING ACTIVITIES

|   |                      |
|---|----------------------|
| Training Infrastructure on El Salvador, Honduras,<br>Nicaragua (3 x US\$20,000) | US\$ 60,000<br>===== |
|---|----------------------|

TRAINING SYSTEM FOR TECHNICAL PERSONNEL OF  
WATER SUPPLY AND SANITATION INSTITUTIONS IN  
CENTRAL AMERICA, PANAMA, AND THE  
DOMINICAN REPUBLIC

PROPOSAL FOR GTZ CONTRIBUTION  
1987-1989

## 3. CAPRE ANNUAL MEETINGS

Travel Expenses

|  |                      |
|--|----------------------|
| Agencies & Directors (3 x 15 roundtrip int'l. a US\$400) | US\$ 18,000<br>===== |
|--|----------------------|

Per Diem

|  |             |
|--|-------------|
| Agencies & Directors (3 x 15 x 3d a US\$110/d) | US\$ 14,850 |
| Secretarial Assistance, Printing, Imp. Sem.    | 4,500       |

SUBTOTAL:

|  |                      |
|--|----------------------|
|  | US\$ 19,350<br>===== |
|--|----------------------|

## 4. TRAINING MATERIAL, EQUIPMENT

|           |                      |
|-----------|----------------------|
| Imp. Sem. | US\$ 20,000<br>===== |
|-----------|----------------------|

## 5. TECHNICAL DOCUMENTATION, LITERATURE

|           |                      |
|-----------|----------------------|
| Imp. Sem. | US\$ 30,000<br>===== |
|-----------|----------------------|

US\$(425,500)

## 6. TEN PERCENT (10%) CONTINGENCIES

|  |                      |
|--|----------------------|
|  | US\$ 42,500<br>----- |
|--|----------------------|

GRAND TOTAL:

|  |                       |
|--|-----------------------|
|  | US\$ 468,000<br>===== |
|--|-----------------------|