

A COMBINED  
GOVERNMENT OF THE REPUBLIC OF NIGER  
AND  
UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT  
MID-TERM EVALUATION  
OF THE  
NIGER RURAL HEALTH IMPROVEMENT PROJECT

No. 683 - 0208

THE U.S. TEAM REPORT

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## CHAPTER 1.0 EXECUTIVE SUMMARY

### 1.1 Introduction

The AID-assisted Niger Rural Health Improvement Project (#683-0208) recently underwent a mid-term evaluation for purposes of which a five-person team was sent to Niger from the U.S. during the period March 10 through April 15, 1981. During this period, the U.S. team studied documents, examined files, visited training schools, conferred with responsible officials, and made a 4,500 kilometer overland field visit to 6 of the 7 Departments of Niger in the company of the Project Director, 3 officials of the Ministry of Public Health and Social Assistance, and a representative from the Ministry of Foreign Affairs.

This chapter is an executive summary for the busy reader and concentrates exclusively on conclusions and recommendations of the U.S. team. The interested reader is encouraged to read later chapters which will give background to conclusions presented in this chapter.

The team, as a group, after 13 days of arduous travel, had little less than a week to collect their thoughts, analyze what they had seen, heard, read, and experienced, and put pen to paper. For this reason, time did not permit fullness of discussion in the Findings and Analysis that the team would have preferred.

This chapter contains conclusions and actionable recommendations. Most relate directly or indirectly to the Rural Health Improvement Project but since this project has components which relate to many aspects of Niger's rural health system, to training, data systems, institutional development, management, logistics, construction, vehicle maintenance, and a host of other topics, recommendations are necessarily wide-ranging.

The format of this chapter consists of a presentation of each conclusion followed directly by an actionable recommendation. The sequence of topics follows the order found in the Findings and Analysis chapter (Chapter 5.0). To the extent possible, a concise statement of the finding leading to the conclusion is also included. Where this seems insufficient, the reader is advised to turn to the corresponding section in the Findings chapter for greater detail.

For purposes of brevity, conclusions and priority recommendations are given only in the Executive Summary. General observations and suggestions are found throughout the body of the text.

### 1.2 The Rural Health System

The rural health system in Niger is generally well designed, appropriate to the country's general situation, and provides a good foundation on which to gradually improve the quantity and quality of health

coverage for the nation. The team was impressed with the Ministry's yearly self-study of its health care system. During these five Journees d'Etudes de la Sante, several of which were funded by USAID, many problems and issues of critical importance have been identified and discussed over the past several years. Unfortunately, solutions to many of the problems identified are not easy nor can they be achieved quickly. Nonetheless, the breadth and scope of these meetings gave clear evidence of the country's determination to improve health care for the rural majority.

Niger's system is organized, has continuity, and reaches the underserved rural areas. The system is affordable and is supported at grass roots level as well as by political and social groups. It is a Nigerienne system, developed by Nigeriennes for Nigeriennes.

The system was seen by the U.S. team as developing and expanding as planned, and increased coverage of the rural population by Village Health Teams was largely on target. Construction of new dispensaries and facilities is proceeding, and, although there are a number of associated problems, it seems likely that the goal of health for all by the year 2000, as defined by WHO, may well be achieved in Niger.

The strengthening of dispensary level services to the point that these become the facilities where definitive preventive, promotive and curative services are made available to the rural population appears a wise decision.

Major constraints on the system are low levels of literacy and education of the population generally, but particularly in rural areas. Adequate financial and human resources presents another area of substantial challenge to the government.

The present health system provides a foundation on which to build a more comprehensive public sector health service as education, literacy, and resource availability increase.

The present life-of-project for the RHIP does not adequately take into account problems which must be overcome or incremental steps required for their solution. Public sector health system development takes time. The original RHIP project life was ambitious but unfortunately is unrealistically short.

Recommendation 1.21: The U.S. evaluation team unanimously and strongly recommends that RHIP project life be extended to December, 1984, irrespective of other recommendations of this report that may be implemented and irrespective of upward or downward financial adjustment made to any component of the project.

### 1.3 RHIP Organizational and Administrative Structure

Pursuant to recommendation 1.21 above, the team believes changes relating to project organization are of the highest priority if the RHIP

is to utilize inputs in a timely fashion and produce outputs desired both by the Ministry of Health (MOH) and the Agency for International Development (AID).

The language of the Project Grant Agreement concerning the administrative structure of the project is outlined in Article 5: Special Covenant, Section 5.1 Administrative Structure of the Project (see Appendix A), and is as follows:

- (a) The Government will select and appoint a senior-level Nigerienne civil servant as full-time Director of the Project. The Director, residing in Niamey, will supervise the implementation of the Project. The Director of the Project will be under the authority of the Minister of Public Health and Social Affairs. The latter will be in charge of implementation and have overall responsibility for the Project.
- (b) Outside of the funding provided by this Agreement, AID will designate a health specialist, who will reside in Niamey, to assist the AID Mission Director in the management of AID's contribution of goods and services to the Project and their use towards the attainment of the Project objectives described in Annex 1. This AID specialist will act as AID advisor to the Project Director and will serve as Liaison between AID and the Project Director's office.

After study of the project, the team noted that this project includes components which involve all 6 Divisions of the Ministry, ONPPC, and DDS-level structures.

It was also evident that the present administrative structure for the project within the MOH does not presently reflect the fact that this project supports components which necessitate contact with all Directorates and/or Divisions.

More specifically, the RHIP must be involved with DEESN where training is concerned, ONPPC where pharmaceuticals are concerned, DHMM where sanitation, hygiene, and immunization are concerned, DIS where health planning, statistics, and transport are concerned, DAS/PMI where the health of mothers and children is concerned, and DES where dispensaries, facilities, and VHTs are concerned. Given these actualities, it is clear that the RHIP is a supra-Divisional project.

Since construction is targetted for particular Departments, for DDS headquarters, and for dispensaries, and the Ministry of Public Works is also involved, it goes without saying that DAF is also intimately involved with fiscal matters related to the project.

The team believes that a major number of problems encountered to date arise out of organizational failure to recognize the supra-Divisional nature of the RHIP and failure to position it properly within the administrative structure of the Ministry.

A series of recommendations considered essential by the team follows from the above facts.

Recommendation 1.31: The evaluation team strongly and unanimously recommends that the Mission Director meet with the Minister at the earliest possible opportunity with the objective of negotiating agreement to establish an RHIP Project Office attached to the Office of the Secretary General which will then more accurately reflect its Ministry-wide nature.

Recommendation 1.32: Pursuant to the above recommendation, the team urges that the Secretary General be appointed RHIP Project Director.

Recommendation 1.33: Pursuant to Recommendation 1.32, it is recommended that the Mission Director negotiate agreement with the Minister on appointment of a full-time Nigerienne Project Manager to work under the direction of the Secretary General (Project Director) and relate to the RHIP Chief of Party.

Recommendation 1.34: It is strongly recommended that a U.S., French-speaking Chief of Party be recruited and hired by any means the Mission has at its command at the earliest opportunity, and that such individual serve in the RHIP project office outlined in Recommendations 1.31, 1.32 and 1.33.

The Chief of Party's working counterpart should be the Project Manager; his administrative counterparts would be the Project Director and the Project Manager.

Recommendation 1.35: All non-direct-hire expatriates supported by the RHIP, whether with Africare, contract, or any other mechanism, should report to and through the U.S. Chief of Party and the MOH Project Manager for the life of the project and be subject to such regulations, scope of work, and duties as the AID Mission and MOH shall jointly determine.

It is a disservice and unwise management to expect an AID Health Officer to simultaneously act as colleague, Project Manager, Project Officer, and enforcer of AID requirements within the Ministry. Neither of 2 RHIP Project Officers have been able to resolve major problems associated with the present counterproductive arrangement, nor is it likely that any future AID Health Officer would be able to do so. The contradictions in roles are insurmountable.

Recommendation 1.36: The team strongly recommends that the present Health Development Officer must be located in the PMSU building or at the Mission when Recommendations 1.31, 1.32, 1.33, 1.34 and 1.35 are implemented.

The team recognizes that recommendations made in Section 1.3 pose difficulties but are of one accord in believing that the project has no modest hopes of attaining project objectives unless such changes are made.

The RHIP U.S. Chief of Party must be carefully selected. He must be internationally experienced in public health, and it is essential that he be fluent in French. While it would be desirable that he also be a

physician, team members who have attempted to recruit physicians with these qualifications have found that there are few of them available. A physician, though Francophone, who is primarily a clinician, but not identified with public health, will compound rather than resolve problems. Clinically-oriented and public health-oriented physicians are two very different breeds of professionals.

The team's recommendation is that public health training, relevant international experience, and fluent Francophone capabilities be first-order priorities with respect to selection criteria.

Recommendation 1.37: It is recommended that the Mission Director negotiate an agreement with the Minister for formal, regular, quarterly meetings between the Project Director, Health Development Officer, Mission Comptroller, and additional GON or AID staff, as needed to review project progress, outstanding problems, fiscal and financial matters, and unresolved issues. An agenda should be set for each meeting and it is essential that minutes and actual decisions from these meetings be made part of the project record. The evaluation team urgently recommends that this recommendation be put into effect as quickly as is organizationally possible.

The present Project Director prefers, and is most comfortable with, formal meetings. Because of his schedule, informal meetings are difficult to arrange. There are many unresolved issues which must be addressed at the earliest possible opportunity; these issues are best resolved by a formal dialogue beginning as soon as possible. Informal dialogue has little prospect of leading to a solution.

The team believes that the personal presence of the AID Comptroller at quarterly RHIP meetings indicated in Recommendation 1.37 would do much to keep RHIP financially on track. Until major financial problems have been satisfactorily resolved, the team suggests his personal presence will be required since his authority is needed to decide where exceptions and arrangements are permissible.

We reiterate that any decisions made must become a matter of record. There is no paper available to indicate decisions of the former Comptroller or of the former Health Officer to form a basis for present action to resolve outstanding financial issues. The team feels that, if financial problems with respect to payment continue, there will develop an adversary climate between the Mission and the MOH which will erode collaboration needed on a great variety of project-related substantive matters.

There are presently a number of outstanding financial issues concerning receipts and acceptable record-keeping which require the authority of the Mission Comptroller to resolve. The Project Director agreed in a meeting at DDS headquarters in Tahoua to meet directly with the Comptroller to resolve a series of outstanding financial problems. The Health Development officer has neither knowledge, authority, or direct familiarity with permissible solutions to these problems.

Recommendation 1.38: It is strongly recommended that the Mission Director convene a meeting between the Project Director, AID Mission Comptroller, and such other GON financial officers as may be necessary to resolve problems surrounding payments for earlier receipts (prior to 1980). It is further recommended that the Health Development Officer serve as rapporteur at this meeting to produce minutes recording required steps and that these decisions be ratified by the Comptroller and the Project Director or one GON official responsible for such matters.

Africare, which prior to March 31, 1981, operated under a separate project, became part of, and is funded by, the RHIP as of April 1, 1981. All technical assistance provided from April 1st forward must relate to the larger goals and objectives of the RHIP. Terms of reference of all technical assistance personnel should be reexamined and redefined in consonance with and with relevance to the RHIP.

Recommendation 1.39: All contracts, documents, agreements, terms of reference, duties, and responsibilities of all Africare personnel should now be re-examined and amended by the Mission. Scopes of work, reporting relationships, and duties under the RHIP should be clearly and explicitly stated and formally revised during the forthcoming RHIP project revision which follows in sequence from this evaluation and Mission's review of it.

Arising from Recommendation 1.39 and directly pursuant to Recommendations 1.33, 1.34, and 1.35 the team strongly advises the following course of action:

Recommendation 1.40: It is recommended that the Africare public health physician be immediately appointed as Acting Chief of Party until such time as recommendations in Section 1.3 have been considered and/or implemented. The Acting Chief of Party is to relate to the Project Director and AID Health Development Officer, and to the RHIP Project Manager, when appointed. All Africare and other project expatriate non-AID personnel are to be coordinated by the Chief of Party irrespective of the mechanism by which they are employed. The Chief of Party is to work closely with the Health Development Officer on all RHIP-related matters.

#### 1.4 Health Services

While mindful of severe resource constraints, the U.S. team found significant gaps in the present scope of rural health services in Niger. These will be commented upon in the body of this report.

Due to time constraints, not all health services and health problems could be evaluated with respect to appropriateness of management in Niger. Conclusions which follow deal with high priority problems and specific situations where meaningful improvements are feasible.

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## Malaria

Malaria in Niger is handled better than in many hyperendemic malarian countries. Suppressants and curative medications are readily available. At the village level (those with VHTs), secouristes are treating fevers with chloroquine. A basic question is whether the routine use of malaria suppressants should be Ministry policy for VHTs.

Natural resistance and partial immunity to malaria develop over time in those who have repeated attacks. For this reason, many authorities feel that suppressants should not be used routinely with rural, sedentary populations, although all agree that attacks should be treated promptly and vigorously. The possibility of chloroquine-resistant strains of plasmodia developing where large populations are taking chloroquine prophylactically must be a constant concern.

The situation in Thailand may be instructive in this regard. When chloroquine resistance developed in Thailand, it became necessary to switch to a pyrimethamine-sulfanilamide combination known as Fansidar; this was widely used as a malaria suppressant for several years. This year (1981), a Fansidar-resistant strain of falciparum malaria has developed. Thailand is now seeking an affordable alternative to chloroquine and Fansidar. Similar problems could develop in Niger.

While the team does not advocate specific policy modifications at this time, the recommendation which follows is made in the interest of preventing development of the Thailand situation.

Recommendation 1.41: It is recommended that the MOH study and review its present policy on routine use of chloroquine as a malaria suppressant for rural populations served by VHTs and seek expert guidance from a WHO or an international short-term malaria consultant.

## Measles

Measles and other vaccine-preventable diseases are not handled as well as they could be in Niger. Mobile vaccination teams do not reach target populations with anywhere near the required frequency. There are serious problems with Ped-O-Jet injections and possibly with the potency of some vaccines used (measles, for example). Immunization of pregnant women against tetanus is particularly insufficient.

In place of the Grandes Endemies approach of the DHMM, the population would be better served through development of an expanded program for immunization (EPI), based primarily at the dispensary level. Mobile teams would still be used to reach nomads who cannot be served in fixed facilities. Until EPI can be implemented, mobile teams should continue to immunize, but with properly functioning equipment.

To provide immunization from fixed facilities will require additional equipment, namely refrigerators, syringes, needles, and addi-

tional staff. While these requirements cannot be mobilized at once, they could be made available over time. Retraining of certified nurses and other staff will also be required.

Implementations of EPI, patterned after the WHO model, will require shifts in responsibilities within the Ministry and this would need attention. Training for EPI is available from WHO, and possibly through CCCD at no cost to the country when this program becomes operational later this year.

WHO is actively promoting EPI and most countries are following the WHO program. The U.S. and five other donors - France, Belgium, Canada, the Federal Republic of Germany, and the United Kingdom - have recently formed a funding organization called Concerted Action for the Development of Africa (CADA) and will soon commence a major effort aimed at combatting childhood communicable disease (CCCD) in sub-Saharan Africa. The U.S. is the lead donor in the CADA-backed CCCD program.

Either alone or in concert with other CADA members, it would be timely for the GON to explore the possibility of support for EPI and diarrheal disease control programs (discussed below) in Niger. Alternatively, appropriate preparations for these activities should be supported by RHIP.

The team is aware that the GON/MOH had requested AID to provide the services of a cold chain logistics expert from the CDC early in the project. The team learned that the CDC responded by saying that they would supply such a person only upon receipt of an EPI plan. The evaluation team, having seen that there is much room for improvement in Niger's immunization activities, believes there is a continuing need for an individual capable of working with the MOH to develop an EPI plan, followed by assistance with the cold chain and logistical aspects of this problem. While Niger has a good basic health delivery system, its immunization program is operating ineffectively.

Recommendation 1.42: Due to present poor conditions of Ped-O-Jets observed in use, we estimate that only 10% of all vaccines administered with Ped-O-Jets are adequate dosages. Therefore, the team recommends that, until the condition of the present Ped-O-Jets is significantly improved, the MOH should immediately desist from using this method of administering vaccines.

Recommendation 1.43: It is recommended that a Ped-O-Jet specialist be financed under the RHIP for three months to inventory all spare parts and prepare an appropriate spare parts list, including need for additional Ped-O-Jets.

Recommendation 1.44: It is recommended that a systematic retraining program on the proper use and maintenance of Ped-O-Jets be initiated and supported under the SHDS program or through the RHIP.

Recommendation 1.45: It is recommended that the Minister of Health appoint a senior-level Ministry-wide commission to examine, review, and evaluate the entire scope of immunization activities presently

supported by the Ministry and report back to him no later than January, 1982, with recommendations. It is recommended that he seek the services of a respected and knowledgeable Francophone West African advisor (not from the MOH) to assist him in reviewing the findings of the commission prior to implementation.

In view of the fact that the GON and its WHO representative have agreed to review EPI in July, 1981, the earlier view held by the MOH that an advisor is needed in EPI planning, cold chain, and immunization logistics will be strengthened. The team shares the view of the Ministry that assistance in this area would be useful and valuable.

Recommendation 1.46: Either simultaneously with the work of, or following the report of, the commission (Rec. 1.45), it is recommended that the MOH request from the RHIP, WHO, or an acceptable donor, the services of an international expert to work with the MOH to prepare an EPI plan, followed by assistance with cold chain, logistics, and immunization programming for a period of not less than 2 years.

#### Diarrheal Diseases

About one of every 10 children born in developing countries dies of diarrhea before reaching the age of five. In Niger, diarrhea causes thousands of deaths each year and fills more than one-third of children's beds in hospitals. It causes malnutrition since children with diarrhea often have food withheld or have diminished appetites; food lost in the stools is not adequately replaced.

Malnutrition also makes children more susceptible to diarrhea and this creates a vicious killing cycle. There is synergism between malnutrition and infection. Most diarrhea in Niger can be treated, preventing associated malnutrition and death, by giving the sick child an oral rehydration solution made from clean water and the right amounts and balance of salts and sugars and feeding this to the child as soon as is possible.

Recommendation 1.47: The evaluation team strongly and unanimously recommends that Niger adopt the diarrheal disease control program designed by WHO and that preparation for this activity be included in RHIP project revision.

This program includes management training for senior-level health officials (a 2-week course), and a similar course for middle-level Ministry staff with operating responsibility for supervising delivery of services (e.g., DDS staff and PMI level). In-country training of CM, dispensary, and village health staff would eventually be required.

Oral rehydration salts may be obtained through UNICEF or alternatively could be prepared by ONPPC. The latter may be preferable since the packaging could be more culturally appropriate. The evaluation team understands that ONPPC is discussing possible production of ORS packets with the Belgian external assistance group.

Three strategies are recommended to better control diarrheal disease in Niger.

1) Management of acute diarrhea by prevention and treatment of dehydration

Cases of acute diarrhea from any cause in all age groups can be treated with a simple oral rehydration solution (ORS) containing sodium chloride (3.5 g), sodium bicarbonate (2.5 g), potassium chloride (1.5 g), and either 20 grams of dextrose or 40 grams of sucrose (table sugar) in one liter of potable water. Oral administration of this mixture replaces fluid and maintains hydration even in cases of severe diarrhea; it is also useful in many cases of vomiting.

2) Maternal and Child Care Practices

Recommended practices to reduce diarrhea-related mortality and morbidity are:

- breastfeeding, uninterrupted during the first 2 years of life
- proper weaning practices: starting from 4th to 6th month, locally available weaning foods, such as peanut paste in Niger, should be added to supplement breastfeeding
- care for pregnant and lactating mothers, including adequate food and a decreased work load
- good personal and food hygiene
- appropriate health education concerning care and feeding of small infants and children

3) Improvement of water supply, sanitation, and food hygiene

Oral rehydration therapy (ORT) is usually given in the home by mothers. In Dosso Department, the beginnings of ORT have been started but these need strengthening with the complete use of ORT rather than "a pinch of salt and a pinch of sugar." ORT should be used in dispensaries and other facilities.

Antibiotics and other medications, including enteric sulfonamides, are now in use in Niger, but throughout the world, have been proven to be of limited value in the treatment of diarrhea, except for cholera or severe shigella. The use of antibiotics is generally not advised since they divert health workers from more important tasks of rehydration and dietary management.

Sterilization of Needles and Syringes

The present system for removing sterilized needles and syringes in CMs and dispensaries results in contamination; there are several alternatives. A special forceps container assembly is available for use with cold sterilizing solution. The assembly consists of a stainless steel tube and base into which the forceps hang. A cover is attached to the forceps to prevent the loss of sterilizing fluid in the tube to evapora-

tion. Alternatively, a different type of tray for boiling items could be used, one which is specially constructed so that the forceps cannot fall into the water bath inadvertently.

Recommendation 1.48: It is recommended that the present system for sterilizing syringes and needles be modified to reduce infection and abscesses at injection sites. The RHIP is encouraged to review and purchase appropriate sterilizing equipment for the 7 USAID-supported dispensaries, at minimum, and more widely, if possible.

## 1.5 Rural Water Supply

Although the GON is moving forward with the OFEDES reinforced-concrete well program, the installation of these open wells cannot provide a safe, protected water source for rural populations. Adoption of the lifting device used in irrigated gardens near Agadez offers a low-cost, easily adaptable means to improve the sanitation of OFEDES wells. This was observed to be an appropriate technique already in use in the country and worth disseminating to other parts of Niger with slight modification.

Recommendation 1.51: It is recommended that one of the USAID-financed sanitary engineers assigned to the GON be assigned the task, and provided with sufficient funds for, investigating adoption of the low-cost water-lifting system for irrigated gardens presently in use near Agadez for fitting to OFEDES reinforced concrete wells.

Initial RHIP funding of \$75,000 is recommended for local fabrication of parts and installation of the lifting system. Materials already available should be used to the maximum extent possible to permit ease of maintenance by local populations and reduction of unit costs.

A real and immediate need exists for study of experience to date in Niger using manual pumps with the final goal of standardizing for the country a manual pump which can be manufactured in Niger.

Recommendation 1.52: A study should be undertaken to look into the feasibility of introducing a standard hand and/or foot pump for Niger which could be manufactured locally (Rec. 1.51). The study, involving the USAID-supported and supplied sanitary engineer assigned to RHIP, should be assisted by a short-term consultant (3 months) expert in hand pump technology. Additional funds amounting to \$500,000 should be made available to RHIP for this activity.

Study objectives should be as follows:

- 1) review of experience in Niger and other Sahelian countries with use of manual pumps in order to identify constraints and problems in their use.
- 2) investigation of the capacity of local industries to manufacture manual pumps and spare parts.
- 3) to adopt and redesign existing manual pump technology for application in Niger as needed.

- 4) to design and execute a small pilot local manufacturing installation and testing activity for the manual pumps selected.
- 5) to identify other water supply and sanitation items which may be locally manufactured.
- 6) to develop a strategy for dissemination of manual hand pumps for installation of new or existing wells and bore-holes as appropriate. Additional funding should come either from RHIP, a new USAID-financed project, or with resources available to the GON.
- 7) to provide a competency-based training program to GON personnel and local consumers in all components of the project.

The water filter program of the RHIP has not met with success to date, mainly due to fragile components and lack of maintenance. It was found that those placed in areas of public use appeared most susceptible to early failure.

Recommendation 1.53: Filters installed in the Department of Niamey which have not been used or which have not been satisfactory due to repair and maintenance problems should be returned to the National Hygiene and Sanitation Service for repair and reassignment. Assignments should be limited to dispensaries, schools, and CMS where supervision in their use and maintenance may be provided. Distribution should not be confined to Niamey Department.

Sanitary engineers (Africare) should make random sample checks to determine use, maintenance, problems with these filters at least once every 2 months. As Sanitary Agents are graduated from ENICAS and assigned to Department and arrondissement levels, the filter inspection and maintenance function should gradually be transferred to them.

Recommendation 1.54: At least 4 existing filters should be assigned to ENICAS as training aids and for use in pilot studies to determine the best filter media and proper maintenance cycles. Capabilities and limitations of the filters should be studied.

Design faults should be analyzed at ENICAS and modifications adopted and tested to eliminate causes of component failures.

In addition, students at ENICAS should be provided with simple HACH water-testing kits in order to evaluate the efficiency of the filters during the pilot studies. This type of examination should become a standard element of the curriculum for Sanitary Agents.

Recommendation 1.55: At least 40 HACH water-testing kits and spare reagents should be provided by the RHIP to ENICAS. Proper use of these kits should be involved in the curriculum. A new kit should be given to each Sanitary Agent for use in his work after graduation.

The estimated cost of this recommendation is \$8,000.

Dispensary water supplies were either absent or behind schedule at USAID-funded dispensaries observed. A number of problems were observed and have been elaborated on elsewhere in this report.

Recommendation 1.56: With regard to the water supplies for the dispensaries being constructed by the GON with RHIP funding, OFEDES should be requested at the earliest possible opportunity and on a priority basis to drill a bore-hole within the courtyard of each dispensary in lieu of the presently planned concrete reinforced wells. Where practical, the well should be equipped with a hand or foot pump positioned to lift the water to the overhead reservoir. Where not feasible, an electric pump should be installed. Power should be provided by small portable 4-stroke gasoline 2 or 3 kw. generators located in the living area of the dispensary. All funding for this recommendation, except for the drilling and preparation of the bore-hole, should be a U.S. contribution to RHIP, estimated at \$2,000 maximum cost per dispensary or a total of \$14,000.

It was clear that there were a number of issues relating to water policy which could not be touched upon in the limited time available to the evaluation team. Particularly regarding safe, potable drinking water, there is much to be done.

Recommendation 1.57: The RHIP should provide four (4) man-months of consultant services to the GON to identify needs and prepare a study leading to formulation of a national water policy, activities which may be considered for USAID funding.

As projects are contemplated, planned, and executed, large reservoirs to serve as irrigation and water supply sources will be created. The dam at Tera is already complete. As many ponds and natural lakes (e.g., at Tabalak) currently in use are reported to have high schistosomiasis infection rates, an increase in schistosomiasis cases in Niger is almost a certainty, adding to the already considerable public health burden. The experience of Egypt is relevant to this problem.

Recommendation 1.58: It is recommended that RHIP fund a short-term study to review the current extent of infection, assess the impact of future projects on health and the environment, and determine measures to mitigate problems caused by increases in population at risk for schistosomiasis.

AID/Washington has one of the world's experts, Dr. Alfred Buck, formerly Professor of Infectious Disease at Johns Hopkins; and for some years with WHO/Geneva. Dr. Buck has recently returned from the People's Republic of China where he consulted on this problem. Mission funding of Dr. Buck's services with RHIP funding would be a low-cost method of acting on this recommendation since Dr. Buck's salary is paid by the Development Support Bureau of AID.

Dispensaries being constructed through USAID funding are currently wasting funds being spent on plumbing and the water-borne sewage system. It is recommended that the USAID Mission Engineer consult by telephone or mail with the U.S. evaluation team engineer for further discussion of this problem. Time did not permit extended discussion on this issue.

Although outside the immediate scope of the RHIP evaluation, it is the team's suggestion that an evaluation into the agricultural and water

supply potential of establishing a small dam program for the country would be useful. Such a program would have as its aim the establishment of inexpensive, rapidly constructed small dams (wadis) to catch and prevent the rapid surface runoff during the rainy season. Wadis would provide reservoirs of water for a short period into the dry season, permit recession farming, and improve replenishment of the groundwater table. A similar project was recently formulated by USAID in Mauritania. Benefits in terms of supplies of drinking water would be indirect but substantial.

## 1.6 Sanitation

The main thrust of any environmental sanitation program for the rural level in Niger should be centered on education in basic sanitation (personal hygiene, refuse burning pits, burying of human excreta in the fields, maintenance of wells and surrounding area, penning of livestock and fowl, disposal of animal excreta, etc.) through the VHTs, public schools, media, and religious organizations.

Recommendation 1.61: The resident Africare Sanitary Engineer should undertake a study into problems of environmental sanitation in rural villages. This study should be assisted by short-term consultants in epidemiology (2 person-months) and sociology/ anthropology (2 person-months). Attention should be given to the problem of acceptance by rural populations of sanitary measures. Methods to be used to insure acceptance and maintenance of sanitary improvements by rural populations should receive sufficient as well as explicit attention in this study.

The training program for Sanitary Agents at ENICAS seems adopted to the requirements of the country and meets the goals of the RHIP. A need exists to expand present project scope and funding to accommodate the new 2-year training program and continue to train Sanitary Agents for the period which embraces extension of the project.

Recommendation 1.62: It is recommended that funds in the RHIP be increased to support 30 Sanitary Agents enrolled at ENICAS for the extended life of the project. This will permit enrollement of 15 new students per year for the 2-year training course. An extension of training support through June, 1985, is necessary to attain the present training output objective of 75 Sanitary Agents assuming that Recommendation 1.22 is favorably acted upon.

Not only is it important that Sanitary Agents graduate in sufficient numbers, but also that they have an input into rural health services.

Secouristes and matrones are now the most numerous health agents in the country. It is important that their training be effective. The number of hours in the current training curriculum for VHTs involving environmental sanitation appears to be sufficient. Detailed materials or training techniques were not examined, but from verbal descriptions by faculty, insufficient emphasis on the use of competency-based training

techniques or with experiential learning seemed the case. The present short training period sets limits on what is possible.

Recommendation 1.63: It is recommended that the Africare Sanitary Engineer (Zinder) be given responsibility to review and modify initial and recurrent training given the VHTs in environmental sanitation to better adapt the curriculum to actual needs. Attention to means of human excreta disposal in villages should become a focal point of this review.

Since training of VHTs is done at CM and dispensary levels, inputs of Sanitary Agents into the training of VHT's can be of potentially great benefit.

Recommendation 1.64: It is recommended that newly trained Sanitary Agents have an active role in initial and recurrent training programs for VHTs.

The ability of the RHIP-funded Sanitary Agents to properly supervise VHTs and assist in rural projects will also be limited by lack of transportation.

Recommendation 1.65: The team recommends that the necessary funds be made available for purchase of an additional 100 Mobyettes for Sanitary Agents assigned to arrondissement and dispensary levels who will be responsible for supervision of sanitation activities at VHT and rural village level. Initially, 50 Mobyettes should be provided with a replacement cycle of 50 Mobyettes at the end of RHIP project life. Cost = 100 x \$1,665 = \$166,500.

The third-country training program for Sanitary Technicians was seen as sufficient to meet the goals of the project. Confusion over curriculum for individual training in Dakar must be resolved. The total number of Sanitary Technicians planned for efficient operation of the NSHS will not be sufficient.

The training program for the Sanitary Engineers seems sufficient to meet the goals of the project. Nonetheless, an insufficient number of engineers are being trained to meet the needs of the NSHS.

Future evolution of both VHT and public awareness of environmental sanitation needs will place demands upon securistes which will conflict with their primary duties in curative treatment of the sick. This will lead to a need for an additional member to the VHT to handle environmental sanitation matters and serve as a hygieniste. Planning for training and integration of this additional member to the team should start now.

Recommendation 1.66: The team urges the GON through the Africare Sanitary Engineers to commence the planning process for eventual conversion of some securistes to hygienistes and to plan for inclusion of a hygieniste in the current VHT within the next 8 to 10 years.



Although the GON has created an NSHS, this agency is currently understaffed and has yet to establish a clear role for itself by defining objectives, developing comprehensive plans, and determining present and future manpower requirements.

Recommendation 1.67: A special study should be undertaken by the RHIP into the role, objectives, planning, and personnel requirements of the NSHS. This study should involve the consultant services of a Sanitary Engineer (3 person-months), an organizational and management expert (2 person-months) and a financial analyst (2 person-months) and should utilize the Africare Sanitary Engineers as part of the study.

Assignment of technical assistance staff by Africare to the RHIP has not been satisfactory. Although the 2 Sanitary Engineers are currently on site, the inability of Africare to respond in a timely fashion to requirements of their contracts has caused costly delays in the execution of the project.

Recommendation 1.68: Africare Sanitary Engineers must be required to submit a report to the Chief of Party, Project Manager, and an information copy to the AID Health Development Officer (HDO) on their planned activities over the next 12 months. Monthly reports should be submitted to the MOH and the AID HDO indicating activities accomplished during the previous month, expected activities for the coming month, problem areas, and any constraints and modifications affecting their 12-month programs.

It was pointed out in this the budget report that the AID funded sewage holding vaults in dispensaries require modification if they are to have a useful life. There are several design problems inherent in them.

Recommendation 1.69: It is recommended that the Africare Sanitary Engineer study the feasibility of converting sewage holding vaults now constructed at each dispensary into aquaprivies. An estimated funding of \$15,000 should be reallocated and included in the project budget, in the event that soil conditions and the availability of an adequate water supply renders such a conversion feasible.

Due to misconceptions as to the qualifications and capabilities of the sanitary engineers assigned to the RHIP for technical assistance, their role as advisors to the GON has been limited to date.

Recommendation 1.691: The terms of reference given in Appendix K for the Africare sanitary engineers assigned to the GON as technical assistance personnel should be included in the revised Africare contract. It is recommended that a penalty clause be included in the Africare contract to preclude exorbitant delays in any future provision or replacement of staff to the project.

There is an essential need for the activities recommended elsewhere in this chapter to be carried through to completion by the end of the project.

Recommendation 1.692: Sufficient funds should be made available to the technical assistance component of the RHIP to allow extension of the Africare Sanitary Engineers to the end of the project.

The ability of the Africare Sanitary Engineers to perform their mission is limited by a lack of transportation.

Recommendation 1.693: It is recommended that the funds necessary for the purchase of 2 all-terrain vehicles be added to the project budget. These vehicles should be assigned to the Africare Sanitary Engineers to provide the transportation necessary to perform their duties. Cost = \$48,000. These vehicles will not be replaced at the end of the project.

French language competency is essential in carrying out RHIP project functions. Only one of the Africare sanitary engineers had sufficient fluency for these purposes.

Recommendation 1.694: Either the Sanitary Engineer in Zinder be re-assigned to Niamey with instruction in French language becoming part of his duties until he has sufficient fluency to perform duties recommended in other parts of this chapter, or support should be given him to study French in Zinder. The first option is seen as the preferred alternative.

Development of educational materials by the project has neither been significant nor sufficient enough to permit distribution of such information to rural populations through the health centers, dispensaries, and VHTs.

Recommendation 1.695: It is recommended that the Africare Sanitary Engineer actively endeavor to develop educational materials on basic sanitation for use in the VHT training program and for distribution to public schools, media, rural populations, etc.

Where RHIP funds have been spent for water filters and latrines, those efforts have not met with success, mainly due to poor planning and management and placement.

Recommendation 1.696: It is recommended that installation of water filters be limited to medical facilities in accordance with the RHIP agreement.

## 1.7 Health Data Systems, Service Records, and Reporting

A series of conclusions regarding surveillance, service records, and reporting were drawn by the team and follow in paragraphs below.

Although the MOH data system is very incomplete, there are sufficient data from which to establish major health problem priorities. This has been done by the Ministry. The main deficiencies lie in the ability to monitor effects of health-related interventions.

Cultural mores, low levels of literacy, and social factors affect reporting of deaths and make accurate data collection difficult. Less than 10% of rural deaths and 20% of urban deaths are said to be reported and recorded.

The team found no good baseline data on which to evaluate the rural health system.

Causes of death are not well-specified, even for principal causes such as malaria, diarrhea with dehydration, and communicable diseases such as measles.

The extent of malnutrition is not well quantified.

There are no reliable indicators available to measure impact of the rural health system on decreasing morbidity and mortality, e.g., reduction in infant mortality, changes in crude death rate, etc., or on specific diseases. In 1976, WHO estimated that a child born in Niger in 1976 had an estimated life expectancy of 39 years; by 1980, that life expectancy had been raised to 42 years. The source of data on which these estimates were made is not known, but, if the estimates are based on similar experience or data they indicate improving health (and probably socio-economic) status.

Despite hard data, knowledgeable Nigerienne health officials, e.g., DDSs, report a decline in malaria and maternal mortality in villages with VHTs. The evaluation team has no reason to doubt this is true.

In the past 4 years, the quantity and quality of health data have improved and continue to do so. Epidemiologic surveillance of significant reportable diseases is now good and epidemics of life-threatening diseases are quickly reported. This has been made possible by a well-developed communication system, both line and microwave, which is outstanding compared with those of many other African countries with greater resources.

Several kinds of assistance are recommended to bolster the health data system as it relates to this project, both to monitor project progress and for project management.

Recommendation 1.71: At least one Nigerienne, preferably a physician, should be trained abroad in health statistics and biostatistics. The individual ultimately should be made responsible for data components of the RHIP.

Recommendation 1.72: At least 3, but preferably 6, Nigeriennes should be trained as "health statistics agents." WHO offers courses of 3-6 months for such individuals, and other institutions have similar programs. AT THE CDC, THERE IS A 3-WEEK INTRODUCTORY COURSE IN FRENCH, IN THE USA.

The health statistic agents would be posted at Departmental level, preferably one per Department, except in Niamey where a Ministry functionary (see Section 1.51) would provide health data back-up for

RHIP. Those selected to be trained for this job should be, at a minimum certified nurses and preferably should have completed high school. These individuals would work with Departmental staff and expatriate specialists described below.

At the Ministry level, as long as there is an MD epidemiologist/statistician in the Health Statistics Section, posting of an expatriate physician is not advised. The needs expressed by the team and concurred with by the physician member of the team are for an individual with data-processing experience who can adopt small computer technology to facilitate handling of project-related and other statistical data, but whose basic skills are in health data analysis. This individual would be provided through AID-supported technical assistance. Qualifications would include at least a Master's degree in biostatistics, French language competence, and practical experience in specifying, processing, and using data in health projects in less developed countries. This person would be posted in Niamey for 2 years.

Recommendation 1.73: It is recommended that RHIP supply the MOH with a microcomputer and packaged statistical software for the position indicated in Recommendation 1.71.

Recommendation 1.74: Three health data specialists, persons trained at the Master's degree level, should be provided by RHIP technical assistance and be posted to Niger for one year. They must be French-speaking. Each is to work at Departmental level, serving 2 or 3 Departments. Their function would be to train and supervise counterparts, particularly statistics agents described above (see Rec. 1.72).

These expatriates would assist in improvement of the project data system at Departmental level. Ideally, these individuals should not be posted until adequately trained and oriented Nigerienne counterparts have been identified and hired.

In the absence of infant mortality rates and other measures of health status, other indicators of the effectiveness of the rural health system should be instituted. For example, villages could be required to record and report all deaths by age or age group, not being held to specifying the causes of death or identification of the deceased.

Recommendation 1.75: A longitudinal sample survey of approximately 20 villages with and 20 villages without Village Health Teams, randomly selected, should be undertaken as soon as feasible to collect baseline information making possible more accurate information on changing patterns of deaths under 5 years.

Causes of deaths would be reported in 4 categories; - those due to fever and/or convulsions (malaria), those from respiratory infections (measles), those from dehydration (diarrhea), and those from other causes. This would begin to get at chief causes of under-5 deaths and would be valuable in generating indicators which would measure, in effect, RHIP and MOH activities. Since it is estimated that between 50-60% of those born in Niger presently do not live to age five, concentration

on this age group is important. Other proxies for health status determination should be developed and incorporated into the RHIP.

## 1.8 Institutional Development and Logistic Support

### 1.81 Construction and Renovation

The construction program for 7 dispensaries and 2 Departmental centers risks becoming a failure through faulty construction of buildings and foundations and badly conceived water supply and sanitation systems. Arrangements between the GON and AID for approval and inspection are insufficient to meet AID accountability requirements.

Recommendation 1.81: A formal approval and inspection system should be developed immediately between the MOH, the Ministry of Public Works, and the AID Mission for all construction supported by the project.

The Mission Engineering Officer clearly needs more direct involvement with the RHIP construction program if the Mission is to meet its quality control and accountability responsibilities.

Recommendation 1.82: Participation of the AID Mission Engineer is essential. Terms of reference should be modified so as to include his participation, singly or jointly, in visits to all construction sites at predetermined key stages to advise GON inspection staff and USAID of his findings. It is further recommended that a report be prepared following each visit and that these observations be made part of the RHIP project files, both in AID and also officially transmitted to the GON offices with cognizance and responsibility for this project component.

Inasmuch as the team engineer observed faulty construction techniques, and unacceptably low and dangerously defective cement, it is incumbent on those responsible in the MOH, the Ministry of Public Works, at the level of the Prefect, in the DDS, and in USAID to move quickly on this matter.

Recommendation 1.83: It is strongly and unanimously recommended that the Mission Engineer take direct responsibility, at the earliest possible opportunity, to bring together a joint GON/AID team to make a detailed inspection of construction already completed by exposing at random points the foundations, structural beams and columns, floor slabs, and masonry. AID's participation should include the Mission General Engineering Officer and an Africare Sanitary Engineer.

The view of the team is that building inspection falls under the authority of the Mission Engineering Officer and he, rather than the Health Development Officer, should take the lead role in this matter, reporting his findings and recommended course of action to the Health

Development Officer and the Mission Director. Since the Health Development Officer accompanied the evaluation team to the sites; there is little point in his revisiting these locations.

### 1.82 Sanitary Improvements

Funds allocated for sanitary improvements to existing medical units through the country are not sufficient to make significant impact on these facilities. Expenditure of funds to date has been concentrated in the Department of Niamey on an ad hoc basis without regard to priorities or needs for equitable distribution throughout Niger.

Recommendations 1.84: The Africare Engineers, in consultation with the GON, should begin making an inventory of the sanitary needs of existing health centers and dispensaries in order to determine the nature of the require improvements, priorities, and estimated costs per medical unit. Minor repairs to the buildings as well as interior and exterior painting should be a required GON contribution to this effort.

The team, after rapidly reviewing construction and renovation costs in Niger, is aware that RHIP-budgeted amounts for renovation and improvements are insufficient.

Recommendation 1.85: Funds available in the RHIP budget for sanitary improvements to the medical units should be increased in order to better respond to the actual costs of construction in Niger. A joint GON/AID inspection system should be established to insure adequate control on the quality of work by contractors undertaking these improvements.

### 1.83 Resupply and Transport

In regard resupply, the danger is that if expansion of the VHT network increases at a rate faster than that of supervisory staff, major resupply problems will result. In areas where distance and terrain (sand) preclude frequent supervisory visits, alternative means of transportation should be explored on a pilot basis. Properly equipped 4-wheel drive vehicles can visit all villages; however, these are not available at dispensary level. Mobyettes are capable of traversing the terrain to reach 40-60% of villages with VHTs. Camels or horses must be used to reach the others.

Recommendation 1.86: It is recommended that the RHIP, through the Project Support Unit of the Mission, request product specification sheets and brochures from the manufacturers of motorized all-terrain 3-wheel vehicles and seriously consider their utility for the project.

The tires of these small, lightweight vehicles (the size of a Mobyette) are 10-12 inches wide and perhaps 18 inches in diameter. It is

believed that both Honda and Kawasaki manufacture them. It is not known whether or not there are American manufacturers of this type of vehicle. Assuming specifications indicate this vehicle may be used in the Sahel, the RHIP should consider the purchase of 10 for pilot testing. The Afri-care mechanic in Tahoua, Mr. Jon Newman, has expressed an interest in playing a role in overseeing such a pilot test. If field tests are successful and these vehicles are provided to dispensaries located in remote sandy regions of the country, they will have an effect of reducing the travel time for supervisory visits from as much as 2 days per visit on horseback to one half-day trip, thereby saving great amounts of time and increasing the frequency of supervisory visits. Faced with a half day as opposed to a grueling 2-day horseback ride, far more supervisory visits would take place.

#### 1.84 Medical Kits

The evaluation team observed only minor problems with broken wooden medical cases. However, the cases are fairly heavy.

Recommendation 1.87: A light durable case similar to those issued to matrones should be issued to securistes; UNICEF should be consulted.

Such a case would need to be 2-3 times larger than that of matrones to accommodate the securiste's medication. Alternatively, issuing 2 matrone-type cases might be preferable - one for pills and the ledger and the other for liquids and bandages. Carrying 2 such small cases (one in each hand) to satellite villages or encampments would be more portable and certainly more durable. If it is preferable to carry the large case on one's head, the idea of 2 cases should be abandoned.

Another minor problem exists with the type of vials used for liquids. Some breakage and spilling of medications was reported to the evaluation team.

Recommendation 1.88: Non-breakable polyethylene screw-cap vials present an easy, simple solution to this problem. ONPPC should procure them. No budget change is required for this recommendation.

Wound management is an important part of the securiste's responsibilities. Most physicians recommend thorough cleansing of wounds prior to application of mercurochrome.

Recommendation 1.89: The simple addition of a bar of lye-based disinfectant soap should be considered as part of the securiste's and matrones' kits, added to them initially, and also through resupply.

Some matrones had soap in their kits; most did not. The issuing of soap for wound management might be subject to personal misuse. However, if it encourages personal hygiene, that might not be entirely bad. Matrones' kits are not supplied with high-usage items, and, as such, they are less subject to the same logistics and resupply problems. The cases

themselves are made of lightweight, durable aluminum alloy and are supplied by UNICEF. Not one single UNICEF case was damaged or broken. Some were cleaner and more neatly kept than others.

Recommendation 1.90: Supervisors should include cleanliness of matrones' kits as an item for observation and discussion during supervisory visits. The presence of a bar of soap in each kit is recommended and should become an item subject to resupply. Once again, this recommendation can be accommodated within the existing budget.

## 1.9 Manpower Development

To date, of the 3000 securistes to be trained under the project, 1235 or 41% of the total have been trained and 926 or 31% of project supported matrones have been trained. If the 1980 production levels of securistes can be maintained with a 20% increase in matrones trained during 1981 and 1982, the training outputs envisioned in the PP can be met and funds absorbed.

Recommendation 1.91: It is recommended that the MOH concentrate on increasing their training plans for one or two Departments to insure full utilization of RHIP support available for VHT training within the present life of project.

The team commends and encourages DDS's and the MOH to keep up the good work and levels of VHT production achieved, and increases in villages covered by VHTs during calendar year in 1980.

If the project is extended as recommended for an additional 2 years, the teams feels that maintaining momentum of VHT production is essential.

Recommendation 1.92: The team recommends that, if the two-year extension to December, 1984, is approved by Mission and AID/W, the additional sum required to train 1,200 securistes and 1,200 matrones be added to the project budget.

While the team is supportive of this project and believes the direction of the MOH/Niger is correct, it does not advise moving directly to a second phase of the project.

Recommendation 1.93: It is recommended that only a two-year extension be given to the RHIP and that, during calendar year 1983, an in-depth assessment, equivalent to a final, summative evaluation, be undertaken from January through March, 1983. This should be followed by three months of Mission, MOH, and AID/W study of the results. A Phase II design team should begin work not later than September of 1983, completing their work by December 15, 1983.

Work from January to March, 1983, should be both a summative evaluation and a health sector assessment with no less than 6 members on the team. Planning for this evaluation and assessment should be com-

pleted by August, 1982, at latest, to permit recruitment and commitments from high-quality, senior-level, experienced persons by November, 1982.

The Health Development Officer should begin forwarding relevant background documents to the Washington officer who is to recruit and coordinate the team from the Washington side. If as many background documents are assembled beforehand in Washington as is possible, team members will arrive with better background and formed questions and will learn the system more readily. Although this seems logical and self-evident, the present team leader has known of similar carefully planned and coordinated preparation to take place only once in five years with the Agency.

The sequence proposed will permit development of a Phase II project which will build on the strengths of Phase I, identify needs in a mature, considered, and thoughtful manner, and permit design of a realizable project capable of reaching EOPS in a manner which satisfies both the procedural requirements of the MOH and the administrative requirements of AID.

By 1982, there will be a need for review and redesign of the curriculum for matrones and securistes based on the experiences of 1980 and 1981.

Recommendation 1.94: The Mission should plan to make available to the MOH, with its concurrence, a specialist in systematic course design, competency-based training, and health training materials design for the years 1982 and 1983. This individual would be posted to Niamey or Dosso in 1982 to redesign VHT training materials and syllabus, and to Zinder at ENICAS for the academic year 1982-1983 to review and assist in redesign of the certified nurse training curriculum. Preparations should be made to fund such an individual during the 2-year extension.

This individual will be a specialist in educational technology, not in medicine. The priorities as far as subject matter is concerned will be those determined by the GON. The methods by which the GON's priorities are translated into a training process will be terms of reference for this individual. A move from knowledge-based instruction to skills-oriented or competency-based instruction is clearly needed at this time. It was felt by the team that to recommend such an individual to be placed in the system at this time would cause a faltering of VHT production, and we believe, on balance, meeting training targets to be more important at this juncture.

PHC training experts are in short supply and the Mission would be well advised to identify such an individual well in advance; AID should underwrite the cost of bringing him/her to a tested written and spoken 3+ level in French before bringing the individual to Niger.

Recommendation 1.95: Funds permitting, during the extension (1983-1984), the team recommends support for an additional 100 certified nurses (200 person-years) and an additional 40 (120 person-years) of training support for certified nurses and IDEs (State diploma

nurses), respectively. On balance, should there be competition for available funds, the team sees Recommendation 1.94 as having higher priority than 1.95.

Recommendation 1.94 is aimed at increasing quality of human resources produced, whereas 1.93 and 1.95 are aimed at quantity. In the end, the Mission must decide on the balance between quality and quantity. The team feels that, by 1982, within a context of production of large numbers, quality can and needs to be improved. Given sufficient MOH receptivity, the team would put Recommendation 1.94 into effect as soon as is organizationally possible, but not at the cost of VHWs and certified nurses presently being trained.

Support for laboratory technicians would be support for increases in quality. The team recommends that the next evaluation group look onto this matter specifically. It is easier to reshape an ongoing program than to organize it initially. The laboratory technician program is relatively new.

This evaluation team has been unable to get satisfactory or sufficient information on retraining. The individual specified in Recommendation 1.94, if of sufficient expertise, could address this. Alternatively,

Recommendation 1.96: It is urged that the short-term technical assistance provision of the present agreement be used to bring a training specialist to Niger for 3 months to study, examine, and make recommendations solely for the retraining program for VHTs.

A senior-level person fluent in French could produce information useful to the government in this period.

The team feels that redesign of retraining for matrones and secouristes has a higher priority than redesign of their initial training at this point in time.

Recommendation 1.97: In keeping with Section 5.752 of this report, it is recommended that support for sanitation agents be increased to produce the 75 agents envisioned in the PP. The move to a 2-year cycle doubles funds needed to produce them.

The team was disappointed in the failure of the Mission and the MOH to utilize the short-term technical assistance provided in the PP.

Recommendation 1.98: It is recommended that the Health Development Officer, in conjunction with the Chief of Party and the Project Director, after study of this evaluation report, prepare a utilization plan for short-term technical assistance to be discussed with the Mission Director or Assistant Directory by no later than December 15, 1981.

The team has seen literally dozens of possibilities which, if explored with appropriate authorities, could benefit RHIP components.

Recommendation 1.99: In a similar vein, Section 5.74 contains recommendations which the team urges the Mission and the Health Development Officer to seriously consider.

Operational studies not only produce findings but more importantly raise consciousness on important issues. A modest, low-cost relationship between the School of Medical Science in Niger and a School of Public Health (please note- not a School of Medicine) in the U.S. could invigorate and add a spirit of inquiry to the entire Ministry and its operations. Dr. DeSweemer, a Francophone Belgian M.D., M.P.H., experienced in Francophone and Anglophone Africa (Nigeria, Rwanda, Burundi, and elsewhere) and a faculty member at Johns Hopkins, could guide the Mission as to needs, feasibility, and design of a low-cost program which would permit inter-institutional relations. S&T/HEA would be willing to facilitate initial contacts with any School of Public Health the Mission wishes to consider in such a role. The teams, however, recommends it be a U.S. school of public health for a variety of reasons.

Recommendation 2.0: The team commends the GON for the excellence of the "Cinquieme Journees d'Etudes de la Sante" in Zinder and recommends that support for this activity be continued through life of project, into the extension and into Phase II, so long as the level of quality is maintained.

While the returns for the Journees are not measurable, the spirit, increase in awareness, feedback and feed forward, as well as the exchange of ideas among levels in the system bears imitation in other countries. It is an activity which has demonstrated democratic process in the best sense of the term.

## CHAPTER 2.0 INTRODUCTION

### 2.1 Area, Geography, and Climate

Niger lies on the Southern fringe of the Sahara desert 1920 kilometers (1200 miles) from the Mediterranean sea coast and nearly 1600 kilometers (1000 miles) inland from the South Atlantic. Its area of 1,268,550 square kilometers (492,000 square miles) is larger than Texas and California combined. It is bordered on the North by Algeria and Libya, on the East by Chad, on the West by Mali and Upper Volta, on the South principally by Nigeria, and, for a short distance to the Southwest, by Benin.

Four-fifths of Niger is arid desert; the remainder is savanna, suitable mainly for livestock and limited agriculture. The Niger River flows for 480 kilometers (300 miles) along the Southwest border, permitting cultivation of rice and truck produce.

Rainfall, which comes in June-September, ranges from 10 to 82 centimeters (4 to 32 inches). The climate is hot, dry, and dusty, especially in April and May.

Because the North is largely mountainous or desert, 90% of the people are concentrated in a narrow band along the Southern border. Four cities have populations of more than 20,000, but Niger is predominantly a country of 9000 small villages.

Niamey's climate varies with distinct seasons. April and May are the hottest with average noontime temperatures rising above 43°C (105°F) in the shade. Direct sunlight is intense during this period and at night temperatures remain in the upper 20s°C (80°F).

In May the first rains come to a parched landscape and with them the planting of millet and sorghum, both major food crops. Niamey receives an average of 55.8 centimeters (22 inches) of rainfall between May and September, normally in short, torrential downpours preceded by high winds and dust or sandstorms. The surrounding country at this time takes on a verdant hue as crops and native grasses cover it.

The rainy season is followed by a short period of hot, humid weather during October. Temperatures rise to a maximum of 43°C (105°F) and drop to a minimum of 22°C (75°F).

From November to March the weather is dry and pleasant. During this season, clear days are interspersed with hazy and lightly overcast skies caused by the "harmattan," a hot, dry wind carrying dust from the Sahara. However, the harmattan occasionally causes localized dust storms, not unlike those which occurred in the Great Plains of the U.S. in the 1930s.

## 2.2 Government

The Constitution of Niger was adopted on November 8, 1960, and was suspended in April, 1974, following a coup d'etat and the imposition of military rule. While it was in effect, the constitution granted executive power to a President (Chief of State and Head of Government) who was elected by direct universal suffrage for a 5-year term. The President was assisted by a Cabinet composed of 15 Ministers and 2 Secretaries of State, which he appointed. Since April, 1974, the Supreme Military Council has been the highest organ of government and all basic powers have been vested in it. The Cabinet form of government has been retained, however, to administer the country. The present Cabinet contains 6 military officers, 11 civilian Ministers, and 2 civilian Secretaries of State.

Niger's judicial system is independent; it comprises 4 judicial bodies: the Court of Appeals, the Supreme Court, the High Court of Justice, and the Court of State Security.

Niger is divided into seven Departments which are subdivided into 38 Districts (arrondissements). The chief administrator (Prefect) in each territorial unit is appointed by the Chief of State and functions primarily as the local agent of central authorities.

## 2.3 Economy

Niger's economy has made impressive progress since 1974. An economic slide during Niger's crippling 5-year drought (1969-74) was reversed by effective management and an impressive influx of foreign assistance which totalled over \$430 million for 1974-76. On the strength of uranium earnings alone, both the government budget and foreign exchange earnings have jumped nearly 300%, personal taxes have been reduced, and the overall balance of payments has remained favorable. Per capita government expenditures have risen to \$38 per person as compared to \$13 in 1974. The National Investment Fund, receiving income from uranium profits, now comprises nearly 40% of the government spending. However, Niger's budget remains balanced.

Approximately 90% of Niger's work force is employed in some aspect of agriculture or herding. Pre-drought herd levels have been reached and even exceeded (e.g., cattle - 105%) but the government is still emphasizing herd growth. Principal food crops are millet and sorghum. In 1979, for the first time in recent years, millet and sorghum production equalled expected demand, but a large amount of rice must still be imported. Due to rapid population growth and unpredictable weather patterns, similar excess grain production cannot be relied upon in the future.

Niger's main cash crops are peanuts, cotton, and cowpeas. The increased emphasis on grain production and the resultant boost in grain prices, coupled with widespread crop loss due to disease and predators,

has resulted in the decline of cash crop production. Peanut production in 1978 of 14,000 metric tons, down from 145,000 metric tons in 1972, and cotton yields of 6,000 metric tons, down from 11,128 metric tons in 1972, have not been sufficient to keep local processing plants fully employed. Production of cowpeas, spurred by strong demand from Nigeria has grown to 207,000 metric tons in 1978.

Niger's small industrial sector represents about 10% of the gross domestic product. The Ministry of Economic Affairs plays an influential role through its voice in Niger's more than 20 "mixed enterprises," firms in which the government maintains equity participation. They include most of Niger's largest commercial and industrial concerns in industries ranging from electric utilities to cement, peanut processing and textiles.

Uranium production began in 1971 in Niger's desolate Air Mountains region and reached slightly more than 1,800 metric tons in 1978. Established reserves exceed 100,000 metric tons and, to date, have attracted 16 foreign companies from 9 different countries. Two mines are in operation at Arlit and Akouta. Two more are projected to begin operation by 1985. Sustained world uranium prices and steady production increases have provided Niger with considerable foreign exchange earnings, 75% of Niger's exports in 1978, and an important source of development funds, about \$100,000,000 in 1979 alone.

To relieve the need for petroleum-generated electricity, a new mixed enterprise has been created to exploit Niger's vast coal resources in the Air Mountains. The coal will be used to fuel electric generators for the uranium mines and for the Northern city of Agadez.

Niger also has tin, phosphate, copper, and iron ore reserves. The phosphate deposits in the Park W Game Preserve are being evaluated for possible commercial value. Copper and iron ore reserves are probably not commercially exploitable at this time.

Niger receives large amounts of concessionary and grant external financial assistance. Major donors are France, the United States, the Federal Republic of Germany, Canada, Saudi Arabia, and the EEC countries. Development assistance, in accordance with the 1979-1983 Five-Year Plan, emphasizes infra-structure projects, health, education, agricultural improvements, and rural development.

A member of the West African Monetary Union, Niger uses the CFA franc, which is fully convertible into French Francs, as guaranteed by the French government. France, Nigeria, and other EEC countries are Niger's principal trading partners.

## 2.5 Population

An estimated 5 million people live in Niger. The Hausa whose territory extends into Northern Nigeria, predominate in the Eastern portion of Niger and comprise about 50% of the country's population. The Djerma,

another large tribe, were traditionally knights, administrators, and warriors. They are an ethnic subgroup of the Songhai people whose great kingdom in the 14th and 15th centuries embraced what is now Eastern Mali and Western Niger. Because Niger's capital city is situated in their tribal homeland, the Djerma influence has been strong in the central government, especially since independence. The Fulanis (also called Peuls in French), Tuaregs, and Beri-Beri (also known as Kanouri, located in the Lake Chad region) are the next largest population groups. The lithe, stately Fulani and light-skinned Tuaregs are typically semi-nomadic herdsman.

About 90% of Niger's people live within 161 kilometers (100 miles) of the country's southern border. In addition to Niamey, four cities have populations over 20,000: Maradi, Zinder, Agadez, and Tahoua. Except for Agadez, these cities are close to the southern border.

More than 90% of Nigeriennes live in rural areas away from good roads. Over 75% are subsistence farmers who grow millet and sorghum for food crops, and peanuts, cotton, or cowpeas for cash crops.

Although French is the official and administrative language of the country, Hausa and Djerma are also widely spoken. English is a required language in secondary schools, and a well-educated Nigerienne will have at least a thin veneer of English comprehension. However, French is essential for shopping, social life, and most professional contacts.

Niger's people are Muslim and religion is the dominant force in their daily lives. A sense of tradition, fatalism, strong family connections, and consideration and tolerance for others characterize the Nigerienne's approach to the world. Polygamy is practiced widely and families generally are large. In spite of the high infant mortality rate and low life expectancy, Niger's population is growing at about 3% per year.

## 2.6 General Health Status

The health status of Niger is typical of that found in other Sahelian countries with very low per capita incomes and with health resources which are sparse relative to needs. Although statistical data are fragmentary and of uneven quality, estimates from the GON place life expectancy at about 42 years, with a crude death rate around 25, a birth rate of about 52, and an annual population growth rate of approximately 2.7%.

The infant mortality rate, perhaps the best single indicator of health status, is very high. It is estimated as ranging from 162 to 200, probably closer to the lower level, according to the statistical section of the GON/MOH.

Reporting of morbidity and mortality in Niger is very incomplete. In the city of Niamey only about 20% of deaths are recorded and less than 10% are recorded in rural areas. The statistical service of the MOH re-

ceives weekly telegrams from essentially all 38 arrondissements, providing information on 12 reportable diseases (see Table 1). This procedure serves as Niger's epidemiological information system. Particular attention is paid to measles, meningitis, malaria, and diarrhea.

Tables 2 and 3, based on MOH or WHO statistics reveal incidence and case fatality rates for the 12 reportable diseases from 1975 through 1980. No significant change in disease incidence or fatality rates was evident from the MOH data, but the WHO report suggests a recent drop in measles deaths. In 1979, there was a shift in the criteria for reporting diarrhea cases, including only those where there was clear-cut dehydration. The number of diarrhea cases reported in 1980 dropped significantly from previous years and the case fatality rate rose. These changes are a function of differences in reporting criteria and possibly because of greater attention to diarrhea as a cause of death, rather than to true change in disease characteristics.

Nationwide, at least 50% and possibly 60% of total deaths occur in children under five. The predominant causes are relatively easily preventable diseases - malaria, measles, and diarrhea - combined with malnutrition. Other bacterial and viral infections, e.g., tuberculosis, meningitis, and hepatitis, are also important causes of morbidity and mortality. In the older age groups, venereal infections are frequent. Accidents (trauma) make up about 10% of all diagnoses reported.

Although not backed up with hard data, a French pediatrician who has worked for several years at the National Hospital in Niamey reports that deaths due to malaria in Niamey city are dropping. This she relates to increasingly better coverage of MCH services and increased health awareness among the population.

## 2.7 Rural Health Status

The disease pattern in urban and rural areas is quite similar, but severity of cases is generally worse outside major cities. Since 90% of Niger is rural, it follows that illness patterns reported more directly reflect the weight and volume of reported rural illness, given the reporting system and categories employed. Increased severity of illness in the rural populace is the result of many factors: the greater impact of drought on nutritional status, a considerably less adequate and accessible health care system, problems in basic environmental sanitation, and more limited availability of water supplies.

The GON rural health policy recognizes these problems and, indeed, GON resolve to ameliorate and resolve these problems, through self-help USAID and other donor assistance, have made possible this project and the present evaluation.

The government recognizes the need for an improved health information system, but, given the option of either spending resources on information or on services, it has quite correctly opted to increase services and thereby increase access, availability, and coverage as a higher priority for its own resource allocation.

Table 1.

REPORTABLE DISEASES IN NIGER 1975-78

	<u>1975</u>		<u>1976</u>		<u>1977</u>		<u>1978</u>	
	<u>Cases</u>	<u>Deaths</u>	<u>Cases</u>	<u>Deaths</u>	<u>Cases</u>	<u>Deaths</u>	<u>Cases</u>	<u>Deaths</u>
Malaria	292,132	272	323,799	150	296,246	174	307,837	155
Diarrhea, Severe	25,315	38	25,744	111	24,469	32	20,872	95
Measles	9,018	71	22,620	343	18,173	340	33,012	389
Whooping Cough	8,792	10	4,482	7	4,476	0	3,836	2
Chickenpox	4,749	0	6,171	0	6,037	0	2,105	1
Meningitis	3,738	221	1,144	28	3,034	218	9,244	580
Pneumonia	3,726	42	4,575	22	4,012	0	5,495	43
Influenza	2,371	2	4,827	0	3,084	0	2,257	1
Jaundice	2,121	45	1,065	43	883	28	1,708	43
Tetanus	165	38	341	38	349	53	338	59
Polomyelitis	163	2	232	9	250	2	189	4
Diphtheria	29	2	463	4	97	20	52	15

Source: Ministry of Health/GON

Table 2

REPORTABLE DISEASES IN NIGER, III TRIMESTER (JULY, AUGUST, SEPTEMBER) 1978-80

	<u>1978</u>		<u>1979</u>		<u>1980</u>	
	<u>Cases</u>	<u>Deaths</u>	<u>Cases</u>	<u>Deaths</u>	<u>Cases</u>	<u>Deaths</u>
Malaria	101,375	62	153,173	64	152,770	61
Diarrhea, Severe	4,948	15	4,866	28	2,485	55
Measles	1,678	20	2,331	9	2,594	9
Whooping Cough	814	0	1,887	0	1,171	0
Chickenpox	107	0	82	0	88	0
Meningitis	165	11	110	5	103	3
Pneumonia	876	11	475	6	575	3
Influenza	465	0	260	0	571	1
Jaundice	426	6	333	7	332	3
Tetanus	74	23	36	6	94	20
Poliomyelitis, acute	45	1	124	1	145	4
Diphtheria	13	5	16	1	22	2

Source: Ministry of Health/GON

Table 3

REPORTABLE DISEASES IN NIGER, 1979-80

	<u>1979</u>		<u>1980</u>	
	<u>Case</u>	<u>Deaths</u>	<u>Case</u>	<u>Deaths</u>
Malaria <sup>1</sup>	262,035	141	290,649	116
Diarrhea <sup>2</sup>	12,714	62	7,681	154
Measles <sup>3,4</sup>	353,555	439	31,761	222
Whooping Cough	5,444	2	5,184	5
Chickenpox	1,960	0	1,460	1
Meningitis	5,923	164	3,968	258
Pneumonia	2,951	19	2,253	15
Influenza	840	1	1,464	0
Jaundice	1,142	27	973	24
Tetanus	251	35	270	52
Poliomyelitis	263	5	354	6
Diphtheria	31	2	27	4

Source: Annual Report, 1981, of the WHO Representative in Niger

- 1) Increase in cases in 1980 is said to be due to better reporting.
- 2) Criteria for reporting were changed in 1980 to include only cases with dehydration.
- 3) Case mortality rate has dropped progressively in the past two years: 1978 - 1.53%; 1979 - 1.24%; 1980 - 0.69%. Cause for this regression has not been established. In 1978 there were 32,644 cases reported with 502 deaths.
- 4) The 1978 figures reported here are at variance with those reported in the Annuaire Statistique 1978-1979, published by the Ministry of Plan. Those figures showed 33,012 cases and 389 deaths, for a case fatality rate of 1.18%.

## 2.8 Ministry of Health Organization

The Ministry of Health and Social Affairs is highly centralized with a vertical line of command. All major policy decisions are made by the Minister with the advice of the Cabinet. The Secretary General is responsible for administration, coordination, and supervision of the technical divisions and their operations; division directors report directly to him. Contacts with health officials, at central and peripheral levels, are to be cleared with the Secretary General or through the Secretary General with the Minister. The Cabinet appears to play an active role in all major administrative decisions.

Present Ministry organization reflects the outcome of an 11-day seminar held in Tahoua in July, 1976, in which the outline of a new structure and newly-assigned functions for various divisions in the Ministry of Health were laid out. Together with the new structure and newly adopted strategies, the Ministry was to achieve the goal of providing "effective, permanent, and total health coverage of the population wherever they are located..."

The Ministry is organized into divisions and offices indicated in the organization. Summary descriptions of the major units follow.

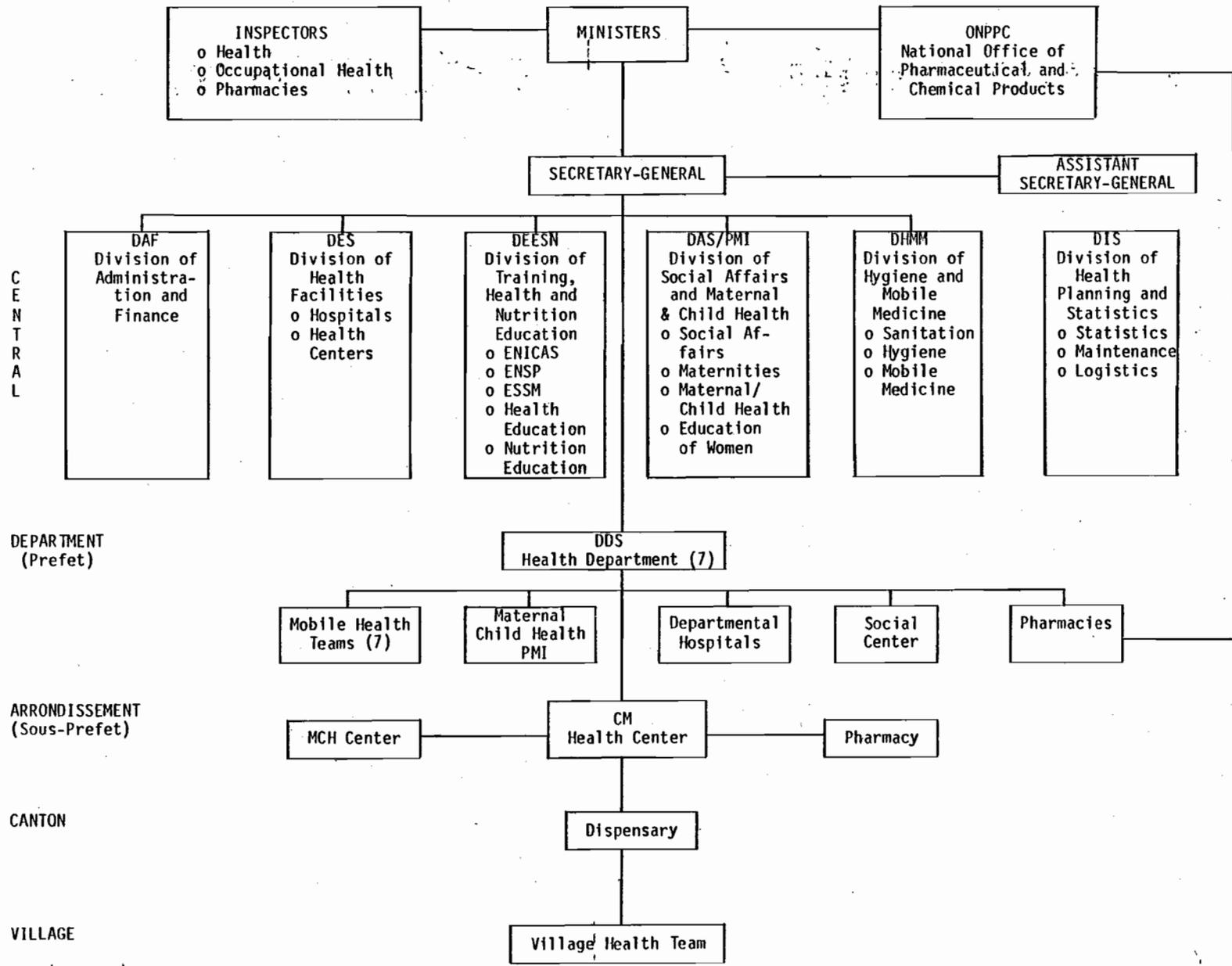
### 2.81 The National Bureau for Pharmaceutical and Chemical Products (Office National des Produits Pharmaceutiques et Chimiques - (ONPPC))

The Office National des Produits Pharmaceutiques et Chimiques (ONPPC), while not a division, operates directly under the Ministry of Health. It acts as a mixed governmental and private organization which has the monopoly to buy and sell all pharmaceutical products, as well as medical and surgical supplies. ONPPC operates as a nonprofit organization; products and supplies are sold at a mark-up sufficient to cover the cost of operation. Prices are fixed by the Ministry of Economic Affairs and are set once a year; the mark-up includes transportation, excise taxes, and other related costs.

Pharmaceutical products and medical supplies are sold through community pharmacies (Pharmacies Populaires) which are quasi-governmental outlets located in each of the 8 major towns and village pharmacies. Depots of medical supplies are at half a dozen locations scattered throughout the country. A few private pharmacies exist but they are primarily located in the capitol.

The ONPPC maintains lists for all medication used in the country and computerized stocking and disbursement record keeping system. It carefully controls a standard formulary list used at each level: the Departmental hospitals, the arrondissement medical centers; the dispensaries, and, finally, at the lowest level, the village health workers. The latter are trained to use only about 9 medications - 4 pills, 4 liquids, and one eye ointment. At the next level, the formulary consists of about 120 items. The medical centers obviously require more. In view of dif-

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ferent sources of drugs with various language labelling and different potencies, it becomes important for ONPPC to regulate a standard formulary, particularly for use in primary health care centers.

The ONPPC has several modern laboratories for quality control and drug analysis. Out-of-date pharmaceuticals donated by voluntary agencies or other groups are checked for potency and safety. In addition, the ONPPC prepares sterile parenteral solutions, manufactures a number of drugs, and has a repackaging operation. Another activity is investigation of traditional medicines.

Drug orders for specific periods, 3 or 4 months, are collected by each Departmental Director of Health (DDS) and submitted to the MOH. Orders are based on the prior period's utilization records reflecting local patterns of use and disease; the MOH may make further adjustments. Drug orders for each DDS are collected at the main ONPPC warehouse. On notification, the DDS sends a truck to Niamey to pick up the order. The only exception to this mode of operation is Bilma where military vehicles are utilized to deliver drugs. It is interesting to note that, since drug prices are uniform throughout the country and transportation costs differ widely, the departments close to Niamey are indirectly subsidizing more distant and thus more costly locations.

The ONPPC appears to be a dynamic, expanding organization under strong leadership.

#### 2.82 Division of Administration and Finance (Division D'Administration et Finances)

This division was created in January, 1977; its functioning prior to inception had been handled by the Ministry of Finance. MOH officials stated that the Ministry itself has traditionally performed its own finance and planning functions, and, in that respect, is somewhat ahead of other Ministries in the government. The main reason that complete jurisdictional control over financing and planning was not given to the Ministry of Health earlier was due to precedents that this action would set vis-a-vis other parts of the GON. MOH officials state that other Ministries in the GON are not as well prepared to undertake functions of this type as the MOH. These statements were corroborated by officials in the Ministry of Plan.

At present, the Government of Niger uses a French-derived system of budgeting and accounting. All receipts are received by the Treasury which keeps the accounts, records all transfers and exchanges, and controls indebtedness. There is now an explicit policy that all expenditures of government must be budgeted prior to expenditures accounted for. The Treasury houses a computer. The Nigerienne fiscal year begins on October 1st.

The financial management system of Niger is basically a cash system of receipts and disbursements rather than an actual accounting system. There has been no attempt to establish systems of accounting and report-

ing which provide comprehensive planning information. In keeping with a concept of a low-cost, simple system of health delivery, this may be the preferred system. It should be modified, however, to provide suitable statistics and management information.

Although records are kept at all levels of use and reports are made to the next highest level, the form and content are for simple tabulation and summation to provide information to the next highest level in the system. At the lowest level, reporting of activities is accomplished simply by checking types and quantities of service on site using a form graphically designed so that the reporter need not be able to read or write since, in Niger, a majority of the population is illiterate.

Responsibility for reporting is placed with the Secretary-Treasurer of the Village Health Team (ESV). Other members of the health team (the president, secouriste, and matrone) provide this information to him. He records the information and reports it to the next highest level.

The MOH can be expected to receive approximately the same percent of the national budget as in the last 2 or 3 years. Additional absolute amounts of monies will nonetheless have to be allocated to cover increased quantities of health services and the growing infrastructure supporting these services, plus an inflation factor which has recently exceeded 15% per annum.

Allocation of monies is not done by a planning, program, and budgeting system, but rather through a system involving expenditure projections. This approach has disadvantages with respect to evaluation of cost-effectiveness of specific parts of the health delivery system. Planning for numbers and specific types of health workers is carried out as a separate operation, with each major administrative division of the GON receiving a personnel allocation which is kept in balance by a coordinating committee. For instance, incoming students entering health training institutions are tracked and planned for well in advance of becoming civil servants.

While this system seems cumbersome and lacking in accountability, it functions throughout Francophone Africa. The MOH has been ahead of other divisions of the government in that it has carried out its own finance and planning functions for some time. To date, much of the heavy load of future planning has rested on the shoulders of one or two key Ministry officials. With expanded services and programs, more donors interested in the health sector, and the degree of uncertainty attached to heavy reliance on external financing, policy management of health budgets to achieve desired MOH goals is becoming a difficult task.

### 2.83 Division of Health Facilities (Direction des Etablissements des Soins - DES)

This division (DES) is responsible for both the hospital and rural health systems. Hospitals include National Hospitals in Niamey and Zinder, Departmental Hospitals in each of the 7 Departments, and small

arrondissement hospitals. The DES has no authority over budgets of the different hospital facilities however. Funds are provided directly from the Ministry to each hospital unit and arrondissement center. In general, all hospital services are provided free of charge. The National Hospital in Zinder estimates, for example, that only 5% of its patients are private patients and capable of paying for hospitalization. Similar proportions are prevalent in other parts of the country.

The division's aim, with respect to hospitals, is to provide appropriate care with surgical, internal medicine, obstetrical and gynecological services, in order for these facilities to backstop the chain of referrals beginning with Village Health Teams and on up through the dispensaries, health centers, and finally to the hospital level. There are many problems which make this chain ineffective and these are touched on elsewhere in this report.

Directly under the DES is the rural health system consisting of Departmental facilities and services, the arrondissement health centers, dispensaries, and the Village Health Teams.

Each department has a Director of Health Services, known as the DDS. He coordinates all health activities in his department and has direct responsibility for facilities and the rural health services. Other Ministry divisions, such as DAS/PMI, DHMM, and DEESN, actively participate in the provision of their particular services. These divisions will be described below.

While DDS's report to the Director of DES, they also report directly to the Minister and Secretary General of the MOH.

#### 2.84 Division of Training, Health, and Nutrition Education (Direction de L'enseignement et de l'Éducation Sanitaire et Nutritionnelle - DEESN)

This division (DEESN) is responsible for the training and retraining of professional and paraprofessional health personnel and social aids and assistants. It shares with the Ministry of Education the responsibility for the School of Medical Science, University of Niamey.

The emphasis in the retraining program is on short-term seminars at Central Departmental, and arrondissement levels. The seminars, their numbers, curricula, and participants detailed in the Three-Year Plan (-1976-1978) have been followed as closely as possible. In the field of health and nutrition education, the division shares responsibility with the Division of PMI (Maternal-Child Health). A specific nutrition unit has been established within the training division.

#### 2.85 Division of Social Affairs and Maternal-Child Health (Direction des Affaires et de la Protection Maternelle et Infantile - DAS/PMI)

MCH services are provided by the Division of Social Affairs and PMI. The immediate goal of the division is to extend the MCH services (Prenatal care, deliveries, post-natal care, infant nutrition program) to all dispensaries in the nation. The number of dispensaries offering PMI services increased from 19 in 1974 to 141 by the end of 1980.

The PMIs are staffed by trained midwives, certified nurses, and social assistants who operate the health/nutrition program and provide education for women (sewing, literacy). The PMI has been quite successful in extending services to pregnant women and sick children.

Another important function of the PMI in the rural areas is training, retraining, and supervision of matrones, and establishing a referral system that enables matrones to get prompt assistance with unexpectedly difficult deliveries or where complications present themselves.

The MOH gives highest priority to combatting malnutrition through the PMI nutrition program. This program, utilizing growth charts, emphasizes regular follow-up weighing of children 0-2 years of age and nutrition education for mothers which includes demonstrations in preparing locally available foods to supplement breastfeeding. This educational program is now being promoted in all PMI centers, maternity centers, departmental and arrondissement health centers, social centers, and, increasingly, through rural dispensaries. There is also a mass-communication program utilizing broadcast radio announcements, pamphlets, signs, and posters.

The PMI is well organized and supervised and increasingly supported by health services personnel. Constraints to effective functioning lie in a lack of trained personnel to staff centers and a lack of needed support services such as supplies, medications, refrigerators, and appropriate transportation.

#### 2.86 Division of Hygiene and Mobile Medicine (Direction de L'Hygiene et de la Medecine Mobile - DHMM)

The Division of Hygiene and Mobile Medicine puts first priority on mass immunization programs against communicable diseases. The division mass immunization program includes DPT, DT, measles, poliomyelitis, meningitis, and BCG vaccinations. Periodically, cholera and yellow fever vaccinations are also available.

During the French colonial period, some mobile units were equipped with x-ray and laboratories. The Director of the Division abandoned these units because they were expensive and impractical, given the poor roads. Some curative services are also offered. Additional information on this division is found elsewhere in this report.

## 2.87 The Division of Infrastructure and Statistics (Direction de L'Infrastructure et des Statistiques - DIS)

The Division of Infrastructure and Statistics was formally established in the Ministry of Health on May 2, 1977. The present Director is a former Sous-Prefet with administrative experience but with no training in health planning.

The Section of Health Statistics presently employs two "agents statistiques." One more is undergoing a three-year training program at IDEP in Dakar and is due back in the summer of 1981 or 1982. An expatriate physician epidemiologist has served as Director of the Health Statistics Section since 1978. He will leave in August, 1981, and will be replaced by a Nigerienne physician.

This section is responsible for collecting, analyzing, and reporting of epidemiological surveillance data received weekly by cable from the 38 arrondissement level collection points. The section reports data on the major pestilential diseases (meningitis, measles, plague, smallpox, yellow fever, epidemic typhus) in a "Bulletin Hebdomadaire" to the 10 surrounding countries which, by international agreement, exchange epidemiological surveillance data. The section also publishes a monthly bulletin reporting on the main communicable diseases - incidence and deaths - extracted from the ICD short list of disease entities; a quarterly bulletin providing reports on causes of deaths by age groups (0-1 year; 1-4 years; and 5-14 years); on numbers of new patients seen by the health services; and total number of hospital days. These reports are compiled and published in an annual bulletin.

Under a USAID-supported project, Africare provided a statistician (MPH) posted for one year (1979-1980) to Niamey. He helped design forms for reporting and also developed simple analytical techniques for data processing. A second statistician was to be posted by Africare, but his position has not yet been approved by the Director of the DES Division.

A third section of this division is a logistics section. This section is responsible for transport maintenance (establishing garages and repair facilities) and for medical equipment repair and maintenance. USAID funding presently supports much of this activity.

## 2.9 Health in the Quinquennial Plan (1979-1983)

The government of Niger, in pursuit of the objective of health for all by the year 2000, intends to build upon its accomplishments to improve the quality and quantity of health care available to its citizens. Major emphasis is to be on further development of health facilities to make appropriate curative and preventive care and health education programs widely available, and on reaching the most remote rural areas with health care teams. This is to be made possible by stressing a self-reliant training and development (auto-encadrement) approach to increase

village-level coverage with health services. To attain its goals, specified targets have been developed for the next plan period.

The Five-Year Plan of the GON (1979-1983) indicates that 9% per year of the total GON budget over the next five years is to be devoted to the health sector. This represents a substantial increase in commitment since the previous Three-Year Plan (1976-1978) set the health sector proportion at 5% per year.

It is clear that, in both proportional and absolute terms, health is considered an important development sector. Since the preponderant proportion of health sector activities is in the public sector, and since private practice has been virtually prohibited for a number of years, it can be seen that Niger is determined, with the limited resources at its disposal, to improve the health of its people it has proportionately expanded financial support in service of this objective.

A number of quantified objectives and goals have been set for the 1979-1983 plan period. With effort, the team believes they are reasonably attainable.

#### 2.91 Quantitative Objectives for the Health Sector 1979-1983

- 1) The number of villages covered with VHTs is to increase from approximately 1500 in 1978 to 4000 in 1983.
- 2) Population per dispensary or health center is planned to decrease from 26,700 in 1978 to 19,100 in 1983.
- 3) At the end of the Plan period, the following ratios are targeted:
  - a) one medical doctor per 30,000 people versus 50,000 in 1978
  - b) one pharmacist per 240,000 people
  - c) one state nurse per 8,250 people
  - d) one midwife (Sage-Femme) per 2,852 women of child-bearing age
  - e) one certified nurse per 3,911 people

The promotion of family health during the Plan period is to be accomplished by:

- a) further development of services provided by PMI and through training additional needed numbers of workers
- b) improvement of the health of child-bearing aged women
- c) as rapid a reduction in maternal, prenatal, infantile, and juvenile morbidity and mortality as is possible.

#### 2.92 Policies and Objectives for the Health Sector

There are four general and seven specific targets which were delineated in the Five-Year Plan. General policies advocated are:

- 1) continued growth of health infrastructure (facilities, equipment, etc.)
- 2) intensification of efforts in training and manpower development at all levels
- 3) reorganization of health services to provide increased and optimal levels of service
- 4) study of a health insurance program

Areas of specific priority emphasis are to be:

- 1) maternal and child protection
- 2) hygiene and sanitation
- 3) nutrition
- 4) medical supplies and distribution
- 5) rationalization of health delivery services
- 6) improved distribution of health personnel
- 7) intensification of training efforts

As indicated in the Plan, by the end of the Plan period there will be 11 additional dispensaries built and 19 existing structures will be renovated. In addition, it plans construction of 14 PMI centers, 16 maternity wards, and 8 health centers (CMs).

### 2.93 Regional Policies and Objectives

The Plan document, in Part II - Regional Policies and Objectives, indicates the GON's awareness of the regional disparities which exist in the country in terms of resource allocation and qualified manpower distribution in the various departments. Regional objectives of the Plan are to extend health care coverage in the country within a framework of reducing regional disparities in coverage and to improve efficiency of health service delivery by adopting appropriate region-specific measures.

Six major problems are identified in the Plan:

- 1) concentration of resources in urban centers, especially Niamey
- 2) lack of equipment in dispensaries of high population density such as Mirriah, Ilela, Tahoua, and the Department of Maradi
- 3) reluctance of certain regions to adopt health improvement measures
- 4) low efficiency of the VHTs in all departments
- 5) high medical risks encountered in specific zones of the country
- 6) low efficiency of mobile health care due to lack of resources

In order to improve the efficiency of health delivery services country-wide, the Plan envisions increased efforts in sensitization of the population, with special emphasis on the pastoral regions of the country, and on Diffa where there is said to be reluctance to accept health improvements, despite the fact that it has a good health infrastructure as compared to those of the other departments.

Additionally, the Plan is aimed at reducing regional disparities between Niamey, where there are 27,500 inhabitants per medical doctor, and 68,300 in other parts of the country, by assigning a larger proportion of new MDs to other Departments of the country. This policy is also to apply to other health professionals such as certified and state nurses and midwives.

Training of VHTs is specially mentioned in the Plan with a specific reference to the need to strengthen the training offered in order to reduce the absenteeism frequently encountered in the countryside. Regarding training of all other professionals although not a regional problem, appropriate distribution will contribute to the improvement of health services to all Nigeriennes. As a final point in the discussion on regional disparities, the Plan makes a policy recommendation to establish a health education program in public schools to increase the awareness and importance of good health to all students.

A review of the Plan Implementation Report for 1979 indicated that the GON experienced difficulties in undertaking the expenditures outlined in the Plan a year earlier. It was only possible to execute less than half the activities and operations previewed in the Plan by drawing down less than 40% of credits obligated by FNI to the health sector.

## CHAPTER 3.0 PROJECT BACKGROUND, PURPOSE, AND DESCRIPTION

### 3.1 The Historical Basis of the GON Rural Health Strategy

In order to understand the GON's health strategy in relation to existing health and disease conditions and available health facilities and services, it is useful to examine the past history of Nigerienne health policy and performance. There is a clear and consistent recent direction to GON that is impressive relative to other West African states policy and performance.

At independence, the Republic of Niger was in the position of other land-locked Sahelian countries, with a lack of effective infrastructure and lack of resources in the health sector described in previous documents (c.f., Rural Health Services PRP, 1976; Health Sector Assessment, 1977). Realizing that a far-reaching reform of the health sector would be necessary if health services were to reach the mass of the population, the GON, in 1964, prepared a Ten-Year Perspective on the Development of Health Services (1964-1973). This study was financed by USAID with technical collaboration from WHO. In a preface to the study, the Minister of Health underlined the need for basic reform that would "permit transformation and progressive abandonment of structures of the colonial period to the benefit of an organization designed and adapted to the needs and capabilities of the Republic of Niger." The Minister identified the two greatest impediments to this reform as "lack of qualified personnel, and the insufficiency of financial resources."

In the 1964 study, highest priorities were assigned to (1) "medecine de masse," i.e., public health, preventive, and simple curative services to be provided to the rural population; (2) health education - especially MCH (mother and child health), nutrition, and village hygiene; and (3) training of Nigerienne health workers. In contrast to most other African countries, much lower priority was placed on development of hospital-based services in urban areas.

At the same time, and continuing to the present, the GON placed emphasis on development of health auxillary training at the village level. The village "secouristes" had been developed throughout French colonial health systems in Africa. This person acted mainly in first aid and as a liaison with mobile services of the Service des Grandes Endemies.

Beginning in 1959 in Tahoua, and developing most strongly in Maradi throughout the 1960's the concept of the Village Health Team (VHT; French acronym - ESV), consisting of a securiste with preventive and curative functions, and a re-trained traditional midwife ("matrone"), gained momentum. These securistes and matrones were placed in villages through community participation in selection and support, and supervised by Ministry of Health personnel in the "circonscription medical (CM) (health center), at the arrondissement level, and from Department level. This concept developed progressively with MOH support beyond that to found in other Sahelian countries.

With the change of government in 1974, and an administration wishing to develop a broad base of support in rural areas, priority emphasis on further development of "medecine de masse" through VHTs gained added importance. Major constraints remained the same as those of 1964 - lack of trained personnel and lack of financial resources. These overshadowed other important technical considerations regarding the nature of the training function or the supervision of securistes and matrones. Nonetheless, GON basic policy and strategy has remained consistent, firm, well thought out, and effected through priority allocation of available scarce resources to rural health.

In order to be effective, a health delivery system should be available, accessible, and acceptable to the population it serves. Adhering to these basic principles, the GON established a VHT rural health delivery system designed to meet health needs of the rural poor. The ultimate goal was to improve, at low cost, the health status of rural Nigeriennes and to increase their quality of life (i.e., life expectancy) and their capacity to work.

Recognizing the limitations of existing health delivery system, the MOH developed a Three-Year Plan (1976-1978) which emphasized the following objectives:

- a) to strengthen the existing health system components; and
- b) to expand geographic coverage and numbers of people served by the health system.

Consistent with these objectives, the RHIP project was designed to assist the MOH in establishing an improved integrated health system appropriate to Niger's resources and rural population needs.

The MOH has also planned for the five-year period 1979-1983 described in Sections 2.91, 2.92 and 2.93 above. At the end of this period, the Ministry projects VHTs will be functioning in 3,500 villages and cover at minimum 39% of the rural population. These villages are expected to show some increase in life expectancy, a decrease in infant mortality, and decreases in worker incapacity.

### 3.2 Project Purpose

The purpose of the RHIP is to support the MOH's present strategy to develop a viable rural health delivery system. Such a system will advance its plans for demonstrating the value of prevention, early diagnosis, timely durative intervention, and proper referral. This project concentrates its efforts in broad categories: human resource development and institutional support.

In support of the MOH's health strategy, this project will:

- a) increase the number of health personnel at all levels, and

- b) strengthen the present institutional system through provision of additional drugs and supplies for VHTs, resources required to sustain and support VHT activities (i.e., dispensaries and health centers), and resources required to link various levels of the system together.

Although project inputs may be viewed as two distinct components, expected outputs will integrate these components to serve the project purpose and GON health strategy goals targeted for 1982. By this date, better trained and more strongly supported VHTs will render improved basic health care to 3,500 villages.

### 3.3 Project Description: Summary

A detailed description of this project may be found in the Project Paper (Niger: Improving Rural Health, #683-0208) which contains 180 pages of descriptive text and annexes. The following is an abbreviated summary of major features and support to be provided under this project.

The RHIP project was preceded by the Basic Health Services Delivery Project (#683-0214) which concentrated major efforts on Diffa Department. If a deeper understanding of the background leading to the RHIP is required, that Project Paper should be examined.

#### Improving Rural Health

The Improving Rural Health Project (RHIP) is a major national primary health program for Niger. The project's emphasis is on training 1,500 village health teams, a total of 6,000 people, and retraining about 13,500 existing village health workers. The plan, in 1978, was to bring basic health services to 3,500 villages about 39% of the rural population.

Village health teams are comprised of 2 matrones and 2 securistes supported by an administrative committee. The VHTs are selected by the communities which they serve and are trained and supervised by dispensary nurses. Secouristes and matrones carry out minor curative care and disease prevention activities. The matrones perform traditional midwifery, enhanced by training in modern medical practices. Both refer cases beyond their capacity to dispensaries.

The RHIP project also expands and strengthens other parts of the health system, particularly support services vital to the success of the VHTs. Generally support includes: upgrading and expanding the number of professional health workers assigned to rural areas, increasing their mobility, improving facilities, and providing sufficient drugs and supplies.

Specifically, this support includes:

### Training of Personnel

- Academic health training for 25 teachers, senior MOH officials, and logistic/maintenance personnel, at a rate of 2 teachers, 2 MOH personnel, and 1 maintenance persons per year of the project.
- 1,100 persons participating in MOH continuing education conferences
- 40 certified nurses, 20 state nurses, 35 medical students, 15 environmental health workers in technical training each year of the project
- 25 medical equipment technicians and 50 auto mechanics trained by short-term consultants

### Institutional Support

- 200 Mobylettes for supervisors and 42 functioning 4-wheel drive vehicles for better supply distribution which is also expected to lead to 45% more supervisory visits to health centers and dispensaries, and a 10% increase in operational efficiency of all vehicles
- 2,700 VHTs equipped with drugs, educational materials, and other supplies
- Sanitation improvements for 250 existing health facilities
- 7 new dispensaries and 2 department health centers in Zinder and Agadez
- Mobile health units immunizing 100,000 persons per year
- 2 garages and medical repair shops at the department health center
- Sanitary education programs reaching 35% of the rural population

Following this evaluation the Improving Rural Health Project will be redesigned, and the Diffa project has now been merged into the RHIP project.

According to the AID Project Paper (March 30, 1978) "in keeping with the AID country strategy, the project focuses on preventive aspects of health care and offers a program which the GON will be able to sustain and operate upon completion of the project." The Project Paper also states (page 94) that: "Objectives contained in this Project Paper are the result of joint planning meetings with the Ministry of Health and reflect the wishes of the government and the professional judgement of an experienced Project Paper team. Unless unforeseen exigencies develop, we expect to carry out the program to full realization."

## CHAPTER 4.0 OBJECTIVES AND METHODOLOGY OF THE EVALUATION

### 4.1 Administrative Basis of the Present and Past Evaluations

While explicit provision for evaluation during the life of project was made in the RHIP Project Paper, strategy for major evaluations was to emerge from joint meetings between the MOH and AID during initial stages of implementation. Evaluation was to relate to the goal of providing, at low cost, health services to improve the quality of life and increase the working capacity of the rural population in some 9,000 villages in Niger.

The first full-scale evaluation was planned to take place at the end of the second year of the project. An AID-MOH conference was to be convened and recommendations from this evaluation were to be discussed and adjustments suggested by participants for the final portion of the project. The mid-term evaluation was clearly intended as a formative evaluation, whereas the final evaluation, 6 months prior to the end of the project, was planned to be summative in nature, to pass judgement on the success of the project, and to chart directions for future health efforts (RHIP PP, p. 77).

Joint reviews were also planned for years one, two, and three of the project. The purpose of these reviews was to examine performance targets, progress made, and review and consider management issues.

The joint review planned for early 1980 was not completed. A 2-man U.S. evaluation team arrived in Niger in April, 1980. Developing an agenda for the review was never completed. Procedural requirements of the MOH used up time available to the U.S. team, and they returned home empty-handed. The Mission commented,

"If any lessons are to be learned from this experience, the Mission hopes that fuller understanding is gained of the divergence of priorities and perspectives held by host governments on the importance of evaluation (despite signed agreements) and the problems facing the field daily in the conduct of field operations. These problems are compounded by numerous personnel changes within the Ministry and lack of a full-time GON Project Director (both topics of discussion in the upcoming evaluation.)"

At the time of the present evaluation (1981), the RHIP had not yet obtained the services of, or appointed a full-time Project Director as originally specified in the Project Grant agreement.

The GON/MOH has operated on the basis of a signed Project Agreement supplemented by Project Implementation letters (see Appendix A). The GON, while believing this Agreement to be the documentary basis for the project, also knew of the existence of the Project Paper guiding AID's thinking. This Project Paper had not been made available to the MOH.

The U.S. team discovered, soon after its arrival, that the GON did not have a PP in its possession, either in English or in French. Matters were further complicated by the fact that the Project Agreement was far less specific concerning evaluation than was the Project Paper. The GON knew of the existence of the RHIP Project Paper but did not have a copy. Partially as a result, the initial atmosphere was tense during discussion of criteria for the present evaluation. The evaluation team believed the Ministry had need of this document since it guided AID's day-to-day thinking; the team persuaded the Mission to change its position on the matter. With the concurrence of the Mission, a translation into French was made and several copies of the Project Paper were delivered to the GON/MOH team at one of the plenary sessions. There was a perceptible reduction in tension after the Project Paper was shared.

In the GON/USAID Project Grant Agreement, language which explicitly or indirectly relates to evaluation is found in 3 sections. The first of these appears in Section 4.1 (First Disbursement) on page 3, stating a condition precedent which agrees to:

- "(a) A description of the procedure for conducting semi-annual meeting to evaluate and assess the following aspects of the project:
- 1) Evaluate progress towards attainment of the project objectives.
  - 2) Identify and evaluate problems or constraints which may inhibit the achievement of project objectives.
  - 3) Assess how observations may be used to help overcome such problems.
  - 4) Evaluate to the degree feasible the overall development of the project."

Section B.1 Consultations (page 19) of the Project Grant Agreement also touches on evaluation matters by stating:

"The parties will cooperate to assure that the purpose of this Agreement will be accomplished. To this end, the Parties, at the request of either, will exchange views on the progress of the project, the performance of obligations under this Agreement, or supplies engaged on the Project, and other matters relating to the Project."

Finally, Section B.5 (page 20) entitled, Reports, Records, Inspection, and Audit, states that the GON will:

- "(a) furnish AID such information and reports relating to the Project and to this Agreement as AID may reasonably request;
- (b) maintain or cause to be maintained, in accordance with generally accepted accounting principles and practices consistently applied, books and records relating to the Project and to this Agreement, adequate to show, without limitation, the receipt and use of goods and services acquired under the Grant. Such books and records will be audited regularly, in accordance with

generally accepted auditing standards, and maintained for 3 years after the date of last disbursement by AID; such books and records will also be adequate to show the nature and extent of solicitations of prospective suppliers of goods and services acquired, the basis of award of contracts and orders, and the overall progress of the Project toward completion; and

- (c) afford authorized representatives of a Party the opportunity at all reasonable times to inspect the Project, the utilization of goods and services financed by such Party, and books, records, and other documents relating to the Project and the Grant."

While there is no question that the GON accepted the language of the Project Grant Agreement and its terms in signing this document, nonetheless the MOH was unclear as to criteria that would be employed in a large-scale or formal team evaluation, and, as other sections of this evaluation report, responded in a procedurally cautious, protective manner, and, with respect to requests made by the team to visit, talk, or exchange views openly, responded in a reluctant, protecting fashion.

#### 4.2 Procedural Constraints to the Evaluation Process

Procedural requirements imposed upon the U.S. evaluation team by the Government of Niger limited time available for interviews and data gathering as well as for open communication with GON central and project officials. Shortly after the arrival of the U.S. team, contacts with individuals heading Ministry of Health Departments were effectively barred. The Project Director refused any individual appointment or discussion prior to the field visit and required all interaction with him to take place in plenary sessions chaired by an official of the Ministry of Foreign Affairs. Dr. Ibrahim indicated it was his policy not to grant individual interviews and that all pertinent matters should be discussed in plenary sessions with all persons present.

Plenary sessions were conducted formally, and verbal interaction with MOH personnel was through the Chairman. The Chairman was fair and helpful, though formal, and served in a referee and mediator role. Plenary sessions took place each morning and afternoon from March 16 through March 21. Individual Ministry appointments permitted were to take place after a field visit. On several occasions, U.S. team members attempted to sit next to Nigerienne counterparts during plenary sessions, but the Project Director (Dr. Ibrahim) strongly discouraged changes in seating arrangements on his side of the room.

Though most members of the team had West African experience, none had served in Niger. We were thus at a disadvantage when, after preliminaries, the team was pressed, in plenary sessions, to accept an itinerary into territory unknown to us. We did not know at the time we agreed that we would be inflexibly locked into the sequence to which we agreed and that few changes would be permitted. Most changes that were later negotiated were with reluctance and resistance on the part of the Project Director.

To fully understand this set of circumstances, it needs be said that we were informed much later that the Minister would permit changes only on his approval. It was forbidden for the team to split up, although, on a few occasions, and in the same locality, this was permitted, but not without some ill feelings on the part of the Project Director.

Upon arrival in each Department, it was necessary for the team to first visit the Prefect and explain why we were there, and cabled or telephoned information concerning our visit was required for any changes in itinerary required or requested. Often we were required to visit the Prefect after visits as well for what was described as a courtesy call for debriefing. After each Departmental visit, the team was also expected to give a synthesis of our impressions before departure to the Health DDS and staff of the Department. Sub-Prefect visits were also required.

A problem for the U.S. team was that Nigerienne officials told us that they were not allowed to travel by air for this evaluation, and we would not be permitted to travel alone. The resolution of this impasse took the form of a 4,000 kilometers road trip during one of the hottest months of the year in Niger with 5 vehicles and 15 persons.

The U.S. team, with very few exceptions, was encouraged to ride with one another during the field visits. We were lodged in quarters separate and different from the Nigerienne team and interacted only at visit sites with a few social exceptions.

These details are reported to give a sense of the limits and constraints within which the evaluation was conducted. Because of these requirements, an unexpected additional 3 weeks in-country was required, fewer officials were seen than was planned, and such data as was made available required formal contact.

The team, despite the above strictures, is confident that figures and data made available represent data on which the government makes its own plans and decisions and is as accurate as is available. While we were not permitted to visit some places requested or to interview a number of health officials, the information provided was found internally consistent and was felt to represent the most reliable information available. Although our movement and program were limited and controlled, what we saw was representative, and the team did see 6 of the 7 departments of the country. The omission of the seventh was because the program there had been evaluated in June 1980 and there was no need for duplication.

#### 4.3 Objectives of the Evaluation

The main objective of the present evaluation was to assess the Rural Health Improvement Project mid-way through its 5-year term to assist USAID/Niger and the GON in making decisions concerning needed mid-course corrections and future of the project. A secondary purpose was to provide useful information and experience with an AID-assisted low-cost ru-

ral health system utilizing primarily unpaid volunteer Village Health Teams to Agency headquarters as well as for other interested individuals and groups and such as universities and other foreign aid agencies.

#### 4.31 Documentation of Progress

The Project Paper for the Rural Health Improvement Project is directed towards assisting the GON to strengthen and improve its rural health delivery system. In support of this intention, AID will provide grant funds amounting to \$14,029,000 over the life of the project (LOP). These funds will assist two essential areas of health programming: human resource development and institutional support.

A series of project inputs provided both by the GON and AID are specified in the Project Implementation Plan. Presuming that these inputs are provided at the proper time, rate, and amount, specified project outputs should be achieved. The degree to which the called-for inputs have been supplied and the outputs achieved are to be assessed. Since the project is only halfway through its scheduled life, definitive statements concerning the degree of achievement or success of project purpose can only be tentative at best.

#### 4.32 Identification of Problems

There are a variety of issues, problems and circumstances that make possible successful completion of AID-supported projects in less developed countries. These include, for example, project design per se, the degree to which the design is understood by all concerned, specifics agreed upon between AID and the host country, appropriateness and timely availability of project inputs, unplanned and unexpected efforts, particularly those which are undesirable.

The present evaluation identifies and analyzes problems impeding project progress which at mid-point, appear to be obstacles to achievement of the project's purpose.

#### 4.33 Specific Logistical Support Questions

In addition to more general objectives of the evaluation outlined above, several specific questions involving supplies of medications and materials, supply management, supervision, and frequency of immunization activities will be examined. Resupply of VHTs and evaluation of acceptance by villagers of the Ped-0-Jet as means of administering vaccines as contrasted with injection by needle and syringe will also be touched upon in this report.

Since medications and supplies are a vital part of any health delivery system, one of the team was specifically responsible for examining the ability of the ONPPC to procure and produce sufficient pharmaceuti-

cal supplies and to distribute those supplies in an efficient and timely manner. The object of this interest is to further insure adequate supplies in a potent state are being delivered to the 7 DDSs and to insure uninterrupted quantities of pharmaceuticals are available to meet growing demands created by continued expansion of the VHT network.

At the DDS, CM, and dispensary level, attempts were made to determine adequacy of inventory, product grouping, and to what extent the cold chain existed beyond the level of the DDS.

#### 4.34 Assessment of the Cold Chain System (La Chaîne de Froid)

The assessment of procurement procedures and the evaluation of vaccine transport (vehicles and garages), storage (freezers and refrigerators), handling (cold chests and reconstitution), and administration (conditions of Ped-O-Jets and sterile technique) were carried out so as to identify potential causes of vaccine failure.

The cold chain is the system for distribution of medicines and vaccines in a potent state from manufacturer to site of administration. When certain vaccines and medications are exposed to heat, they may lose their potency; once potency is lost, it cannot be restored, and these items are then useless. At that point, refrigeration cannot restore potency. Therefore, it follows that the importance of the cold chain cannot be over-emphasized.

An evaluation of the cold chain includes many factors, among them the following:

- a) procurement procedures
- b) procedures for clearing customs so that medications are not allowed to be exposed to excessive heat
- c) transport
- d) storage
- e) temperature monitoring
- f) back-up power systems in case of electrical failure
- g) inventory control
- h) maintenance and repair of freezers, refrigerators, and transport vehicles
- i) personnel training in vaccine handling and equipment maintenance and repair
- j) cost factors involved

The cold chain must not be broken at any level if vaccine potency is to be maintained. Therefore, it is important to examine these factors at each level: central, departmental, arrondissement, canton, and village.

#### 4.35 Formulation of Recommendations

The report of this evaluation will detail the project's status and will include a series of recommendations aimed at overcoming project

problems and deficiencies as well as building on project strengths in order to enhance and maximize project outcome.

#### 4.4 Methodology

Prior to departure from the U.S.A., the logistics and cold chain specialist held a series of formal and informal discussions with rural health delivery systems experts familiar with and involved in similar or related projects in West African nations and throughout the world. (See Appendix O for schedule of meetings at the Center for Disease Control, March 10-11, 1981).

Other team members reviewed the Project Paper, Health Sector Assessments and such other background information as was available prior to arrival Niger. After arrival, project documentation was supplied and files and reports were reviewed.

Before engaging in actual evaluation activities, several days of plenary discussions were held between the AID evaluation team and those designated by the GON to participate in the evaluation. An evaluation approach was agreed upon which, in general, follows the methodology for health program evaluation specified by the World Health Organization (1).

The WHO evaluation methodology was selected because it is comprehensive and does not contain particular country bias.

This evaluation methodology with respect to RHIP calls for the evaluation team to:

- 1) gain an understanding of the structure, functioning and resources of various levels and services of the existing health care system, and any planned changes;
- 2) obtain a clear picture of the present health status of the population in Niger, particularly those in the rural areas; and
- 3) evaluate the rural health project according to five criteria. These are:
  - a. Relevance: the degree to which rural health projects meet the basic health needs of the target population and is consistent with national health policies and health priorities.
  - b. Progress: make a comparison of actual accomplishments against scheduled targets and identify issues, problems and constraints and suggest how these problems may be overcome.

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(1) "Guiding Principles for the Managerial Process for National Health Development in Support of Strategies of Health for All by the Year 2000," WHO, Geneva, PDWG/REP/3, September, 1980.

- c. Efficiency: compare results in relation to expenditure of resources.
- d. Effectiveness: assess the degree to which the project is reducing health problems and improving health status, i.e. the attainment of objectives.
- e. Impact: ascertain or estimate the effect of the project on overall health development and related socio-economic development.

To carry out the evaluation, AID assembled a team consisting of an AID direct hire health delivery system specialist (team leader) and four consultants, a public health physician, a sanitary engineer, a public health economist, and a cold chain and logistics expert.

The Nigerienne team included the director of the Division of Health Establishments of the MOH, who has responsibility for the country's rural health system, and is RHIP Project Director. Other members of the Nigerienne team included a sanitary engineer, a health service administrator, a ministry functionary and a representative from the Ministry of Foreign Affairs.

#### 4.5 Review of GON, USAID and Other Health Data

To objectively evaluate a health program, there must be sufficient reliable, valid baseline data on which to make comparisons and determine the effect of project interventions on health status and end of project objectives. For programs such as the Niger rural health project where many levels of the health care system are involved, and a variety of activities are included (i.e., training, commodities, construction, etc.), considerable baseline information and follow-up data are required and necessary.

Sources for data which may indicate changes in health status include routinely collected health statistics and special information needed to answer specific questions regarding health status, relevant to the project.

At present, only rudimentary health statistics are available from the GON. There are, however, other GON data from which achievement of targets for human resource development, facility construction and commodity utilization can be assessed. These are discussed below.

Although the project paper calls for joint reviews of the project by the AID Health Officer and his Nigerienne Project Director to be held during years one, two and three of the project, so far as the present evaluation team has been able to determine, these reviews were not held, hence no specific data concerning health status were available from this potential source. The same may be said for the "full scale joint evaluation study" which was to take place at the end of the second year of the project. This joint study has yet to be carried out.

This does not imply that information useful to the evaluation team did not exist. The AID supported Health Sector Analysis and the Family Health Care report on the rural health system, both produced in 1977, provided valuable background material. Additionally, there was considerable information on health care activities and utilization of services available from the Ministry of Health documentation and reports. Such information as could be obtained in the time available to the evaluation team was utilized and coupled with site visits, discussions, meetings and interviews.

Raw data was also available in the Ministry, but in unaggregated and unanalyzed form. A DES official attempted to analyze data in order to fill in a matrix developed and provided by the U.S. team, but was able to assemble only about 5% of the information requested during the time the U.S. team had available to it in Niger.

## CHAPTER 5.0 FINDINGS AND ANALYSIS

### 5.1 Introduction

The framework for analysis of the Rural Health Improvement Project is based on the following model:

First: Health problems were identified and placed in an order of priority. A scope of the health services and products necessary and adequate to cope with the problems identified was specified, and organized into a health care delivery system. To promote the appropriate use of the systems, educational activities are necessary.

Analysis at this level was concerned with: (1) adequacy of the data system to diagnose and quantify problems and to indicate changes over time, (2) whether the scope of goods (e.g., drugs) and services and the delivery system were appropriate for Niger, recognizing the physical, socio-cultural, political, legal and institutional, technological, and economic environment.

Second: In order to provide services and products at the right place and time and in appropriate numbers, health workers and support staff and various kinds of facilities, supplies, and equipment must be provided. These must be backed up with transport, communications, maintenance, and logistical systems.

Analysis here was concerned with the appropriateness of design, construction, and use of facilities and equipment, the extent to which staff were in place and functioned to produce the necessary services, and the degree to which the system was able to respond to needs. Of particular importance to this evaluation was how commodities and equipment are being made available when and where they are required, and whether they arrive in timely fashion.

Third: Human resources were evaluated. Here we were concerned with projections of staff needs over time, training and staff development and establishment of training programs to meet projected needs, and evaluation of performance and supervision.

Fourth: Financial functions were assessed. The source and use of funds were examined, both for RHIP capital expenditures and for the operation and maintenance of rural health system. Here we also looked at expenditure controls and mechanism for ensuring that GON financial practices are sufficiently responsive to donor country needs so that donor funds are made available in a smooth and timely manner.

In the report of findings and analysis, the evaluation team was concerned primarily with Niger's rural health program. Only where institutions, agencies, and other organizations work with or have significant impact or influence on the effectiveness or the efficiency of the rural health program were they included in the evaluation.

The sections of this chapter which follow deal with various aspects of health problem assessment and system design, production of health care services, human resources, and financial aspects of the project.

## 5.2 Rural Health Services

The rural health care system in Niger is pyramidal in structure. At the base are approximately 8,300-8,700 villages, less than half of which have Village Health Teams.

Next is the canton level. Here are found the lowest level of fixed facilities - the rural dispensary serving 10,000 people on the average. As of December, 1980, there 213 rural dispensaries.

At the arrondissement level are found medical centers or CM's (circonscription medicale). These presently number 38 and provide general hospital and maternity care, ambulatory medical care, and some preventive services.

Health care at the canton and arrondissement levels is the responsibility of each Departmental Director of Health (DDS). The overall director of the village health system country-wide is the Director of the Division of Health Facilities (DES) in the Ministry of Health. He also has responsibility for Niger's hospital facilities and is RHIP Project Director.

### 5.21 Health Services at the Village Level

The Village Health Team as a concept in Niger has been in operation for over 15 years but has had major expansion only in the past 3 or 4 years. The Nigerienne concept of primary health care is based on voluntary involvement of the communities supported with varying degrees of administrative, technical, and logistical back-up, and a referral mechanism to higher level health care services and facilities. In those villages where health teams have not been established, traditional birth attendants and indigenous healers provide for immediate health needs as best they can.

Both villages with and without health teams are served by mobile vaccination teams and by the PMI. However, in villages with health teams, there is greater health awareness as well as resident health workers, albeit at a very low level. There is supervision from the dispensary and arrondissement levels, thus there is a possibility for continuity of care to be developed in these villages whereas this is not possible in villages without Village Health Teams.

The level of care provided by securistes is quite rudimentary. Their chief usefulness is to provide some education concerning common health problems and sanitation, to assist in the prevention and treatment of malaria, and to give simple treatment for common and elementary

diseases and injuries. Measles and diarrhea are health problems with major morbidity and mortality that are not dealt with as they could be at village level, given the existing system. Although sufficient measles immunization theoretically has been given to protect most Nigerienne children, there is no objective evidence to show that incidence of the disease has been affected. The problem apparently lies in the administration of the vaccine program, and this is addressed elsewhere in this report.

With respect to diarrhea, two important improvements could be instituted within the framework of the Village Health Team system. First would be to increase awareness of the causes and prevention of diarrhea (few securistes or matrones interviewed by the evaluation team gave evidence that they knew the causes and prevention). The second would be to employ oral rehydration therapy.

Oral rehydration salts, as provided by UNICEF, reportedly are used in pediatric wards in some of the larger hospitals, but none were in use at any facility seen by the evaluation team. In Dosso Department, "a pinch of salt and sugar" added to water is used by some securistes, and the DDS there is pushing to expand this therapy. While a step forward, the "pinch and scoop" approach to oral rehydration is not adequate to cope with severe diarrhea, as recent field studies reported in reputable journals have shown.

According to Dr. John Wright, WHO Country Representative in Niger, initiation of the WHO diarrheal disease control program will be considered by the MOH later this year.

Toward the end of the team's 2-week field visit, and perhaps in response to the team's interest in diarrheal disease control, the Project Director went on record as having interest in oral rehydration therapy and a desire to explore how such treatment might be added to VHTs' activities with donor support.

Securistes are supplied with a kit containing drugs, bandages, and other supplies, with replenishment to take place during supervisory visits from the dispensary nurse, but it was not common to find securistes with fully-supplied boxes.

Anti-malarial drugs were usually available, as were aspirin, powdered charcoal, and an enteric sulfonamide preparation. Bandages, aureomycin eye ointment, methylene blue (for mouthwash), and mercurochrome were the items most often exhausted. Lack of logistical support by dispensary nurses for VHTs, not availability of drugs, was the problem. ONPPC is not responsible for getting drugs to village health workers.

Handling of pregnancy and childbirth at the village level by matrones was difficult to assess because of the absence of data. According to Dr. Bako Caouda, DDS for the Department of Zinder and a trained obstetrician, an alert matrone with the routine 10-days' training can capably deal with the 95% of normal deliveries and can recognize and refer the 5% of deliveries with problems. It was Dr. Bako's impression that infant and maternal mortality have dropped in villages since health

teams have been fielded and, further, that there is greater referral of problem cases to hospitals from these villages.

In the National Hospital in Zinder, which accepts only complicated maternity cases, Dr. Bako estimates a maternal death rate as high as 10%. Deficiencies throughout the health care system, including a rather primitive level of hospital care in Zinder, accounts for this high maternal death rate. In hospitals accepting normal as well as problem deliveries, the maternal death rate is said to be much lower.

Both securistes and matrones are charged with responsibility for nutritional education. However, it is matrones, in practice, who provide much of this activity, assisted by dispensary nurses, occasional visits from PMI personnel (mainly for training) and also by Peace Corps nutritional aids. The treatment of diarrhea, even in infants, falls to the securistes.

Although the PP calls for educational material to be provided for VHTs, the team saw little evidence of it.

As a policy, the GON has indicated that all of its citizens are treated equally with respect to health services. No special arrangements are made to deal with nomads who are less likely to have access to fixed health facilities than are those residing in secondary villages. As a result, nomads seem to be more self-sufficient. In the few encampments visited, the evaluation team was impressed with a greater degree of community involvement in health matters by nomads than was seen in settlements.

In analyzing health care activities and effectiveness of the Village Health Team, it must be realized that the vast majority of Nigerienne villagers are illiterate and have had little or no formal education. Add to this a brief training period for the VHT (10 days), limited retraining, inadequate supervision, and meager financial resources for health and the question arises - how much can be expected from the system? An equally important question is whether there are alternatives which would be more cost-effective, feasible, and affordable, taking into account the Nigerienne reality.

The village health system does meet some felt needs. It is supported at all socio-political levels and is community based. In general, the system seems accepted by the villagers and the teams alike.

People in villages with VHTs, according to the DDSs, are more health conscious, demanding more health services, and are carrying out more healthful practices. There is greater referral activity up the chain from VHT villages.

Despite a present lack of objective evidence of effectiveness, based on activities undertaken and services provided, observations of the present evaluation team, indicate the VHT system is working. Furthermore, as the system is expanded, refined, and developed, and as other higher level health care activities are expended and strengthened, there is every reason to believe an effective rural health service should be realized.

How long it will take to expand the VHT system for full coverage of the country is still a question. Many factors are involved including continued acceptance by the communities themselves. The degree of village participation and commitment varies, and this factor plays a large role in the level of utilization and effectiveness of the system. The team was particularly impressed with community support evidenced in several villages in Agadez Department.

How matrones and securistes are selected and supported influences their acceptance by the village and their performance. It also bears on their job satisfaction which is critically important to their staying on the job. Overall, securistes' attrition rate is fairly high about 10% the first year. After the third year, few securistes leave. Matrones have a lower attrition rate than do securistes. Frequency of supervision and retraining bear on VHT attrition, as do job opportunities. Securistes are volunteers.

At the end of 1978, shortly after the beginning of the RHIP, the MOH reported a total of 2,014 securistes, 1,918 matrones, covering 1,655 villages (of a total of 8,750, or 19% coverage). However, not all villages had the desired complement of 2 matrones and 2 securistes.

From December, 1978, to December, 1980, substantial growth in the VHT system took place. 3,335 securistes, an increase of 60% in 2 years; 3,225 matrones, also up 60% in this year; and 2,283 villages of 8,312 total, for a coverage rate of 27.5% of villages.

Targets for the health sector component of the 5-year National Development Plan, covering years 1979 through 1983, are for an additional 2,500 villages to have VHTs. Of these, 800 are targeted for Zinder Department. To date, Niamey and Dosso Departments have the highest percent of villages with VHTs, relative to their populations. Between 1978 and 1980, the number of new VHT-covered villages rose by 628. Village Health Team development can only proceed as fast as expansion occurs in VHT training capability and as new dispensaries are created which can supervise them.

## 5.22 Rural Dispensaries

Rural dispensaries play a key role in Niger's rural health system, and, as time goes on, their importance will increase.

Staffed by certified nurses, the dispensary is the lowest level at which health care is provided by literate, trained health workers. It also serves as immediate back-up for supplies and supervision for Village Health Teams. Dispensaries, in turn, are supervised by more highly trained state nurses from the arrondissement level and by other personnel from the DDS's office.

Dispensaries handle a patient load of approximately 75 to 100 people each day, serve a population of about 10,000, and supervise an average

of 10 Village Health Teams. The number of villages supervised by dispensaries visited by the evaluation team ranged from 7 to 17.

The standard list of dispensary equipment calls for a medical weighing scale, tables for examining patients, simple instruments such as clamps and scissors, blood pressure cuff and stethoscope, syringes, needles, and supplies. A portable gas stove is also standard equipment. There are trays in which to boil needles and syringes.

A metal cabinet is provided for storing drugs, bandages, and other supplies. Some dispensaries have refrigerators, but few of those inspected were in working order.

In the opinion of the physician member of the evaluation team, medications available to the certified nurse permit care of wide variety of common medical problems. Medications included several broad-spectrum antibiotics, an injectable potent diuretic, analgesics, tranquilizers, etc. In general, drugs were in date. Bandages were packaged appropriately for convenient use.

Depending upon the commitment and competence of the certified nurse, the amount of clerical and other assistance available, and the amount of drugs and supplies, a significant amount of general curative health care can be provided at the dispensary level.

The fact is that the level of care is very uneven. Most care given is for symptomatic treatment of complaints. The amount of time the nurse has with each patient is limited because of large patient loads and required record keeping. Records in general seemed to be extensive and presumably reflected the patient volume fairly accurately and gave some idea of the health problem mix.

The technique of maintaining sterility of needles and syringes (boiled in covered trays) almost ensures contamination of tray contents. Forceps are used to remove items from the boiled water bath. These forceps were seen placed on non-sterile items such as used syringes or lying on tables. In some instances, forceps handles were delicately balanced on the edge of the tray with the forceps points in the water bath. The forceps fell into the basin when an attempt was made to grab the handle. Non-sterile instruments were then used to remove the forceps.

The fact that sterile technique has broken down was confirmed by a physician-Adjoint DDS who reported seeing abscesses at injection sites not infrequently. Undoubtedly, some abscesses could be so-called "cold abscesses" due to the injection material itself. By far the greater number, however, are likely due to contaminated needles and syringes.

Although one dispensary had a UNICEF-supplied microscope and the nurse did gram stains and stains for tuberculosis testing, the great majority of dispensaries seen had little or no diagnostic test capability.

Dispensary nurses have no suturing experience and do not surgically repair small wounds.

Preventive services of the dispensary, provided by the certified nurse, are limited to guidance on feeding of infants and general healthful practices, including use of anti-malarials to prevent and treat malaria. In addition, the PMI service provides MCH and other services in over half the dispensaries. No immunizations are given at the dispensary unless the facility is used by the Grandes Endemies organization.

Perhaps the greatest impact the dispensary nurse can have for disease prevention is at the village level. Here, he has the opportunity to instruct and supervise Village Health Teams in preventive and promotive health care activities, including personal and village sanitation. Unfortunately, in practice, supervision provided by the certified nurse is of low caliber, brief, infrequent, and more for inspection than supportive supervision.

Training of certified nurses is discussed elsewhere in this report. Suffice to say, a one-year course has proven inadequate, and training, as of 1981, will be increased to 2 years. The additional year's training is to include more practical experience and will also stress supervisory activities. In this way, it is hoped that certified nurses will be better able to run their dispensaries and supervise VHTs.

Earlier it was stated that dispensaries are to assume increasing importance in the Nigerienne rural health system in the future. Beginning in 1977, construction began on a new style dispensary. These are permanent, fairly solid buildings constructed of cement block, containing ample living quarters for the nurse and his family as part of the facility. The dispensary section has a number of treatment rooms and includes a "holding room" with a bed to care for patients requiring observation. A generator for power and latrines are to be included as part of the dispensary. In some locations, the dispensary will be part of a complex of other community facilities. Team findings on building construction are detailed in a subsequent section.

In the period from 1977 through 1983, 121 of these new dispensaries are programmed to be built. Of these, 7 are to be funded by the RHIP. At the end of 1978, the MOH reported 156 dispensaries placed, and, at the end of 1980, 213 dispensaries. This suggests that 56 new dispensaries were built in the previous 2-year period and suggests that the present Five-Year Plan target for dispensary construction very likely will be achieved.

The concept behind the dispensaries being built is that they will serve as key facilities for definitive preventive, promotive, and curative care for the rural population. By building substantial structures, providing water and electricity, and quarters for the nurse, it is hoped that the level of care will improve and that the public will have increasing confidence on the health services. In time, as villages become saturated with VHTs, secouristes will be assigned to assist nurses in the dispensary, some on a permanent basis and others on rotation, so as to get additional skills and supervision. Ultimately, the goal should be to base more and more immunization and other preventive services at the dispensary level.

Listed in the MOH compilation of facilities in 1980 were 24 Postes Medicaux. These are small, rural facilities, but none were seen by the evaluation team.

### 5.23 Arrondissement Medical Centers

The next higher level of the rural health system is the arrondissement medical center (CM); there are 38 CMs. These usually consist of a dispensary, a maternity ward containing about 10-12 beds, a general hospital ward of 18-20 beds, and a PMI. Each center is directed by a state licensed nurse assisted by 2-3 certified nurses, several laborers, and one or more drivers. Maternity and PMI activities are directed by a state-trained midwife (Sage Femme).

CMs have no X-ray facilities and have limited laboratory capability - usually urinalysis, smears, and possibly blood counts. CM pharmacies have a more sophisticated range of drugs than are available at dispensary level.

The CM is vital to the rural health system since it trains Village Health Teams, supervises dispensaries, and receives referrals from dispensaries. Supervision of the CM is provided by the DDS and his staff. Supervisory visits are made monthly.

The evaluation team visited CMs in all departments except Diffa. They were generally found to be poorly maintained physically; Dosso was an exception. Maternity facilities seemed adequate but most hospital care consisted of beds or mats, the giving of medication, occasional intravenous fluids, but little nursing care. The CM at Tillabery seemed larger than many and is somewhat unique in that a travelling surgical team periodically visits the CM and performs relatively simple surgery - hernias (under spinal anesthesia), hydroceles, etc.

Considerable preventive medicine is practiced at the CM, primarily as a result of PMI activities. When vaccines are available, some immunization has been established at the CM level, and the great majority of these services are provided through the Division of Hygiene and Mobile Medicine. Consumers desiring immunizations at CMs have the option of buying vaccine at the pharmacy and having it injected, free of charge.

### 5.24 Division of Hygiene and Mobile Medicine (DHMM) and Immunization Services

The primary activity of the DHMM is to conduct mass immunization programs. Symptomatic medical treatment is also offered by mobile teams while they are in a village. Schedules are planned in advance but are not disseminated through the political system, which would insure a much higher participation rate. In addition to failure to disseminate mobile team schedules, other factors also come into play that have a negative effect on numbers of immunizations given by these teams. Schedules are

often broken as a result of epidemics, malfunctioning Ped-0-Jets, and vehicle problems. These will be discussed in depth in other sections of this report. Within the past month, the Departments of Maradi and Zinder have opened a dialogue at the Prefect level in an attempt to improve village participation.

In addition to offering immunizations at village level, mobile teams are also available for school-based immunization programs as well as at the PMIs.

Almost all immunizations are administered by use of the Ped-0-Jet. Exceptions are tetanus toxoid, given to pregnant women by needle and syringe, and smallpox vaccine which is administered with the bifurcated needle. Immunizations are given in accordance with the following age recommendations:

Measles: 3 months to 6 years; this schedule was changed during the first week of April, 1981, to 3 months to 4 years of age. It was the opinion of the team that this change may not have much impact on the number of immunizations given since, in practice, mobile teams consider the date they last visited a village before determining the age cut-offs.

Polio and DPT: A series of 3 monthly injections theoretically commences at 4 months and boosters are given by means of school-based programs. Since mobile teams are limited in their ability to reach villages more frequently than every 3-4 years, some children may be over 4 years old before they have the opportunity to be immunized.

BCG: One week (required by the schools).

Meningitis: 1 year to 15 years, based on epidemiology surveillance indications.

DT: 7 years and up.

Smallpox: 1 month and up. A large supply of vaccine was purchased prior to the announcement of certification and smallpox eradication. When supplies are exhausted, DHMM intends to discontinue use. The RHIP should encourage the DHMM through the Ministry to urge all DDSs to destroy all smallpox vaccines still on hand, as soon as possible. There is little benefit or utility to waste scarce health resources, personnel, equipment, and transport and money to vaccinate against smallpox in a country certified free from smallpox in 1977-78.

Table 4 lists the number of vaccinations given over the past 4 years; the great majority were administered by DHMM. Figures are not easily related, however, to extent of coverage or to effectiveness of the vaccinations. In the field, the evaluation team learned that, because of limited staff, transport, and vaccines, most arrondissements are visited by DHMM teams, on the average only once every 4 to 5 years. Since perhaps only 10% of immunizations are given at the PMI, it is clear that the majority of children are not receiving immunizations when

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Table 4

Vaccine Administered by DHMM in 1977 and 1978  
and by  
DHMM and Others in 1979 to 1980

<u>Vaccine</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>
Measles	448,746	335,473	277,892	374,368
Polio, Oral	49,980	39,139	22,436	126,260 (injectable)
DTcoq & Oral Polio	4,541	45,095	21,031	56,417
DTcoq	147,308	6,317	9,619	8,924
DT	13,636	0	183,229	0
BCG	238,818	99,371	142,324	116,135
Meningitis	0	13,790	156,477	578,841
Cholera	10,666	250,598	304,417	257,985
Yellow Fever	0	0	49,608	233,627
Smallpox	815,996(?)	291,497	321,167	217,960

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they are most vulnerable. For example, measles vaccine is given any time from 6 months to 6 years. The situation with pregnant women with respect to protection against tetanus is very bad, with only a small percent protected.

The evaluation team made a number efforts, all unsuccessful, to meet with the director of DHMM to verify field observations and to obtain information on coverage. The former RHIP Project Officer, when queried, replied only that in the 3 years that he was in Niger, he was never able to meet with the DHMM Director - not even once. The team was most curious about this circumstance.

#### 5.25 Maternal and Child Health Services

DAS/PMI provides prenatal care, deliveries, postnatal care, an infant nutrition program including education, demonstrations, and care of the malnourished, and social services aimed at strengthening the family.

PMIs are staffed by trained midwives, nurses, and social assistants who direct the health and nutritional activities and provide education for women (sewing, literacy, etc.).

The DAS/PMI service has been quite successful in extending services to pregnant women and both sick and well children. The goal is to provide PMI services in all dispensaries, and this is well on the way to being achieved.

The physician member of the evaluation team was impressed with the PMI - its commitment, spirit, and goal achievement orientation. Well designed and quite complete forms were used to record health and consultation data for each individual served. These records were seen in all dispensaries and CMs. In addition, mothers were provided with a "carnet de sante" for each child. This is an adaptation of the widely-used Morley growth chart which records vital health-related information on each child and gives clear indication of growth progress.

The team felt that DAS/PMI could well serve as a model for countries at similar levels of development.

#### 5.26 Hospital Services

This evaluation was concerned with hospitals only insofar as they related to rural health care. Visits were made to the National Hospitals in Niamey and Zinder, and to Departmental Hospitals in Agadez, Dosso, Maradi, and Tahoua.

The government of Niger has consciously spent the major share of its funds for rural health services. This is rare but commendable. At most, only 10% of health problems require hospital care, including deliveries, and only 2% require specialized care.

As a result of giving priority to rural health care, hospital facilities are in poor condition and services are poorly developed and in general quite primitive. Only the most basic diagnostic x-ray and laboratory procedures are available, and these are not done with much frequency, relative to patient load. The staff-to-bed ration is very low and the level of nursing care is generally also very low.

Because there are so few Nigerienne physicians, the majority of medical staff in hospitals are expatriates. This situation is likely to remain until the country's young medical school starts to produce a steady stream of new physicians who can serve in clinical as well as in administrative roles. The small number of Nigerienne physicians have mostly been moved into administrative positions.

The above comments are in no way critical; they express reality. Over time, as the rural health system is developed, hospital facilities and services can be upgraded. For the present, health care resources are best spent as they are. The team applauds the determination of Niger to concentrate on the base of the health pyramid. Many countries give lip service to strengthening the base, but in reality concentrate their spending on the apex. Niger was found to be a welcome departure from this practice.

#### 5.27 The National Office for Pharmaceutical Products and Chemicals (ONPPC)

ONPPC, a semi-governmental cooperation, in contrast to other health-related facilities or services in Niger, is a modern, well-housed and

equipped pharmaceutical establishment. About 200-300 different chemical drug products are stocked, and these are made available in some 3,000 product presentations.

ONPPC has the developed capability to manufacture commonly-used parenteral fluids and to formulate a number of drugs, including chloroquine. It also repackages drugs bought in bulk into appropriately-sized, low-cost packages for distribution.

Drugs are stored in clean, cooled warehouses. Careful attention is paid to inventory (controlled by computer) and to expiration dates for dated items.

There are good laboratory facilities, nearly complete, to test the quality of many drugs and to test food and water quality (no bacteriology, however).

ONPPC receives orders from CMs and dispensaries, channeled through the DDS, every 4 months. Orders are drop-shipped to arrondissements and then distributed to dispensaries.

The ONPPC formulary contains essentially all drugs required to meet the majority of health care needs of the population. Drugs not available are special chemotherapeutic agents for neoplasms or preparations used for certain diagnostic tests.

The importance of ONPPC to health care in Niger stems from the excellence of its organization and the fact that a national formulary of effective and appropriate drugs is available. This is one of the important building blocks on which to develop the health care system. ONPPC and Niger have lessons to teach other countries in the region on procurement, supply, control, inventory, and distribution of medications in a low-cost, national, public-sector health system. We have much praise for ONPPC. It has been well earned.

### 5.3 Rural Water Supply

#### 5.31 GON Policy for Rural Water Supply

The GON has adopted a policy of providing each rural settlement of at least 200 inhabitants with a modern water source. In certain cases, exceptions are made. For example, where settlements of at least 100 persons must travel over 5 km. for water, the policy is to install a water point. Target yield for modern wells is from 25 to 30 liters per day per persons for areas served by a modern well and 5 liters per person per day for those areas which are arid and with little water.

Large-diameter hand dug wells have priority over bored wells due to a need to limit influx of large numbers of livestock which would result in destruction of surrounding pasture lands. Where hand dug wells are not a practicable solution, a bore hole with manual pump will be pro-

vided. At depths greater than 80 meters, GON policy is to equip a well with an electric pump only as a last resort, because of high capital costs and equally high recurring costs for operation and maintenance.

## 5.32 GON Organization for Rural Water Supply

### 5.321 Ministry of Hydraulics

The Ministry of Hydraulics, created in June, 1980, is responsible for the execution of government policies in water supply in urban and rural centers, the inventory of water resources, and planning and exploitation of water resources. This Ministry likewise has a role as coordinator with other agencies and organizations.

Following the planning and financial cycle established by the Ministry of Plan, the Ministry of Hydraulics coordinates with the Ministry of Interior (for villages) and the Ministry of Rural Development (for pastoral zones) and establishes lists of villages and their priority for construction of water resources.

An office has been created under the Ministry of Hydraulics called Office des Eaux du Sous-Sol (OFEDES) which is charged with: drilling or digging and equipping of wells in urban as well as in pastoral or rural zones, the operation and maintenance of wells and bore-holes situated in rural and pastoral zones, realization of water distribution networks in secondary centers, and operation of pumping stations in pastoral and rural zones as well as fiscal management of water supply systems in secondary centers. The Ministry of Hydraulics (MH) also has the capability to drill bore-holes in addition to capabilities of OFEDES.

A second office under the Ministry of Hydraulics, NIGELEC-EAU, is given responsibility for management, operation, and maintenance of water supply services in an urban center once the center has an electrical supply. The state provides all installations and equipment, revolving funds and remuneration, and in return receives all profits from the operation or is responsible for covering any deficits occurring from the operation.

### 5.322 Ministry of Public Works

All civil construction works undertaken by the government must be executed by the Ministry of Public works even if eventually contracted to the private sector. The Ministry of Public Works has the capability to construct and equip bore-holes in support of its projects.

### 5.323 Ministry of Public Health and Social Assistance

Although the Ministry of Public Health and Social Assistance (MPH/

MON) does not play an active role in the realization of water supply facilities, they most definitely have a role with regard to the quality and quantity of water as it affects public health.

### 5.33 Current Status of Rural Water Supplies

It is currently estimated that water supply needs of the rural sector are only 32% covered with adequate water sources. That part of the population not covered takes water from rivers, swamps, ponds, traditional wells, or other sources.

Out of a total of 6,012 modern water points (concrete wells or bore-holes) existing as of December 31, 1980, 724 were constructed in 1980. The following list represents an estimation of satisfaction of current demands in the rural sectors by Department.

Diffa	29%
Dosso	41%
Maradi	30%
Niamey	36%
Tahoua	41%
Zinder	19%

No figures were available from the Department of Agadez.

At present (1981), 391 wells and 5 bore-holes are under construction in Niger.

### 5.34 Current GON Planning for Rural Water Supply

The GON is committed to the goals of the UN International Water and Sanitation Decade to provide sufficient safe water to the population by 1990 at a minimum level of 25 liters per person per day. This undertaking will require the construction of 2,000 sources per year over the 10-year period in order to cover the estimated 25,000 villages and settlements existing in the country.

During the First National Workshop on the UN Decade held in Niamey from February 16 to 21, 1981, the GON proposed that the decade be divided into 3 stages of development as follows:

<u>Period</u>	<u>Water Sources Required</u>	<u>1980 Estimated Cost (CFA)</u>
1981-1983	3,193	12,400 billion (*1)
1983-1986	2,550 (plans prepared)	10,500 " (*2)
	4,000 (to be identified)	16,000 " (*2)
	Miscellaneous studies	3,180 " (*2)
1986-1990	6,000	24,000 "
	Improvements to existing wells	6,360 "

Total	15,743	72,440	"
	+20%	14,488	"
		<hr/>	
		86,928	billion

- (\*1) Financing assured
- (\*2) Financing to be obtained

The program for the period 1981-1983 is currently described in the Quinquennial Plan (1979-1983) which calls for the construction of 3,589 water sources, of which 396 are currently under construction. Funding is currently assured for sources to be developed for the period from 1981-1983.

As for the overall program to the year 1990, the GON expects to finance 15% of the investments required as well as to continue participation in the maintenance of these facilities. External funds required to support the program and obtain the goals of the UN Decade for Niger for water supply amount to 74 billion francs CFA (about U.S. \$352 million).

During the First National Workshop, the following constraints were identified:

- lack of a national water policy
- insufficient personnel in GON properly trained
- lack of funds on a regular and adequate basis
- insufficient coordination of this subsector

The workshop also identified the following special studies would be required in order to assist in realization of the goals of the UN Decade:

- a water resources inventory
- a study of local fabrication of hydraulic materials and equipment (water pumps, pipes, etc.)
- a study of water resources between Niger and Upper Volta
- a study on creation of a National Water Analysis laboratory
- a study on sediment transport for the principal water courses of the country
- an inventory and informational study on aspects of daily water use in the Republic of Niger

### 5.35 Relationship of the RHIP to Rural Water Supply

One of the integral components of the rural development effort of the GON is providing an adequate supply of clean water for animal and human consumption. In support of improved health services, the RHIP recognized the vital role that adequate safe water sources and their proper use plays in maintenance of health in the rural environment. Training in provision of bacteria and parasite-free potable water was to be emphasized through:

- broadcast and print media
- public schools
- ENSP (School of Public Health)
- ENICAS (Certified Nurse Training School)
- VHT training program
- Animation Rurale

In addition, the RHIP currently provides support to rural sanitation efforts through training of sanitary engineers, sanitary technicians, and sanitary aides who will function as part of the newly-created (1975) National Hygiene and Sanitation Service. Further discussion of this service follows in Section 5.7.

The RHIP plans to further assure adequate water supplies and support facilities are constructed and/or renovated in DDS headquarters centers at Agadez and Zinder, in 7 new dispensaries, and through environmental sanitation improvements at existing dispensaries and health centers.

The project is likewise furnishing water filters of 311 and 622-liter volume to public buildings such as schools, CMS, dispensaries, prefectures, etc.

#### 5.36 Field Observations

For rural populations (5,000 and under), there are several traditional sources of water which consist of rivers, swamps, ponds, and traditional wells. The traditional wells are hand-dug, often with free-standing dirt walls. In some instances, the walls are reinforced with logs. In no case are these wells provided with covers. Traditional wells appear not to exceed 50 meters in depth. Water is drawn by hand in leather buckets or pouches. In all traditional wells examined, the water drawn appeared turbid and was not of acceptable quality.

Water drawn from the rivers, ponds, and swamps was subject to contamination from human and animal wastes, washing of clothes, and slaughter of animals. In addition, infection rates for schistosomiasis in some areas of still water (such as the lake of Tabalak) are reported to be as high as 90% of the population.

Where the GON has installed reinforced concrete-lined wells, the situation is slightly improved although these wells, for the most part, must be considered as contaminated as traditional wells due to the use of animal traction to retrieve water. Where the well is 10 meters or deeper, the rope which raises the bucket touches the ground and entrains sand and animal excreta into the well opening when the bucket is lowered.

Reinforced concrete wells are built by OFEDES with a standard inside diameter of 180 cm. with the bottom 4 meters consisting of a concrete well screen with an inside diameter of 140 cm. The wells are raised about 30 cm. above the ground surface and are not provided with any type of cover. There is an attempt to slope the ground away from the well. At

some older wells, a concrete apron had been provided; however, this not currently the practice on new well construction by OFEDES.

In the arrondissement of Mayahi in the Department of Maradi, the French-sponsored Volunteers for Progress have been installing wells with an apron extending 180 cm from the edge of the well. The water, still raised by animal traction, is poured into a receiving basin at the edge of the apron where it flows by gravity through a PVC pipe encased in concrete to a watering trough for animals. The total distance of the trough from the well is about 5 meters. A fence is provided around the well to limit livestock access to the watering trough. In an attempt to clean the rope prior to its re-entry into the well, it is dragged across a plank located at the fence where vibrations remove some of the mud and excreta. However, this has not proved to be a satisfactory solution to the problem.

In some areas of the Department of Dosso, the local population has prohibited access of the livestock to the area adjacent to the well by constructing a fence. This was not noted in any other areas visited.

Studies undertaken by Hydraulique Pastorale BCEOM-IEMVT indicate that a complete cycle using traction to lift 50 liters of water takes approximately 8 minutes for an 80-meter-deep well and 6 minutes for a 40-meter-deep well, with about 3 minutes of total time being required to handle the water on the surface.

In an area above the city of Agadez, irrigated gardens were observed which used a unique system for raising water from traditional wells using animal traction without human handling of the water buckets. The first distinguishing characteristic was in the construction of the water rack or leather bucket used in the well. Being of traditional shape, it had an opening at the bottom where a cylinder of leather was sewn. A rope was attached to the free end for use as shown in Figure 1.

The second distinguishing feature was in the construction of an "A" frame above, and the use of 2 pulleys to lift the leather bucket to a point where the attached leather cylinder could spill its contents into a trough. Figure 2 shows this pulley system and its operation.

The water coming from this type of well (approximately 6 meters deep) was clear despite the well not being covered.

Only one type of manual pump was observed by the evaluation team during its mission. In the Department at Niamey, several new well installations were observed which used the Verguet 40-foot pump constructed by Ets. Pierre Mengin of France. The pump installation is mounted on a concrete block of one meter square and about 20 cm. high. Concrete aprons were provided at only 2 installations out of eight observed. The drainage of waste water away from each well appears to be a problem. Each foot pump will deliver 10 liters of water per minute. Accordingly, the number of wells installed appeared inadequate for the demands of the village. For example, in the village of Bouza, there are 3 foot-pump wells installed for a reported population of 2,500 persons. Based on the GON criteria of 25 liters per person, these wells cannot

meet daily demands. The villagers indicated that they continued to frequent traditional water sources to supplement water drawn from the new wells. The average depth of the wells could not be determined, but observation of a hand-dug well at Bouza indicated a water table about 5 meters below ground surface.

It is understood that UNICEF has been installing hand pumps on shallow wells (up to 30 meters) of the Mark II type. No observations were made due to limited time available for field visits.

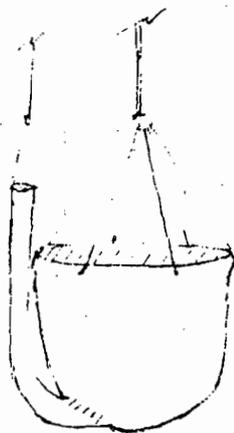
With regard to water filters funded by RHIP and constructed and placed in operation in the Department of Niamey, this program cannot be considered as successful. These filters, constructed of aluminum, use a mixed-media filter consisting of, from the bottom, gravel (5 to 8 cm.) for 80 mm. depth, sand (0.2-0.3 mm.) for 340 mm., charcoal (10 to 20 mm.) for 150 mm., and gravel (20-30 mm.) for 100 mm. The filters are one meter in height and 636 mm in diameter. Two valves, one located on the side and the other on the bottom, permit filtered water to be drawn while the filter is being filled through a removable top cover. A government inspection in June, 1979, found 31% of the 64 filters inspected were not operating in a satisfactory manner. The team observed that 57% of the 7 filters inspected were not functioning, mainly due to broken valves.

The 7 dispensaries being financed by the project are being built without adequate water supplies. Although all plumbing has been installed, the government does not plan to install a bore-hole with manual or electrical pumping. There will be an open, reinforced-concrete well on the grounds. There is no timetable for construction of the wells. The team was informed that the well construction had been incorporated into the OFEDES program. Thus, at these dispensaries, water will be hand-drawn at some distance, carried to a small ground level reservoir, then pumped by hand to an overhead tank (one cubic meter) where it will flow by gravity to the dispensary plumbing. It is highly unlikely that this system will be used as the laborer will carry the water directly to the point of consumption or use to save work. With inadequate amounts of water being used, the sewage system of these dispensaries may be expected to malfunction in relatively short order.

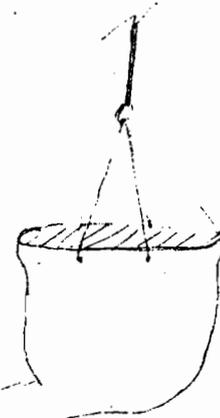
## 5.4 Rural Sanitation

### 5.41 Introduction

The typical rural village in Niger consists of individual family units grouped around a central courtyard. Homes are constructed of straw on a wood frame or mud bricks reinforced with straw (banco). Straw construction is found primarily in the Southern area of the country (Departments of Niamey, Dosso, Maradi, and Zinder) while mud brick construction is found in all parts of the country but predominates in Northern populated areas.



Position of leather bucket when lifting water



Position of leather bucket when emptying contents

FIGURE 1- Leather buckets of the type used in wells serving irrigated gardens in the area of Agadez.

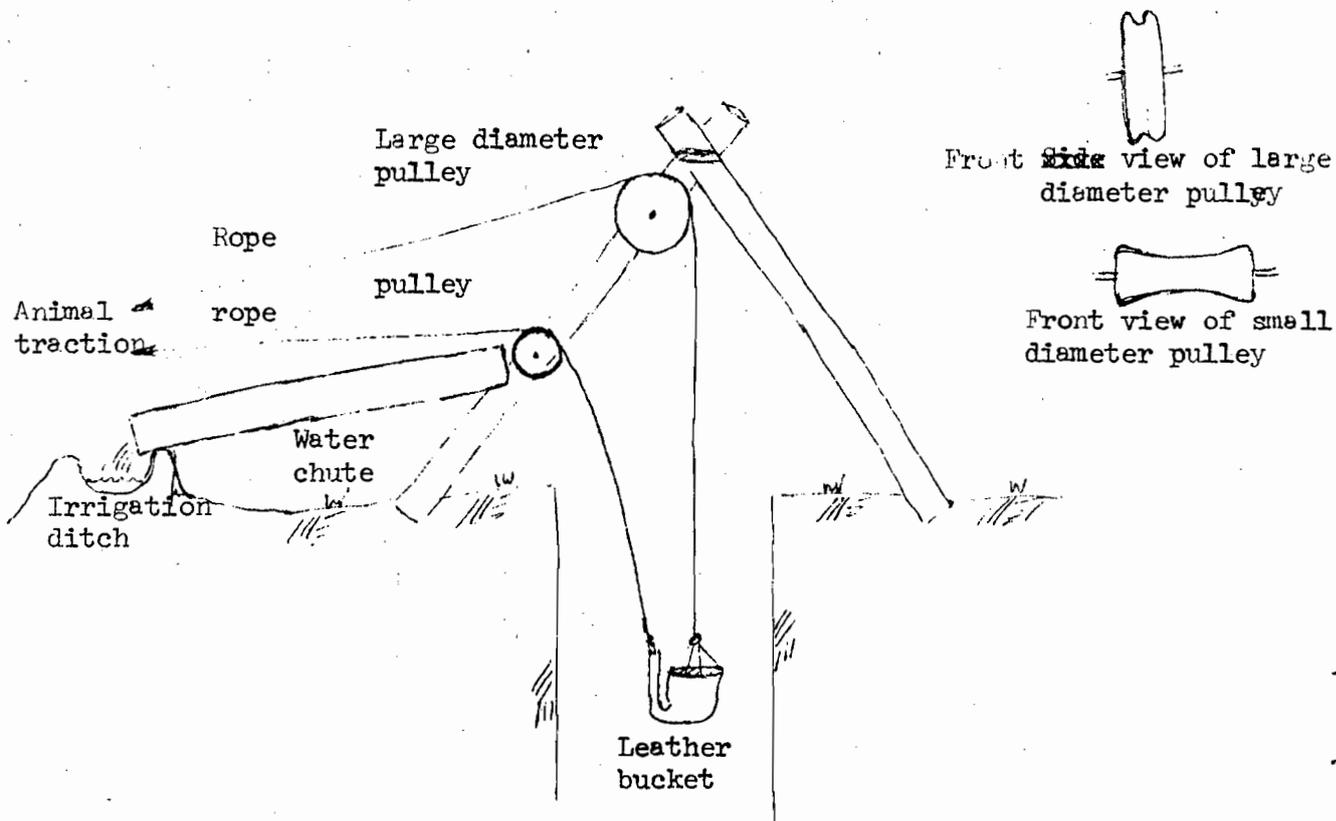


FIGURE @ 2 - Traditional irrigated garden well water lifting system located near Agadez in Niger

Table 5

WELLS AND DRILLINGS: ACTUAL AND PLANNED STATUS - 1983 - 1990

	<u>Status end</u>	<u>Status in 1980</u>		<u>Planned for 1981-83</u>		<u>Planned for 1983-1990</u>	
	<u>1979</u>	<u>Actual</u>	<u>In Process</u>	<u>1981</u>	<u>Financing</u> <u>obtained</u>	<u>Financing</u> <u>needed</u>	
Wells	5047	591	391		1061	930	
Drillings	241	133	5		2132	1620	
Total	5288	724	396		3193	2550	10,000
Cost (million CFA)		2930	1130		12,400	10,500	
Satisfaction-1980		6012 water points					1500 water points per
Total Planned-1983					5743 water points		year, i.e. approxi-
Cost (million CFA)					22,900		mately 8,000 million
Achieved-1983					1215 water points		CFA 1980/year
Estimated total cost, 1980-83					26,960		

Mud brick construction does not withstand the ravages of the rainy season, which, in the South can go as high as 800 mm during a 3-month period. Many Nigeriennes, thus, lose their houses during this period. At best, the interior of these homes becomes damp and extremely humid during the rainy season. Combined with a lack of sufficient clothing for wet weather, there is a general increase of vector-borne diseases during this season, and malaria, diarrheal diseases, and upper respiratory infections become major problems.

It was observed that most homes are constructed with private bathing areas for family members. Latrines were not constructed within any of the rural villages observed. Excreta disposal was accomplished by using the fields around the village for elimination.

What solid waste is produced by the rural village is first consumed by livestock and the remainder is buried or burned. Most villages with under 3,000 inhabitants were extremely clean and free of human refuse. Nevertheless, livestock excreta is found everywhere within villages. Rural villages of over 3,000 in population have visible solid waste disposal problems and require some organized activity by the population to resolve these problems.

At present, environmental sanitation of rural communities under 3,000 persons or with villages located near ponds or swamps do not appear to present an urgent public health problem. For communities over 3,000 persons, sanitation needs vary with regard to refuse disposal, animal and human excreta disposal, and rodent control. Those villages located near rivers, ponds, and swamps will have particular environmental sanitation problems with regard to water-transmitted disease and vector control. Contaminated water is a problem for villages of all sizes.

Water for family consumption is usually stored in a large clay jar within the compound. Water is retrieved from the jar by using a dipper which also serves for drinking. There is no evidence that storage jars are periodically cleaned. Some villagers strain the water through a clean cloth when pouring it into storage jars, others do not. There was no evidence of settling suspended solids with alum, of filtering the water through sand, or of boiling the water prior to consumption in any area visited. Water consumption appeared to average 20 liters per persons per day where wells or surface sources were within 1,000 meters of the village.

Personal hygiene of the rural population appears good as was the case for the cleanliness of their clothing. In this regard, problems occur in sensitizing rural populations to the need for washing of hands prior to eating as well as after eating, which is their current practice.

#### 5.42 GON Policy for Rural Sanitation

Although there is clear recognition by the GON of the contribution of rural sanitation to health, well-being, and quality of life of rural

populations, to date clear national policies for this subsector have yet to be established.

With regard to the needs of six urban centers in the country (Niamey, Maradi, Zinder, Tahoua, Agadez, and Dosso), requirements for improving storm drainage, sewage systems, refuse collection, and rodent and vector control are more clearly defined. The GON is seeking assistance to rectify potentially hazardous conditions.

The main thrust of the GON toward improvement of rural environmental sanitation appears to be through the RHIP and Village Health Teams (VHTs).

#### 5.43 GON Organization for Rural Sanitation

At present, the GON is organized for Rural Sanitation as follows:

- the Ministry of Public Works through the Directorate of Urbanism is responsible for programming, conceptual development, and execution of civil sanitary works.
- the municipalities are responsible for operation and maintenance of existing works and systems.
- the Ministry of Public Health and Social Affairs is in like manner responsible for developing and programming sanitation projects, particularly public toilets.

Existing government organization is in a state of evolution in an attempt to develop an organizational structure which can best respond to the needs of the country. The creation of the Directorate of Urbanism in the Ministry of Public Works and a Service for Study and Control at municipal level in Niamey are examples of recent organizational changes. In addition, a Central Service for Sanitation and a Directorate for Housing have recently been created in Niamey.

Within the MPH/SA (MOH), a National Service for Hygiene and Sanitation (NSHS) has now been operational for 2 years and has been placed within the Division of Hygiene and Mobile Medicine (DHMM). Current technical staff consists of a WHO Sanitary Engineer and 2 sanitary technicians.

#### 5.44 Current Status of Rural Sanitation

In the area of sanitation, the GON has concentrated primarily on problems of storm water drainage, solid waste disposal, and sewage disposal in the main urban areas. To date, little has been done outside the urban areas to improve basic sanitation.

Increasingly, the importance of preventive measures is becoming a priority for the VHT training. In the 1981 curriculum for Secouristes, of a total of 94 hours of instruction, 47 hours are being devoted to basic sanitation. Personal hygiene, food preparation, water handling and protection, village sanitation, penning of livestock and fowl, and use of latrines and garbage pits are covered. In the training program for Matrones, a total of 22 of 105 hours of instruction is being devoted to sanitation aspects. This training covers protection of water sources, measures to keep water clean, village sanitation, use of latrines, use of garbage pits, and importance of livestock and fowl.

Some training in hygiene and sanitation is being given to children through the public school system.

#### 5.45 Current GON Planning for Rural Sanitation

The GON is committed to the WHO goal of health for all by the year 2000 (HFA 2000). The means by which this is to be achieved is through primary health care.

By 1985, a goal has been set to obtain sufficient food production for the population.

By 1990, all children are to be inoculated against the principal infectious diseases. Sufficient water is to be made available for the entire population as well as completion of basic sanitary improvements.

By 2000, the GON plans to have complete coverage of maternal and child health care, including family planning, prevention and control of local epidemics, treatment of infections, diseases, and education concerning health problems, including preventive measures, where applicable.

During the First National Workshop on the UN Drinking Water Supply and Sanitation Decade, 2 alternative proposals were advanced concerning institutional arrangements for basic sanitation.

- 1) The National Service for Hygiene and Sanitation, along with all other sanitation activities, should be assigned to the Ministry of Public Works (MPW) where experience already exists in sanitation works. (The MPW has a large cadre of experienced personnel as well as necessary equipment).

or

- 2) All sanitation activities should be assigned to the Ministry of Hydraulics where water supply activities can be coordinated with those of excreta and storm water removal and treatment.

While this is being decided, the NSHS is reinforcing its cadre through the training for sanitary engineers, sanitary technicians, and sanitary agents.

## 5.46 Relationship of the RHIP to Rural Sanitation

The RHIP recognizes that ultimately primary activities in environmental sanitation must rest with the people. Accordingly, the main thrust of assistance of the RHIP to basic sanitation is through VHT training and services which support this activity. Coupled with efforts in the public schools, animation services, and media, health workers are to carry out sanitation education at the rural level.

In an effort to strengthen the supporting sanitation services within the MOH, the RHIP has as its goal the following outputs:

- 1500 Village Health Teams (6,000 persons) trained in basic sanitation as well as basic curative treatment and referral
- 2 (two) sanitary engineers to be trained in the United States
- 8 (eight) Sanitary Technicians to be trained in countries in Africa
- 75 Sanitary Agents to be trained at ENICAS in Zinder
- Sanitation improvements to be made to 220 existing health facilities
- Supply of educational and audiovisual material for VHTs, health centers, and dispensaries
- Technical assistance to the MOH through eight person-years of sanitary engineers
- Assisting the GON to analyze, identify, plan, execute, monitor, and evaluate environmental sanitation programs in Niger
- Assisting with training programs for sanitary agents

## 5.5 Disease Surveillance and Health Service Records and Reporting

### 5.51 Annual Report of the Activities of the MOH

The MOH publishes an annual report containing information on the operation of the Ministry and its activities. Similar reports are prepared by the Director of Health for each department (DDS). Expenditures, some population figures, data on human resource development, including the number of villages with health teams, numbers of MCH consultations, vaccinations, and cases of reportable diseases, as well as venereal and some other infectious diseases, are reported.

Reports contain little age-specific disease information nor do the annual reports contain usually-provided indices such as death rates (crude, infant, maternal, etc.). The absence of these important indices is not an oversight, but reflects lack of sufficient data from which to derive these statistical measures. The MOH is thoroughly aware of its data needs. It also recognizes the difficulties in getting meaningful data from a population largely illiterate and where taboos, other social factors, and great distances impede data collection.

## 5.52 Disease Surveillance and Reporting

The Division of Infrastructure and Statistics (DIS) of the MOH weekly receives telegrams from almost all arrondissement medical centers providing case data on reportable diseases. Where outbreaks of diseases are threatening, information may be exchanged by telegram daily.

The head of the statistical section of DIS noted that, over time, the quality and extent of field declarations are improving. While measles and meningitis reporting has been good, less serious diseases such as pertussis are often omitted.

## 5.53 Annual Report of the Directorate of Social Affairs and Protection of Mothers and Infants (DAS/PMI) of the MOH

DAS/PMI is an impressive unit within the MOH. It is well organized and data-oriented. Its annual report details numbers and locations of various services: prenatal visits, nutritional education and demonstration, immunization, and curative services provided. Additionally, there is a discussion of accomplishments and problems of various PMI facilities and services by location.

Basic data provided by DAS/PMI are measures of level of effort rather than performance or adequacy of performance. The assumption is that service efforts are effective and the aim is thus to push for progressive expansion and development.

From 1974 through 1979, prenatal visits and nutrition consultations increased by over 300% the number of dispensaries with PMI activities had grown from 44 to 140, maternity facilities had increased from 30 to 36, and, by 1981, the number of PMI and social centers had risen from 15 to 25.

DAS/PMI reports do not deal directly with the outcome of PMI activities on health status or improvement of functioning of village women as homemakers and mothers; these are viewed as givens.

## 5.6 Institutional Development and Logistic Support

### 5.61 Facility Construction and Renovation

Building sites for departmental headquarters at Agadez and Zinder have been selected.

With respect to construction of 7 dispensaries called for in the Project Paper, the evaluation team visited construction sites of 4 dispensaries financed by the RHIP. These were located at Awandawaki, Tajae, Tessa, and Ouna.

Dispensaries under construction were inspected by the team civil engineer for structural soundness and water supply and sewage systems involved.

In general, the quality of concrete used in the construction of these buildings was found to be marginal to poor. Although the dispensary inspected at Awandawaki may have been an exception, foundations, masonry, and reinforced concrete used in the construction of these buildings does not appear acceptable by any standards. It is apparent that the Ministry of Public Works has failed to exercise supervision over the contractor. By law, the Ministry is responsible for inspection.

The quality of work was so poor on the dispensary of Ouna that MOH officials on the Nigerienne evaluation team immediately discussed the problem with the Prefect at Dosso. Immediate action was promised by the Prefect to have the Ministry of Public Works rectify the situation. Unless action is taken to insure proper quality of workmanship and materials, serious structural repairs will be required for these buildings within the next 5 years. Parenthetically, it was noted during field visits that concrete work on OFEDES wells is of excellent quality. OFEDES batches and pours all concrete at construction sites.

During discussions with the General Engineering Officer of the Mission, it was learned that the French system of construction is used by the GON. In that system, detailed plans and specifications do not contain reinforcing steel details which are left to the contractor to prepare and submit to Public Works (MPW) for approval prior to beginning construction work. Unfortunately, details of reinforcing are not cleared with the AID Mission prior to MPW allowing the constructor to proceed.

With respect to design of dispensary sanitation systems, there does not appear to be a uniform system for handling liquid wastes. At one site (Awandawaki), holding tanks were provided for both dispensary and latrines. At Tajae, the latrine was provided with a holding tank. Treatment rooms which had sinks were connected to a seepage pit.

Considering the sandy nature of the soils in most areas, aquaprivies should have been considered for all latrines to eliminate odor, fly, and vector problems which will occur with present vault designs. This design requires an adequate water supply be available to the dispensary. (See Section 5.3 for a discussion of water supplies at RHIP-financed dispensaries).

Latrines provided at each dispensary are composed of 4 stalls enclosed by a 5-foot high wall. Privacy is assured by a short interior wall.

Plans for the latrines call for the floor to be sloped from the walls to a squat hole to permit adequate flushing and cleaning of the squat slab after use. The slope was not provided in any of the latrines inspected. If not added to these latrines, they will become unusable in short order.

All latrines are in need of a roof to permit their use during the rainy season and to provide protection from the intense Sahelian sun. In addition, latrines should be provided with small doors which can be locked when the facility is occupied.

Gravity sewer pipes change direction through a junction box approximately 12 cm. square where they exit the wall of the buildings to holding tanks or septic tanks. In almost every case inspected, however, the influent pipe was lower than the effluent pipe which will result in ponding of waste water in the junction box. A vector control problem and eventual stoppage with solids of the influent pipe is the certain result.

The main building at each dispensary has been completely wired to receive electrical current. In addition, at each site a powerhouse has been constructed to receive a 15 kilowatt gasoline - or oil-powered generator. The evaluation team recently learned that a decision was made by the government not to equip dispensaries with electric generators. The background or reason for this decision could not be discovered by the team.

The RHIP has programmed expenditures of \$1,600 per building for sanitary improvements to 220 existing health centers and dispensaries. Sanitary needs of dispensaries and health centers have not yet been inventoried. As far as could be discovered, no target list of structures for improvements has been developed. Nevertheless, funds allocated for this purpose have been used to construct and equip 120 water filters of which 96 have been located in the Department of Niamey in Tera arrondissement. These filters (discussed in Section 5.35 of this report) have been located at public schools, dispensaries, gendarmeries, at the home of the chief of a health center, at CMs, and in public areas.

In accordance with planned uses of RHIP funds, plans were made to construct 7 latrines with holding tanks at dispensaries and medical centers in the area of Tera. Further construction was abandoned due to poor workmanship and quality of materials used by the constructor following initial construction of 2 latrines. The evaluation team inspected one of the latrines designed with 2 bays. The main slab had cracked and was crumbling into pieces at each entrance. All walls were cracked, and the center wall, which divides the 2 bays, had lost its plaster facing. Supervision and inspection of work being done under contract had clearly not been carried out. Considering that a vault of considerable depth containing human excreta lies under the floor slab, this structure should be taken out of service as a danger to the public. The evaluation team was informed that the second latrine was in exactly the same condition.

It could not be learned in the time available whether USAID had reimbursed the government for construction or whether the GON has made any payments to the contractor.

The GON has recently solicited bids for construction of 44 latrines to be located in Niamey Department. The numbers planned are as followed: Niamey - 7, Say - 6, Filingue - 9, Ouallam - 5, Tillabery - 7, and Tera - 10. The highest bidder requested a total of \$517,000, or an average of \$11,750 each. The lowest bidder requested about \$236,000, for an average cost of \$5,360 per structure. It seems obvious that the cost of this simple sanitary improvement exceeds the funding limit for each medical unit. In point of fact, the highest bidder exceeds the total budget allocation.

### 5.62 Vehicle Maintenance and Repair

The provision of health care to rural populations is heavily dependent on appropriate and available means of transportation from national to departmental, arrondissement, and village levels. The number and types of vehicles required vary according to regions and to service demands. A reliable transportation system must have the ability to maintain vehicles, including servicing, repair, and availability of parts.

The MOH is developing a central facility in each Department which will group a garage, medical equipment repair center, training center, and office space for the DDS and his staff.

Of 6 Departments visited, only 3 could be said to have adequate facilities and staffing: Dosso, Niamey, and Tahoua. Sites have been selected for construction of the new AID-funded DDSs in Agadez and Zinder.

In Maradi it was not possible to carefully examine garage operations due to time constraints. The facility itself was of sufficient size to shelter 2 vehicles and was equipped with a pit, hoist, and vise. A small storeroom, which was locked, undoubtedly contained other portable equipment and tools. The Dutch mechanic had left for the day by the time the evaluation team had arrived in the early evening. It is understood, however, that a new garage is under construction. The current Maradi facility is totally inadequate.

The vehicle maintenance program is considered adequate in Dosso, Niamey, and Tahoua. Nigerienne mechanics are being trained in all 3 locations.

Mr. Rocchi, the UNICEF mechanic in the Niamey garage (servicing Niamey Department and the MOH), has a more than adequate training classroom. A 3-month training course for approximately 15 mechanics is planned to begin in June or July of 1981.

Tahoua reported its most promising apprentice has worked for almost one full year, but, as of April 3, 1981, he had not yet received any pay for his services. This should be rectified promptly. On the positive

side, however, Mr. Neuman, the Africare mechanic, is running a model garage. The shop is well equipped. Vehicles are routinely serviced every 5,000 km. This interval may be reduced to 4,000 km since some vehicles are experiencing major problems after 50,000 kilometers. One of the reasons for Mr. Neuman's success has been his ability to work through his DDS. He was even capable of getting CFA 80,000 released from the Prefect for purchase of spare parts in Niamey.

The situation in Zinder provides a stark contrast. Mr. Pierre, the Africare mechanic, though competent and conscientious, did not understand on his arrival 18 months ago the importance of working through his DDS. He became frustrated with delays in receiving much-needed equipment and drove to Niamey on his own. He was totally frustrated in his efforts to resolve his problems because his trip was not authorized by the DDS.

RHIP purchases of garage equipment for Zinder are reportedly in Abidjan and have been there for some time. If this is true, the team would urge the Project Support Management Unit of the Mission to do everything in its power to see that the equipment is transshipped from Abidjan at the earliest possible opportunity.

Furthermore, ordering and purchasing of electrical equipment should be carefully checked and controlled to insure that it is 220 volt, 50 cycle. Mr. Pierre received a U.S.-manufactured air compressor (funding source not clear) that was 220 volt, 60 cycle (50 cycle was ordered). That compressor lasted less than 2 months before the electric motor burned out. Voltage can be stepped up or down through the use of transformers, but cycles cannot.

Mr. Pierre is required to train other mechanics. Two experienced mechanics are available whose families live in Zinder. They would be happy to remain in Zinder at the government salary which is 1/2 to 2/3rds less than that of the private sector since they prefer not to leave their families. Every effort should be made through the DDS to hire such mechanics as soon as possible. They will move to another community if there is not a resolution of the hiring impasse shortly.

Mr. Pierre is responsible for 44 vehicles according to the records of Mr. Rocchi in Niamey. According to Mr. Pierre, however, he is responsible for 70. Irrespective, one man with 3 apprentices cannot hope to service, maintain, and repair either 44 or 70 vehicles in an ill-equipped garage without an operating budget.

In Zinder there is a problem of personality conflict between the DDS and Mr. Pierre. The GON should give consideration to transferring Mr. Pierre to the Agadez Department if his problems in Zinder cannot be resolved by the time the new facility is completed in Agadez. Before a transfer to Agadez, it is recommended that Mr. Pierre spend approximately one month in Tahoua with Mr. Neuman in an effort to learn how to get the Agadez garage off on the right foot. Should Mr. Pierre work out his relationship with the DDS in Zinder, it would still benefit the new mechanic hired by Africare for Agadez to spend some time with Mr. Neuman. Mr. Neuman, a former PCV, understands the system and how to maximize cooperation; he has wisdom useful for any new arrival.

Mr. Rocchi in the Niamey garage has overall responsibility for mechanics and vehicles in all Departmental Directorates (DDSs). In all, that includes 348 vehicles: 41-MOH (including ONPPC), 23-Agadez, 38-Diffa, 35-Maradi, 129-Niamey, 44-Tahoua, and 44-Zinder. In his position, he is supposed to travel to each Department at least once each year for inspection. Mr. Rocchi was the UNICEF mechanic in Conakry, Guinea, when one of the team was resident in 1967.

International Harvester Scouts purchased by the project have been the subject of much ridicule from the MOH. They were rumored to be dangerous and to burst into flame. Throughout our field trip, vehicle preferences were discussed with DDSs and their staffs as well as with the mechanics. Without exception all stated that the Land Rover is the vehicle most preferred and most useful for rural service. Specific criticisms of the Scout were that it overheats and is not made for this terrain; also, obtaining spare parts will be a problem.

It is true that the Scout overheats in Niger's climate. The vehicles have only a single core radiator, even though they have brackets for a double core radiator. If the bid request specified a "tropical package," a double core radiator should have been included and International Harvester should provide one for each Scout at no cost to the Project. If not, it would be advisable to order double core radiators and install them before major problems result. These radiators should be purchased with the existing budget for vehicles.

One of the vehicles that made up our inspection convoy was a Scout and it overheated often. Otherwise, it functioned well during the 4,500 km. trip. None of this is to say that Land Rovers would not be preferable if the problem of buying non-American products can be resolved. The Land Rover is clearly a superior vehicle for the purpose intended, parts are less of a problem, and it has been engineered for the type of terrain involved.

As for spare parts, the project budget allows one-third of the purchase price of each vehicle for purchase of spare parts. International Harvester recently sold its Scout operation to a firm in Texas; hopefully, this will not have a negative effect on availability of spare parts.

RHIP Mobylettes were considered by those who use them, as well as by the mechanics, to be an excellent choice in comparison with similar vehicles provided by other donors. High mortality parts should be identified as soon as possible and purchase orders processed to keep this useful transportation mode functional.

### 5.63 The Cold Chain

Vaccine-preventable diseases (especially measles) continue to plague most of Niger even though hundreds of thousands of doses of vaccine are administered annually. In an attempt to isolate possible causes of this phenomenon, logistical breakdown at the village level (apart from the cold chain) was examined. Effectiveness of the securiste in sensitizing

villagers to the importance of immunizations was also of interest. The team was interested to explore the extent of cause-and-effect knowledge about vaccines and disease prevention and to learn something about the frequency of adverse side effects with reference to method of vaccine administration.

Understanding by securistes of the importance and purposes of immunization and attitudes of securistes and villagers toward immunizations administered with Ped-0-Jets as well as by needle and syringe were explored.

The degree to which villagers accept immunizations or are dissuaded from seeking immunizations is often a function of complications following immunizations resulting from the antigens themselves or from aseptic techniques. Such matters were of interest to the evaluation team and were therefore among the questions included in non-structured interviews with securistes and matrones.

The methodology for vaccine cold chain evaluation consisted of examining all links in the chain. DDS garages were visited. Non-structured interviews with mechanics exploring adequacy of facility, equipment, operational budget, spare parts, personnel recruitment, training, maintenance, major problems with vehicles, and discussions were held with the team concerning possible recommendations for improvements.

Similarly, Equipes Mobiles were questioned and observations made concerning vaccine supply, transport, and storage. Refrigerator and freezer temperatures, condition, placement, vaccine grouping, adequacy of seals, presence of food or drink in refrigerators, frequency and duration of power failures, back-up procedures followed in the event of extended power shortages, and availability of generator or alternative sources of ice were also examined. Cold chests were observed and discussions engaged in regarding resupply of ice for extended field trips, some of which last up to 2 weeks.

The condition of the Ped-0-Jets was observed as well as physical examination of spare parts inventories and requests for parts. Personnel knowledge and training needs, sterilizing techniques, receptivity of villagers to immunization, immunization schedules, team programs, and alternative vaccine administration were all discussed with personnel of the Equipes Mobiles.

At DDSs, CMs, and dispensaries, where refrigerators existed, conditions were observed, temperatures measured (in the few that were functioning), and availability of spare parts and other repair services were discussed.

At ONPPC a non-structured interview was conducted with the Director, observations were made, temperatures recorded, random selection of inventory was made to identify rotation problems (if any), and adequacy of facilities were addressed. Procurement and inventory procedures, product grouping, and supervisory visits to Pharmacies Populaires (including cold chain repair), as well as the capacity of ONPPC to meet the needs of the RHIP were explored. When possible, visits were made to Pharmacies

Populaires where observations were made regarding general inventory and product grouping. Due to time constraints and evaluation team priorities, this activity was confined to fewer sites than had been planned. The team found few difficulties with any operation under ONPPC control.

Since none of the pharmaceuticals used by the securistes required refrigeration, and since ONPPC operations were found to have few problems, the cold chain was examined and attention then turned to the DHMM which provides vaccine and immunization services at the village level as described in Section 2.5.

The RHIP has purchased no vaccine for the project despite an existing budget for such purchases. All vaccines have been provided by third-party donors to date in sufficient supply to meet the demands of the country.

For procurement purposes the DHMM utilizes previous requests in conjunction with projected needs submitted annually by each DDS. Approximately 4-6 months is required from the date an order is placed before vaccine arrives from the manufacturer. Cables precede the arrival of the vaccine alerting MOH officials to the date and time of expected arrival. The system works if a conscientious individual is responsible for the program and has sufficient authority. Oftentimes, shipments do not arrive aboard the plane on which they were scheduled and someone must be designated to meet each future flight until the vaccine arrives and is received.

DHMM central storage in Niamey could not be evaluated because of outright refusal on the part of Dr. Alfa Cisse on several occasions to meet with the evaluation team, or to authorize members of his staff to meet with us or show their facilities. No reasonable explanations for evasions or refusal were given.

What has been reported about DHMM operations results from observations, non-structured interviews, and temperature measurements at DDS level. Dr. Alfa assured the logistics specialist over the telephone of his intent to meet with him in the company of the Project Director upon our return from the field trip. When told that we had seen that he was scheduled to be out of the country at that time (possibly in Abidjan), he assured us that this was not so and that someone had made up stories. When the team returned from the field trip, Dr. Alfa was in Paris. By the date of team departure on April 13, he had not yet returned to Niamey. Further inquiry revealed that neither Dr. George Jones, former AID Project Officer, nor Mr. John McEnaney, present AID Health Development Officer have ever been successful in attempts to meet with Dr. Alfa. The regional EPI Director of WHO, resident in Niamey for 2 years, has also been frustrated in attempts to meet the elusive Dr. Alfa. Since Niger will lose out on external assistance from other donors in this area if this continues, we urge the Minister to encourage Dr. Alfa to change his "no meeting" policy.

Vaccine is distributed quarterly by DHMM, taking seasonal variations into account, but apparently not taking current inventory into account. Because of this, if a Mobile Team falls significantly behind schedule,

they may not be able to accommodate a complete quarterly shipment and are forced to seek alternative storage for vaccine, which they do conscientiously.

On no occasion did the evaluating team find dissatisfaction by Mobile Team members with conditions of vaccine on arrival at a DDS. By chance, we were present just following arrival of vaccine in Zinder and the cold packs were still frozen. Cold packs are returned to DHMM headquarters in Niamey along with the styrofoam boxes in which they are shipped.

All DDSs are equipped with electric refrigerators, but none have back-up generator capability. Power shortages, though frequent, are normally not in excess of 15 minutes. In case of extended power failure, ice is taken from freezers and put into the refrigerators. This back-up system has not been used because of the reliability of electrical power in most departments. No refrigerators were equipped with thermometers and only one freezer in Dosso was so equipped.

All 9 refrigerators at DDS level were equipped with locks. No refrigerators or freezers were observed in Niamey Department because we were not permitted to see Ministry DHMM facilities which serve this department. The team has little doubt that they are acceptable. No food or drink was observed in any refrigerator. All were as well positioned as possible. Three had poor door seals but temperatures in all were acceptable. The mean was 4° Celsius, and the range was 3-8° Celsius. Maradi was the only Department without a functioning back-up refrigerator; they were equipped with one freezer and one refrigerator.

The freezer in Maradi measured out at -12° Celsius, in Zinder at -20° Celsius, and in Dosso at -23° Celsius.

At all the CMs and dispensaries visited, not one functioning kerosene refrigerator was observed. Only 2 functioning electric refrigerators were observed, but they were only 2 and 6 months old, respectively. One other electric refrigerator, 6 months old, had a burnt-out electrical unit. This unit was a 220 volt, 50 cycle machine made in Nigeria. Probably electrical current surge was responsible for its failure.

The farther one gets from department capital cities the less reliable the electricity. It would seem costly and futile to provide electric refrigerators beyond the DDS level at this time unless voltage regulators are specified and included as part of the package. Voltage regulators would protect the electrical units from power surges and add approximately \$100 to the cost of each unit.

Kerosene refrigerators also present problems. The present system for provision of spare parts for them is to provide the CM or dispensary with a line of credit in the form of petty cash with which glass chimneys, wicks, kerosene, and other supplies can be purchased. Problems result from either a lack of motivation or non-availability of such supplies at the canton level.

Dosso Department seems to have the most efficient system. The Dosso DDS purchases kerosene refrigerator spare parts and has an inventory at the DDS headquarters. This relieves the state and certified nurses from that responsibility.

If the cold chain is to be extended downward from the DDS level, it should probably be carried out in Dosso Department as a first step towards an Expanded Program for Immunization (EPI). Dr. Yansambou sees a diminished role for Mobile Teams as primary care facilities are increased. The weight of international opinion supports his thinking. As far as immunizations are concerned, Dr. Yansambou is particularly interested in making them available at dispensary level so that immunizations requiring a series can be adhered to in the dispensary village itself as well as in satellite villages through using Mobyettes or other all-terrain vehicles.

Because of excellent supervision in Dosso Department, an EPI project should first be started there. The team believes that if anyone can devise a practical, workable EPI program for Niger, Dr. Yansambou can. As is evident, the team was impressed with his skills, knowledge, and effectiveness.

Cold chests for transport of vaccines in all departments used by Mobile Teams date from the Smallpox Program. They were made from styrofoam boxes 3-4 inches thick; the interiors are lined with galvanized metal and exteriors with 3/4-inch plywood reinforced with angle iron. They are old and heavy but capable of conserving vaccine for approximately 5 days. In cases where teams are in the field for longer periods of time, one vehicle returns to the nearest ice source for resupply. We were fortunate to observe a team returning after 11 days in the field; a block of ice approximate 8-10 inches in diameter remained in the cold chest. Daily temperatures had exceeded 38° Celsius (101° Fahrenheit) for the previous 2 weeks.

In summary, the cold chain of the DHMM appears to be as good as can be expected. To extend the cold chain at this time to CMs and dispensaries might prove risky and costly, with the possible exception of Dosso and selected sites in Niamey Department. Such extension should proceed with caution.

Prior to expansion of cold chain, it would be strongly advisable to select 2 people who would supervise and teach cold chain methods. These functionaries should be required to attend a regional mid-level manager's course offered by the EPI program of the CDC in Atlanta, Georgia, in the U.S. This course is offered periodically in French. RHIP could support such an activity.

It was learned by the team that 2 years ago the MOH requested a specialist to assist in development of the cold chain in Niger. The evaluation team was told that the response from CDC was that no cold chain specialist could be sent until the MOH submitted an EPI plan. Since the MOH does not have anyone on its present staff with the knowledge of techniques and methods of preparing an EPI plan, a request should be made to RHIP for a specialist to assist in development of an EPI plan.

The AID Health Development Officer would be prepared to authorize utilization of RHIP funds to support such an activity.

## 5.64 Equipment, Supplies, Procurement, Distribution, and Inventory

### 5.641 VHT Level Supplies

Upon completion of training, securistes are issued health kits consisting of a wooden box with a padlock containing pharmaceuticals and bandages. Medications in the box include nivaquine, aspirin, carbon, Ganidan, ointment, mercurochrome, methylene blue, and Aureomycin ophthalmic ointment.

Initial stock is supplied at no cost to the securiste; subsequent resupplies of pills are sold to securistes at the government-subsidized price of 5 CFA per pill. The cost per pill to villagers must then be 5 CFA or securistes will be unable to purchase new supplies. Liquids and bandages are free of charge to all who need them.

Wooden boxes supplied are adequate in size and, in general, appeared to be in good condition. One kit, however, had the top broken from its hinges and the lock hasp was also loose. This box had been in service for 6 years. Supplies of liquids and bandages inspected were frequently low but rarely were supplies observed to be totally depleted. Pill supply in most instances appeared to be adequate.

Resupply of pharmaceuticals for securistes occurs in 2 different ways. The first, and most frequent, method is through supervisory visits which, in principle, are to occur monthly or bimonthly, but which in practice range from once a month to once a year. The second means of resupply is for the securiste to travel at his own volition and at his own expense to a DDS, CM, or dispensary; this rarely occurs. In fact, the only department in which this was observed was Agadez, and, in each case, securistes interviewed who availed themselves of this resupply method were Tuareg. They did not make trips solely for medication but purchased new supplies in larger population centers in conjunction with other business, i.e. marketing or purchasing.

In the past, issues of pills were limited to half-can (500 pills). In 1980, this was recognized to be insufficient, and quantities were increased from 500 pills to 1,000 pills. Where supervisory visits take place every 2 to 3 months, this appears adequate. No major resupply problems are anticipated from the CM or dispensary level to the securiste level. In fact, resupply and data collection appear to be the major, if not the only, reasons for supervisory visits. Review, observations, or guidance is rarely given. Dosso Department was a notable exception to this general observation.

In some instances, certain securistes may have as many as 2,000 indications for medication per month on a regular basis while another securiste may have as few as 50-100 per month. Supervisors are unable to explain and rarely explore the reasons for such disparities. The secur-

istes interviewed with the highest number of contacts per worker were Tuaregs working with nomadic people.

#### 5.642 Dispensary, CM, and DDS Level Supplies and Equipment

Dispensaries, CMs, and DDSs, without exception, were all adequately stocked with pharmaceutical supplies to meet the needs of the VHWs. Dispensaries with the largest stocks on hand tended to be the same dispensaries with the lowest frequencies of supervisory visits to VHTs. This suggests that certain pharmaceuticals are remaining on CM and dispensary shelves rather than being distributed and used for their intended purpose.

In general, product grouping was acceptable, sometimes excellent and occasionally a bit sloppy. Overall, the team found outdated does not appear to be a significant problem. Random examination revealed outdated pharmaceuticals at only one CM despite an absence of inventory lists. The outdated products were not high-usage items and probably should not have been stocked at all. This instance cited did not involve a significant quantity of drugs.

On no occasion did a DDS, CM, or dispensary complain about excessive time delays involved in receipt of medical equipment. (None of the 4 AID-funded dispensaries visited was ready to be equipped.) This was not thought to be however, meaningful since, in rural areas of developing countries, equipment is usually slow in arrival. When it finally does arrive, it is most appreciated. This particular process must be looked at from the Ministry headquarters as well as from the field to assess functioning. The inability to have ready access to information in the time available made it impossible, within the period allowed for this evaluation, to assess this component of the system. However, numerous instances were observed that indicate that garage equipment, Ped-O-Jets and spare parts, and cold chain equipment have all experienced significant time delays in distribution over the past several years.

#### 5.643 Pharmacies Populaires and the ONPPC

Time constraints did not permit extensive visits to Pharmacies Populaires, but three were visited for a look at product availability and product grouping. From the moment one enters the door, it is apparent that Pharmacies Populaires are a micro-image of the ONPCC. It was clearly evident that there need be no concern with these organizational units. Products are well stored and distributed; supervisory visits from ONPPC occur on a bimonthly basis.

Field visits confirmed our experience at ONPPC headquarters. The team found the ONPPC to be a well organized, financed, and dynamic organization. A Burroughs B 90 computer inventory was installed on approximately March 1, 1981, and ONPPC is in transition from using a less powerful Burroughs L 4000 (to be utilized for personnel and other office

functions when the B90 has been phased into operation). Burroughs equipment was chosen because there is service in Niamey and so is readily available.

ONPPC warehouse space is more than adequate; it is neat, clean and air-conditioned. Product grouping is excellent and expiration dates are controlled. There is a walk-in cold room for items requiring refrigeration with temperature monitoring capability, and the system is complete with a back-up generator capable of powering the entire complex. A random sample from 30-50 shelves revealed two vials (Vitamin B-complex) that had expired February 1981. Since expiration dates are controlled and vigilance is maintained, it was estimated that there was less than one percent waste factor, and this is an organization with CFA 16 million or more in pharmaceuticals passing through ONPPC each year. Most impressive.

#### 5.644 Ped-O-Jets and Mobile Medicine (DHMM)

With the exception of Niamey Department which has 14 brand new Ped-O-Jets (POJs), in service for 2 months, all POJs in the other 5 Departments visited were placed in service during the Smallpox/Measles Program of 1966-1970; the last shipment of smallpox POJs arrived in 1969. Generally speaking, POJs seen in the field were capable of delivering about one-half of a given dose at about one-half the necessary force to achieve penetration. This means that most of the vaccine leaving the POJ simply runs down the recipient's arm. This intolerable state of affairs results from a variety of malfunctions including leaking feed needles, creeping (or rushing) pistons, leaking vaccine chambers, teflon ball valves that will not seal, vaccine and hydraulic quad seals, and O-rings that leak. In short, almost everything that could possibly be wrong with these important medical instruments is wrong with almost all of them.

After observing the condition of these POJs, it can be said that, with the exception of Niamey Department with its 14 new POJs, perhaps only 10% of all vaccines recorded as administered with the POJs by the DHMM are, in fact adequate doses of vaccine capable of stimulating antibody response and achieving immunity. Until this situation can be rectified with new Ped-O-Jets, spare parts and personnel training in the operation, maintenance and repair of this apparatus, DHMM should be advised by the Secretary General of the Minister to cease and desist from using this means of delivering vaccines.

In 1979, the RHIP purchased \$41,500 of Ped-O-Jet spare parts which were delivered to DHMM for distribution to all departments. The evaluation team believes that an estimated \$500 worth of parts were distributed to each of the 6 Departments while the remaining \$38,500 in parts remained in Niamey. Meanwhile, a communication was sent from the Ministry to DDSs stating that the U.S. State and Defense Departments had a monopoly on the POJs and spare parts and that it was impossible to obtain more. (A copy should be included as an appendix to this report. So far, the Health Development Officer has been unable to locate it.)

TABLE 6

PED-0-JETS USED BY EQUIPES MOBILES FOR ADMINISTERING  
IMMUNIZING AGENTS (BY DEPARTMENT)

<u>Department</u>	<u>#POJs</u>	<u>#POJs capable of delivering an immunizing dose</u>	<u>Adequate Spare Parts Inventory</u>	<u>Personnel Trained in Trained in Operation, Maintenance &amp; Repair</u>
Maradi	4	0	No	1
Agadez	4	1 (possibly)	No	0
Zinder	6	0	No	1
Tahoua	4	0	No	0
Dosso	4	1 (possibly)	No	0
Niamey	14	14	Yes	1
Total	36	14 (2 possibly)	5-No; 1-Yes	3

A significant stock of spare parts is currently in the care of Mr. Yoley Diergou of DHMM. They remain in the cartons in which they were shipped, and these cartons have deteriorated, allowing individual pieces to spill out. They have not been inventoried nor placed in any type of organizing drawer or compartment. The previous AID Health Officer, having had no direct experience with Ped-0-Jets, could not make a meaningful evaluation of the need for parts requested by the Ministry. As a result, perhaps \$6,000-8,000 in parts were not needed while insufficient and less costly high-mortality spare parts such as teflon O-rings, rubber O-rings, small ball valves, and split teflon piston seals should have been increased substantially. It was found also that not a single vial holder was requested in the order and yet not one POJ seen in the field had a vial holder in good condition. The RHIP would better have spent \$30,000-\$35,000 on new POJs and \$10,000-15,000 on spare parts. The logistics and cold chain specialist has volunteered to organize a list of what would constitute an adequate inventory, if requested by the Ministry or the Mission. This list could then be considered as an inventory of existing spare parts to arrive at a conclusion of parts still needed. There was insufficient time to do this during the evaluation period.

The evaluation team was also informed that an additional 12 new Ped-0-Jets purchased by UNICEF are in a DHMM warehouse awaiting Dr. Alfa's distribution orders. It was unclear how long these have been in the country, but this could be determined by UNICEF. In the specialist's view, these may be better off remaining in stock until a training course is conducted.

WHO generally favors phasing out Mobile Teams using Ped-0-Jets as a means of administering immunizations. However, after reviewing the cold chain (discussed in depth in another section), it does not appear that a complete move away from Ped-0-Jets and Mobile Teams would be meaningful in Niger at this time. Distances are simply too vast and the infrastruc-

ture is not yet well enough developed. In the meantime, the cold chain for static facilities can be slowly and carefully developed and the use of Ped-0-Jets is advised.

Since continued use of the Ped-0-Jet was advocated, the evaluation team attempted to determine their acceptance by villagers and mobile health teams as well as possible complications resulting from its use. Villagers appear to have less fear of the Ped-0-Jet than they do of needles and syringes. They are not completely without apprehension, but prefer the Jet because of its speed. Mobile Team members shudder at the thought of having to use needles and syringes; they would be forced to reduce their schedules by at least one-half if needles and syringes were to be used.

Complication rates from Ped-0-Jets do not appear to be out of the ordinary. Some swollen arms and fevers, but few sterile abscesses, seem to result from the use of Ped-0-Jets. No complaints were heard of lacerations. The specialist doubts, however, that most guns seen were capable of injecting with enough force to cause a laceration.

#### 5.7 Manpower Development

By far one of the most important components of the RHIP is its emphasis of human resource or manpower development. To reach dispersed and remote rural villages, trained manpower, insufficient numbers, along with logistical support for their efforts, a referral system, regionalized services, and necessary system supports are all essential to a functioning system. A system, made as it is of many components, must work together and the components must interrelate.

The RHIP provides support for manpower development and the attainment of rural health manpower development goals set by the government in the Three- and Five-Year Plans described elsewhere in this report. A series of other manpower support elements are also being provided. Since the project funding has been integrated into an existing government program, it can be seen as either substitutive or additive, depending on the point of view of the observer. In the case of the village health workers, support is to be provided over the LOP for the training of 6,000 secouristes and matrones and the retraining of 13,500 VHWs. Note that the project did not commit itself to support for 6,000 additional village health workers, but rather for support of 6,000, without additionality as a criterion. If the government over the LOP were to produce only 6,000 in total, they would have met their obligation. It was concluded by the team that the support given under the RHIP is additive in that this financial support frees up funds to engage in activities that AID, by virtue of its policy terms of reference, is not in a position to support. The team finds no fault with this state of affairs, although, in general, it would have preferred to see the GON commit itself to support of a specified number of VHWs from its own funds.

Training for a number of categories of health workers is being supported, and each category will be reviewed separately and sequentially in subsections below.

## 5.71 Village Health Teams

Village Health Teams (Equipes de Sante Villageoise) are comprised of one or more securistes who render a selected range of curative and preventive services, and one or more matrones, or villages midwives, who, for the most part, were traditional midwives who have been given a 10-day training period.

In public health there is an argument known as the quality-quantity issue which, since Alma Ata, has been resolved in most countries on the side of quantity. Community health workers are trained in a limited number of useful health interventions which are intended to be preventive, protective, promotive, or curative, and apply proven technologies, methods, medications, and procedures, each with low unit cost to large numbers of persons. The expectation is that such interventions will, in time, reduce morbidity, diminish chronicity, and lower mortality rates.

One example is the use of Aureomycin ophthalmic ointment in cases of simple, early conjunctivitis. Although at one level this is a curative intervention, it is also preventive. The intervention cures conjunctivitis, but prevents blindness. By having large numbers of workers (quantity) who provide this intervention as necessary, in time, the incidence, and over a longer time span, the prevalence, of blindness will decrease. The problem of quality enters when faced with the fact that workers with limited education and literacy can only be trained to perform a limited number of interventions, such as the example given. Fair enough. What was once said in India by a medical educator must be borne in mind however. At that time in the 1950's, he maintained that India would have first-class medicine or nothing. Under his thinking, most of India's 560,000,000 people received just that - nothing. Fortunately, India and its health ministry have changed that policy.

The GON has quite correctly opted first for quantity equitably distributed in terms of manpower, and, when and as the system is in place, will upgrade quality of manpower available in the health sector. The team endorses this approach of the GON in increasing VHT numbers and thereby increasing coverage. Clearly, at a later stage, the numbers of certified nurses will be increased as finances and literacy levels permit.

### 5.711 VHT Training Outputs

As was pointed out above, the larger the quantities of rural securistes and matrones selected and trained, the greater the health coverage of the rural population. Coverage involves accessibility, availability, and, in predominantly public sector programs, must also include affordability.

In 1978, at the time of institution of this project, a goal of the project paper was to assist in bringing basic health services to 3,500 villages, or about 39% of the rural population, through financially supporting training of 3,000 securistes and 3,000 matrones.

Let us examine training outputs for the years 1978 to 1980 of these two categories of workers. Table 7 lists securistes and matrones trained during this period.

From Table 7 we see that the numbers of securistes and matrones trained doubled in 1980. This level of training is projected to remain in 1981 as well.

TABLE 7

TRAINING OF SECOURISTES AND MATRONES BY THE GON  
ALL DEPARTMENTS

1979-1980

	<u>Prior Year</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>Total</u>
Secouristes	1,529	438	461	907	3,335
Matrones	1,262	533	483	947	3,225
Totals	2,791	971	944	1,854	6,560

Source: Aggregated data abstracted from MOH Statistics, 1977-80

To answer the question of substitution versus addition, securistes trained and charged to the RHIP were analyzed and this analysis is shown in Table 8.

TABLE 8

SECOURISTES AND MATRONES TRAINED - BY SOURCE OF FUNDING  
ALL DEPARTMENTS

1979-1980

	<u>1979</u>			<u>1980</u>		
	<u>GON</u>	<u>USAID</u>	<u>Total</u>	<u>GON</u>	<u>USAID</u>	<u>Total</u>
Secouristes	56	405	461	77	830	907
Matrones	272	211	483	232	715	947
Total	328	616	944	309	1,545	1,845

It is apparent from Table 8 that the numbers trained and funded by USAID tripled in 1980.

Table 9 below indicates the proportion of VHWs trained over the biennium 1979-1980 by source of funding.

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TABLE 9

VHws TRAINED - BY SOURCE OF FUNDING  
ALL DEPARTMENTS

1979-1980

	<u>GON-funded</u>	<u>USAID-funded</u>	<u>Total</u>	<u>% USAID-funded</u>
Secouristes	133	1,235	1,368	90.2%
Matrones	504	926	1,430	64.7%
Totals	637	2,161	2,798	77.2%

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As may be seen from Table 9, about 90% of securistes and 65% of matrones trained in 1979-80 were paid for with USAID support.

The numbers and percent remaining to be trained with USAID support over the LOP are given in Table 10 below.

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TABLE 10

SECOURISTES AND MATRONES TO BE TRAINED WITH USAID FUNDING  
DURING BALANCE OF PROJECT

	<u>Secouristes</u>	<u>%</u>	<u>Matrones</u>	<u>%</u>
RHIP total (1979-82)	3,000	100%	3,000	100%
RHIP-supported (1979-80)	1,235	41%	926	31%
To be trained (1981-82)	1,765	59%	2,079	769%

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Examination of Table 10 reveals 41% or 1,235 securistes and 31% of matrones eligible for support under project funding have now been charged to the RHIP. Given numbers trained in 1980, if similar numbers are trained and charged to USAID in 1981 and part of 1982, the project funding for this training component should be fully absorbed within the existing life of project.

Turning to the matter of villages covered, Table 11 indicates the progress in extending coverage under the project since its inception.

TABLE 11  
VHT VILLAGE COVERAGE  
1977-1980

	<u>New Coverage</u>	<u>Cumulative Villages Covered</u>
1977 and prior	-	1,263 (through 1977)
1978	233	1,496 (through 1978)
1979	187	1,683 (through 1979)
1980	600	2,283 (through 1980)
Total increase in villages covered 1978-1980	1,020	

As may be seen from Table 11, 1,020 additional villages had VHT services added to them in the years 1978 through 1980 for a total of 2,283 of the 8,615 villages in Niger, indicated in the GON 1979 Statistical Annual (p. 49). This suggests that, at this point in time, 26.5% of all villages are now covered. It appears that if current and projected rates of training of VHTs are maintained then the 39% target population coverage of 3,500 villages will likely be attained. There are 1,077 villages targeted for service yet to receive VHTs. This means, at minimum, 2,154 VHVs must be produced. If 1,800 are produced in 1981 as was the case in 1980, and 1,800 are produced in 1982, there will be a surplus of 1,446, which will take care of attrition and permit a number of villages to have more than one securiste and one matrone as is presently the case in a number of villages.

From the standpoint of villages covered, it is a slightly different picture; 2,283 were covered by the end of 1980. An additional 600 in 1981 will result in coverage of 2,883. If an additional 617 villages can be covered in 1982, quite clearly the target of 3,500 villages can be attained.

Percentage of rural population covered requires demographic information which would take some weeks to assemble and analyze, but a cursory analysis suggests that with the above rate of production maintained through 1981 and 1982 the target percent rural population figure can also be attained as well.

At Departmental level, the proportions of VHWS in relation to proportions of national population in the Department shows roughly equitable proportional distribution by Department. Within Departments, however, as might be expected, coverage is moving from more easily serviced to the more remote and less easily serviced villages. The MOH is aware of this problem and has planned to further emphasize equitable distribution of VHTs within Departments over the plan period 1979-1983. Compared with many West African neighbors, the GON has done very well in this regard, and the team urges the MOH to maintain vigilance in this matter. Given the difficulties of climate and terrain, much has been accomplished in Niger. The team congratulates all involved in this aspect of the work.

#### 5.712 Training of VHTs

The review of health training in Niger was hampered by the fact that the evaluation period coincided with the onset of annual vacation for all schools. Schools were closed, faculty on leave, students at home, and only a few persons available. Within these constraints, an evaluation was mounted.

Review of the syllabus-outline for securistes and matrones showed that high priority, appropriate health problems were being addressed. For securistes, conditions such as malaria, diarrhea, otitis, conjunctivitis, and their treatment are covered during training. Simple wound care, identification of possible tuberculosis, fracture splinting, record keeping, hygiene, and nutrition as well as referral, immunization participation, and causes and prevention of guinea worm and bilharzia were given curriculum time during the 11-day training period.

On the 2nd through the 9th of July, 1980, in Zinder, the First National Seminar on the Training of VHTs was held. A reformulation of the VHT training program was undertaken and a 94-hour training plan developed for securistes as follows.

- a) nutrition (22 hours)
- b) water sources and their protection (15 hours)
- c) environmental sanitation (14 hours)
- d) maternal and child health (time not indicated)
- e) illnesses and injuries and their treatment strategy (25 hours)
- f) health education (18 hours)

For matrones, a 105-hour training program was developed which now consists of the following components:

- a) promotion of correct nutrition (26 hours)

- b) provision of convenient and safe water (17 hours)
- c) environmental sanitation (14 hours)
- d) maternal and child health and child spacing (26 hours)
- e) principal health problems of mother and child (18 hours)
- f) birth and death registration (4 hours)

It was of interest to note that child spacing receives only one hour of classroom time in the new program.

Although few teaching aids were in evidence during field visits, the 1981 training plan visualizes the use of flannelgraphs, figurines, tape recorders, slides, and films in teaching. These techniques were seen as valuable and it was a totally Nigerienne group that resolved to include these methods of instruction in the new program.

The use of broadcast radio has also begun for health education and in areas covered by television, planning for its use in the health program has begun.

In view of consciousness-raising which resulted from the National Seminar and agreement to adopt and institute this program, it would be premature to attempt to evaluate this new effort beyond observing that its conceptual directions are correct. The plan is properly conceived and the means of implementing it do not, on the surface, seem unrealistic. Mechanisms for training, training sites, and experience in training are actualities rather than plans alone in Niger. It seems reasonable to assume, given Niger's record to date, that much of what is planned will be implemented. For these reasons, a detailed critique would be premature.

It is suggested and recommended that a mini-evaluation directed at training of VHWs be instituted in October or November 1981 to observe and study actual implementation of this program and to determine needs and means whereby quality of instruction can be assisted. At this point in time, it is evident that a number of deficiencies in training have been recognized by the Nigeriennes, problems have been considered, solutions envisioned, a plan of action developed, and a program for implementing the plan of action produced and distributed nationally. Time must now be given to learn what problems will be encountered during implementation of this new iterative step in improvement of training of VHWs.

Notwithstanding the above remarks, the team would like to see the VHT training program extended a few more days with several hours of child spacing added to the matrones' program.

#### 5.72 Certified Nurses

The most peripheral site where health care is delivered is the village which is serviced by securistes and matrones. The next level is that of the dispensary, the first level static, fixed facility to employ full-time health workers paid by the Ministry of Health.

Rural dispensaries serve a cluster of villages with a combined average population exceeding 10,000. This most peripheral health facility is described as being at the "canton" or subdistrict level. The principal staff member of a dispensary is the certified nurse (infirmier certifie) who provides all curative and preventive services to the surrounding canton. It is also from the rural dispensary (or from the CM, where none exist) from which supervision of the VHTs begins. The certified nurse is thus a principal link in the rural health network, and the GON plans to expand and increase the numbers of these workers during the present Five-Year Plan period (1979-1983) while simultaneously broadening the base of services through continued increase in numbers and quality of VHTs.

Certified nurses are the professional vertebrae of the health system skeleton in Niger. Admission to ENICAS (National School for Certified Nurses and Social Aides) is competitive and entrants have 2 or more years of secondary school, and, until 1981, were given a one-year course in instruction in Zinder. Upon graduation, they next serve in a health center (CM) for one year and then are posted to a solo assignment in canton-level dispensary.

Beginning in 1981, at the request of certified nurses themselves, their training is being increased to 2 years in length. The second year of the curriculum will be devoted to supervised practical clinical experience to reinforce the classroom lessons and studies undertaken in the first year. With additional time in the curriculum available, expansion and addition of new material will be possible. The 2-year curriculum can be found in the Appendices to this report.

The ENICAS is located in a new and well-planned school opened in October, 1976. The school was seen during vacation and students were not in place. The classrooms, auditorium, library, and laboratories are large, airy, reasonably clean and maintained. The impression was, however, that there were few teaching materials, books or texts in evidence. The library was particularly sparse in this regard.

All faculty members of ENICAS must be state nurses (diplome d'etat) with a minimum of 3 years of field experience. They must pass a national exam and are required to work for one year as a teaching assistant. An additional year of training in Yaounde or Dakar brings them to approximately a Master's level of training, following which they return to ENICAS. In 1980, there were 11 instructors for nursing and midwifery students and 2 instructors for social aides. The ENICAS faculty was augmented by 8 part-time instructors.

#### 5.721 RHIP Certified Nurse Training Inputs

The Project Paper commits the RHIP to support of 40 certified nurses per year for a total of 200 over the life of project. Training costs in 1978 were approximately 400-460,000 CFA per certified nurse (about \$1,600-1,800 per graduate). It is not known what will happen to costs per graduate when the program is increased to 2 years. It would not be

unreasonable to assume that, with inflation and added instruction time, costs would at least double. The RHIP should be prepared to absorb increased costs associated with improved training for this vital link in rural health care and VHT supervision. In any project revision, RHIP should commit itself to additional resulting costs even if it should prove necessary to reduce other project component funding to do so.

#### 5.722 ENICAS Certified Nurse Outputs

When ENICAS first began, it produced approximately 70-80 graduates yearly. In 1978 this number was increased to 120 per year. There are few failures or drop-outs from the program.

TABLE 12

CERTIFIED NURSE GRADUATES OF ENICAS

	<u>Entries</u>	<u>Graduates</u>
1975-76	84	76
1976-77	83	78
1977-78	122	116
1978-79	124	118
1979-80	134	127
Total graduates 1975-80		515

As indicated above, the RHIP has agreed to support roughly one-third of the output of certified nurses from ENICAS over a 3-year project life. If the project is extended for an additional 2 years as recommended, the Mission must decide whether it is willing to support the added costs of a 2-year training period for certified nurses, whether it will continue to support 40 2-year graduates for a total of 120 student-years of training, and whether it will support training of an additional 80 2-year graduates during the period 1983-84. The position of the team is that VHT training and certified nurse training are in line with AID's Health Sector Policy and a good investment. We recommend and support such a course of action on the part of the Mission.

#### 5.73 State Nurses (Infirmiers D'Etat)

The third level of Niger's health system is the circonscription medicale or CM located at arrondissement level. State diploma nurses head each CM. Often, CMs are also staffed with a state-certified midwife

(Sage Femme), one or more certified nurses, and several auxiliary personnel. Not all CMs have a full complement of personnel.

CMs are modestly equipped and relatively few have laboratory capacity. Even fewer have X-ray equipment. The CM, however, is a vital link in the referral chain, providing health services to the surrounding population and supervising all rural dispensaries and all VHTs (on a quarterly basis) within the arrondissement. CMs usually have a dispensary, a PMI center, a maternity ward, and a hospital ward, usually in one location.

Thus, the CM is the link which ties the rural health system to hospitals at Department level. Physicians are first found in Niger's health system at the hospital level.

#### 5.731 RHIP Inputs to the National School of Public Health (ENSP)

The RHIP has committed itself to support 20 state nurses for each year of the project for a total of 100 by original EOP. Since the state program is three years in length, this represents support for average costs of 20 first-year, 20 second-year, and 20 third-year students each year. Over the life of the project, 300 student-years of state nurse student support were envisioned in the PP.

The level and quality of training at ENSP presents few evaluation problems. The school is clean, physically well developed, well organized, well managed, well staffed, and has a well developed curriculum. By the final year of the present project, approximately one-quarter to one-third of those students trained during the 3-year life of project will have been RHIP-supported. This category of worker is vital to the supervision of the rural health system, and little more beyond that important and justifying statement need be made.

The team unanimously recommends support of an additional 40 graduates per year in the years 1983 and 1984 if the project is extended. Obligation of additional funds to permit 20 graduates (60 student-years) for a total 40 x 3, or 120 additional student-years of support is recommended. Such funding, as in the case of certified nurses, is money well spent and assists materially in expansion of the health system, permits continuation of expanded rural outreach, and second-level VHT supervision which includes quality control through supervision and reliability checks on dispensary level supervision of VHTs.

#### 5.732 State Nurse Outputs from ENSP

The National School of Public Health, established in 1965, is located in Niamey. It trains state nurses, state-certified midwives, and laboratory technicians. A breakdown of the 1980-81 enrollment of 285 students is shown in Table 13 which follows.

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TABLE 13

NATIONAL SCHOOL OF PUBLIC HEALTH  
ACADEMIC YEAR 1980-81 ENROLLMENT

<u>Class Year</u>	<u>Regular Students</u>		<u>Competitively Selected Certified Nurses</u>		<u>Total</u>
	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>	
First Year (Joint Curriculum)	33	44	18	1	96
Second Year					
Nurses	24	19	11	0	54
Midwives	0	31	0	2	33
Third Year					
Nurses	23	10	10	0	43
Midwives	0	22	0	0	22
Laboratory Technicians					
1st Year	11	10	0	0	21
2nd year	1	11	0	0	12
Totals	92	147	39	3	281
Total: Female - 149 Male - 132					

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It will be noted that 43 state nurses are in the final year; only a few will fail to graduate.

The school was built with a capacity to graduate 60-65 students per year, but, quite wisely, the MOH is concentrating heavily on the most peripheral workers at present and gradually will increase the output of state nurses as certified nurses and VHTs are increased.

Training costs are in the range of 480-500,000 CFA per student per year (about \$2,000), and as is true for ENICAS, tuition is free to the student. Students receive stipends to cover food and lodging and the Ministry employs all graduates. Those who graduate are assured of employment since output is projected into what the British call the establishment's budgeting.

An interesting and excellent aspect of the school's admission policy is that students are admitted from 2 streams. The first stream consists of those who have completed the first cycle of secondary education prior to admission. The second group consists of those who have been certified nurses with at least 4 years of work experience as certified nurses. This latter group, currently 41 of 194 students, is selected on the basis of a national examination.

The Director and faculty believe those students who have served as certified nurses to be usually the best of their students and they have gradually increased the proportion of such students from 16% of the total (30 of 1987) in 1976-77 to 21% of the total IDE (infirmiers D'Etat) enrollment (41 of 193) in the 1980-81 group.

The decision to enlarge the proportion of those coming from certified nursing backgrounds is wise on two counts. First, it brings field experience and seriousness of purpose to the classroom, and secondly, it provides a career ladder, promotion potential, and upward mobility to superior certified nurse performers. Career ladders are often missing in developing country health systems.

The ENSP has begun continuing education training for state nurses, and, although discussion would be beyond the time available, results of this first retraining cycle activity were most satisfying and deserving of continued support.

Team members were very impressed with the competence and human qualities of the Director of ENSP. He is to be commended for his perspective, insight, and commitment to an important link in Niger's health chain. We found him a delightful person.

The initiation of training of laboratory technicians can only be mentioned in passing. The Mission and Health Development Officer would be well advised to further explore possibilities for supporting this iterative step in the improvement of Niger's health care system. Hospitals will quickly absorb their complement of technicians and extension of laboratory technicians to the CM level would and will do much to improve the level and accuracy of diagnosis and correct treatment in ambulatory and infirmary care given at CM level. Laboratory technicians would also provide back-up for dispensary level referrals who can afford to travel to CMs but not to Departmental level hospitals.

#### 5.74 National School of Medical Science

The PP provides for funds for 175 third-year medical students at the National School of Medical Science to receive field experience in rural health care. To date, this funding has not been utilized. Given the professional terms of reference for graduates of the medical school, there seems little purpose at this point in time to begin such an activity. Accordingly, it is recommended that these funds be reprogrammed into VHT, certified nurse, state nurse, or laboratory technician training for rural health care. There will be a greater return on investment over a long term.

Provision was also made in the PP for funds to be made available for medical faculty to carry out operational field research. We recommend this funding be retained, but that the terms of reference be broadened in redesign to make possible funding of social and behavioral scientists to undertake research of genuine value to the rural health system, or for collaborative operational studies in Niger to be undertaken jointly

with one or more university faculty members or advanced professional students who are already health professionals but who are pursuing the Doctor of Public Health Degree. An example of such an arrangement was that of a physician, Dr. John Wellman, who, as part of his Dr.P.H. requirements at Johns Hopkins School of Hygiene and Public Health, for 2 years did operational studies of the Gbaja Street Clinic in Nigeria and its results were used in formulating a community nurse program and its implementation. Dr. Cecile DeSweemer, now a faculty member at Hopkins and a Belgian, has done several such studies. Examples abound.

Dr. Kadry Tankary did a thesis at Dakar for his doctorate in medicine on a topic which would qualify for funding support under the PP if it were done today. The Project Director and Health Development Officer are urged to utilize this money for seminal and relevant studies which will feed back into Niger's health system. It is unlikely that busy MOH personnel themselves will have either the time or inclination to undertake such studies.

Given the workload of medical faculty in Niamey, it may only be possible for them to collaborate with an advanced student from abroad on such studies. Such studies are always labor-intensive, but when topics are chosen carefully and are relevant, they are rewarding and hold up a mirror to the system to help it see itself. This money should not be reprogrammed; it was provided with forethought and should be used for its broadened but intended purposes.

## 5.75 Manpower Development in Sanitation

### 5.751 Village Health Teams

Approximately 34% of the curriculum of matrones is devoted to rural environmental sanitation, while 50% of the time allocated for training of the Village Health Workers (secouristes) is being devoted to rural sanitation. Non-structured interviews with the VHTs in the field indicated poor assimilation of the notions of basic sanitation has been achieved.

The general level of education of workers selected for training permits only the most elementary training in environmental sanitation. Understanding of the link between adequate sanitation and prevention of disease does not appear to have penetrated to the VHT level, or, from there, to rural villages. The problem appears to be that of assimilation of course material rather than insufficient curricula.

In addition to the VHT, the public schools, animation services, and media participate in general environmental sanitation education of the public. There was no evidence that educational materials in sanitation have been developed by the project for distribution to the rural populations through the VHT and the animation service.

There is no indication that the Islamic religious leaders in rural areas have been enlisted in the effort to educate the public to the need for basic sanitation and the means by which it may be achieved.

#### 5.752 Sanitation Agents

Originally, the training program for Sanitation Agents at ENICAS was of one year's duration. Simultaneously, with a decision to increase the training for certified nurses from one to 2 years, the training time for Sanitary Agents was also increased to two years. Greater emphasis on practical training and enlargement of curriculum in public health, sanitation, and supervisory training is now possible.

RHIP outputs call for the training of 75 sanitary agents at the rate of 15 per year over a 5-year period. The new training cycle of 2 years will require adjustment to planned outputs of sanitary agents supported by the project.

Sanitary Agents, upon graduation, will be assigned by the NSHS to municipal, arrondissement, and department levels under the supervision of Sanitary Technicians at Department level. NSHS projects needs for Sanitary Agents at 150 as soon as possible.

Sanitary Agents assigned to dispensaries at arrondissement level are to assist VHTs in promotion of rural environmental sanitation.

#### 5.753 Sanitary Technicians

There are currently 7 fellowships offered by RHIP for the training of Sanitary Technicians in third countries. There are no training facilities for sanitary technicians in Niger. According to USAID mission records, there are 6 sanitary technicians training in Lome and one training in Dakar. The description of the curriculum for the individuals training in Lome appears adequate although no breakdown in course hours is given for this 3-year program. The individual in Dakar, already qualified as a state nurse, is training as a ward-mistress (infirmiere de pavillon) and not as a sanitary technician as understood by NSHS/MOH.

#### 5.754 Sanitary Engineers

First, the evaluation team noted that there is misunderstanding on the part of the MOH as to the qualifications and capabilities of Sanitary Engineers as defined in the American system. This is primarily due to conceptional differences between French and American systems and translation of terms without a complete understanding of these differences. In recent years, the French have created a 2-year technical level course at Rennes which awards a degree in sanitary engineering (ingenieur sanitaire) which is equivalent to an Associate Degree in the

U.S. On the other hand, in the U.S., a Sanitary Engineering degree is considered as an advanced degree usually awarded to civil or hydraulic engineers after 2 years of advanced study. In general, the terms "Sanitary Engineer" and "Environmental Engineer" are used with the same meaning in the U.S.

The point that must be communicated to the GON is that a sanitary engineer trained in the U.S. is fully capable of designing hydraulic and civil works and supervising their construction.

Under the RHIP program, there are 2 individuals training in sanitary engineering in the U.S. One individual will receive a B.S. in Civil Engineering plus an M.S. in Sanitary Engineering at the completion of 6 years of study. The second individual will receive a B.S. degree in Civil Engineering at the end of 4 years of study.

The MOH plans both engineers to be assigned, upon graduation, to the NSHS in Niamey.

#### 5.755 Technical Assistance

Through a contract between the GON and Africare, two Sanitary Engineers are assigned to the project. Although the project is currently in its third year, Africare was able to place one engineer in Niamey only about 6 months ago and the second in Zinder in March of 1981. The sanitary engineer assigned to Zinder was not fluent in French when he arrived in Niger. This has caused considerable concern in the MOH as to his ability to participate in training of Sanitary Agents at ENICAS. The GON proposed to transfer this engineer to Niamey for one year or until his language capability is sufficient for him to resume his duties in Zinder. The team concurs with and supports GON wishes in this regard and believes it a legitimate project expense.

The total funding for this component of the technical assistance is 96 person-months of which 8 have been used to date.

At the request of the Mission Health Development Officer, the evaluation team has developed suggested terms of reference for the 2 sanitary engineers in support of contract negotiations between AID, GON, and Africare. These terms of reference are given in the Appendices of this report.

#### 5.76 Senior Level Training

At the time of evaluation, support for 21 of 25 participants for advanced training had been utilized. Particulars are given in the Appendices. By category 6 state nurses are studying in the Ivory Coast at the Institute for Social Training, 2 physicians are enrolled in an M.P.H. program at Rennes (France), 2 sanitary engineers are in training in the U.S., 5 physicians are in specialty training in Zaire, 2 anesthetists

are in training in Yaounde, one state nurse is at an institute in Dakar for higher education and being trained as a trainer of trainers, and 2 Ministry officials have been sent to an international medex seminar in Honolulu. Expenditures for this training are expected to total \$167,318.

Examination of training obligated to date reveals them generally appropriate. It is too early to assess the degree to which responsibilities upon return of trainees will utilize training provided. During the period available, it was not possible to interview returnees. In view of this, it is recommended that the next RHIP evaluation team address this question and determine whether the return warrants additional funding.

#### 5.77 National and Departmental Level Seminars

Two national seminars have been supported by the RHIP, one in Maradi in August of 1979 which had 95 participants, and a second in Zinder in August, 1980, with 111 participants attending. Proceedings of the second of the Journées d'Etudes de la Santé in Zinder were examined by all team members in detail, and reactions were uniformly positive. The program was conceived, planned and implemented by Nigeriennes and addressed a wide variety of health system topics and problems. The program included a critique of the Five-Year Plan 1979-1983.

The participants came to grips with many particulars, and there was a genuine effort made to examine and devise tentative solutions. The MOH has already implemented a number of the suggestions. The Zinder Journee, the fifth in the series, was given \$29,000 of support from the RHIP for this purpose. At a cost of about \$260 per participant, our view is that this was not only money well spent, but that this activity should in no way have funding support reduced for any reason. If a need should arise to cut, the team cautions against dropping support for an activity which clearly has an impact on the national health policy process.

Similar remarks hold for the Tahoua conference as well, but clearly since of 1979 has improved in importance, attention, and impact, all of which were reflected in the Zinder Journee. People are obviously aware that their participation results in policy changes. The discussion and proceedings reflect this belief. Health workers in the Departments participate actively in the deliberations and commissions and their views are heeded. Good investment. Good return.

Two other national seminars have been held. The first concerned retraining. The second was on methods of training matrones and secouristes. The publication on training also came to grips with key issues. It remains to be seen how many of the decisions can be implemented. The team was unable to locate a copy of the proceedings on retraining and thus could not review it in detail .

Departmental seminars are held using funds designated for Village Health Teams, and it was not possible to review this activity. We sug-

gest the next evaluation, internal or external, review Departmental seminars in some depth. Data does not seem to be available centrally on this activity and planning for information needed may require a few months' lead time and advance communications.

## CHAPTER 6.0 ECONOMIC ANALYSIS AND OBSERVATIONS

### 6.1 Introduction

The difficulties inherent in undertaking economic analysis of health projects, and specifically those in primary health care in the rural sectors of developing countries, are well known and will not be discussed at this time. Instead, a brief critical review of the economic analysis section of the Project Paper will be made and its shortcomings examined by way of background.

Subsequently, we will review the logical framework of the Project Paper to examine continuing validity of assumptions as well as to identify changes which have occurred with goals, objectives, inputs, and outputs.

Next, we shall review accomplishments to date, which will be summarized in a number of tables, accompanied by whatever cost figures could be obtained. This will make possible some comments on project cost-effectiveness, to date, of a number of component activities.

Finally, through an analysis of what has been accomplished and what remains to be done to achieve End of Project Status (EOPS), a determination will be made on whether the EOPS is feasible by the end of project presently projected, i.e. December, 1982. Consideration will be given as to whether sufficient justification exists to recommend any changes in input, output, or terms of reference from an economic standpoint.

### 6.2 Project Paper Review

A careful review of the Project Paper for the Rural Health Improvement Project resulted in an impression that the RHIP was initially conceived as a health sector support grant. Review of the study undertaken by Family Health Care, Inc. strengthened this impression since individual components of what later became the RHIP were much like components of a health sector support grant (HSSG). The team was later told by Mission personnel that, in fact, this project was originally conceived as a health sector support grant but AID/Washington was unable to approve an HSSG request and requested modifications, changing it to a project. Changes made reminded the team's analyst economist of earlier efforts in the agriculture section to marry a number of extension, marketing, and other components to produce integrated rural development projects so as to make packages more palatable during project reviews.

Economic analysis in the RHIP project paper (Section D) begins on page 61 of the statement, "it is our conviction that this project is the most cost-effective approach to the formulation of a rural health deliv-

ery system in Niger." After this statement, the following 5 components are then presumably submitted to a cost effectiveness analysis:

- 1) training
- 2) technical assistance
- 3) logistic support
- 4) equipment and supplies
- 5) construction and renovation

A cost-effectiveness analysis is usually associated with 2 analytical exercises. First comes development of a number of alternatives. Under each alternative a total project cost consisting of summation of component costs is associated with expected benefits. Thus, several alternatives are compared to determine which alternative has a more desirable mix of expected benefits. The second step is a justification to show that, with the recommended alternative, desirable benefits are maximized per dollar invested. In none of the 5 components listed above was such an analytical exercise undertaken. In each one of the 5 sections, statements were made to the effect that each activity to be undertaken under each one of the 5 components was the most cost-effective, without supporting analysis or justification.

#### 6.21 Training

Training is identified as the most important component of the project with a total cost of \$4.7 million; it is claimed that training proposals will benefit the total rural population. In actuality, it would have been more feasible to calculate the beneficiary population based on the number of Village Health Teams trained and placed with USAID funding. The PP indicates a total of 300 VHTs will be trained and placed per year over a 5-year period. Assuming that each VHT serves a rural population of 600, the target beneficiary population would be 180,000 per year or 900,000 in 5 years.

Dividing \$4.7 million by 900,000 potential beneficiaries would result in an investment cost of \$5.22 per beneficiary, a more reasonable way to calculate investment cost per potential beneficiary. This approach also attributes all types of training investments directly to numbers of villages served by VHTs trained with USAID funding.

The PP assumes a beneficiary population of 2.1 million people and training cost as \$2.24 per inhabitant. Essentially, the problem is not whether \$5.22 is a more realistic figure than \$2.24; there is an absence of having examined several alternatives or of justifying the alternatives recommended for implementation. Later, in the PP, the statement was made that, "There is little question that third-country participant training in African schools or universities is a lower-cost method than similar training in the U.S." This may well be true, however, stating it does not by itself justify recommending this approach. A brief analysis of alternative costs of Stateside training and possible value of that training might have been compared with costs of training compared with benefits from training in American institutions. Following such an anal-

ysis, the recommendation could have been made to channel investment costs exclusively to African institutions or perhaps a mix might have been found to be more suitable by sending individuals in some disciplines to the U.S. and others to African institutions. The state of the art as well as technological considerations should be taken into account in identifying training institutions most suitable for Nigerienne trainees. Language considerations need not predominate in all cases.

In actual fact, Nigeriennes have been sent to the U.S. under the RHIP project to study sanitary engineering for 6 years, including both undergraduate and graduate training to the Master's level.

The training analysis continues with the statement:

"It is clear that support of the host country training programs, which were judged to be effective and relevant for nurses working in dispensaries, will be the least-cost solution to increasing rural health manpower."

Firstly, no analysis was undertaken of the curriculum of nurses' training to determine whether any improvements could be introduced. In fact, due to requests of certified nursing students themselves, their training has been extended to 2 years with additional emphasis placed on supervised practice. The analysis further states that "...the project support for 60 students is modest." From the PP it was not clear whether AID-funded students were to be additive to those the government had already planned to train or substitutive in paying for students which the government wanted trained anyway.

Economic analysis of the training component also claims that, since VHTs are voluntary workers, "they provide the lowest cost solution to the delivery of simple health services." The PP asks that this position be taken for granted, without the opportunity of comparing it with one or more alternatives also involving volunteers.

Two other aspects merit attention. The first is the cost of the attrition rate among securistes and matrones; if a large number of securistes leave their villages after a period of time, there may be a substantial loss in funds invested in their training. The second aspect is that, without adequate supervision by GON personnel at departmental and lower levels, the productivity and effectiveness of both matrones and securistes is reduced drastically. Supervision is a cost which should have been analyzed since it is an important part of recurrent costs for which the GON is responsible both during project life and thereafter.

The training component under the economic analysis recommended undertaking a number of studies to expand the data base on VHTs to allow a more refined analysis of cost-effectiveness. It is truly unfortunate that neither the Mission or the GON have found these recommendations worthy of follow-up to date.

The section on cost-effectiveness of the training component ends with the following statement, "The project is based on the design team

conclusion that a system similar to the present VHT delivery of simple health services is the lowest cost and most effective solution for the Sahel." While this may well be true, no analyses at all, not even comparison of qualitative alternatives, were presented that would justify reaching such a conclusion.

#### 6.22 Technical Assistance

In 3 paragraphs, workshops for 2 mechanics and 2 sanitary engineers were described; no estimate was made of the total cost of the technical assistance component. Furthermore, there were no qualitative or quantitative estimates as to benefits expected from the technical assistance. Requirements of the project for technical assistance were not well thought out or projected. Expatriate specialists seemed to be added on as afterthoughts to what initially may have been a package containing commodities, training, and construction.

#### 6.23 Logistical Support

The 2-paragraph analysis under this section of the PP states that 24 4-wheel drive vehicles for 6 departments and 200 Mobylettes were the cheapest transportation possible to meet minimum needs. Without justification, it is doubtful whether this alternative is truly cost-effective over say, the purchase and maintenance of 200 camels for use in the deepest, most remote rural areas. Realities of rural Niger suggest that mobylettes may be useless in many areas, as may be even 4-wheel drive vehicles at times. Furthermore, the GON has always stressed the need to standardize equipment. It would be worthwhile to compare costs, advantages, and disadvantages between Land Rovers, Toyota Land Cruisers, and U.S.-made vehicles such as International Harvester Scouts, Chevrolets, and GMCs, and what was ordered for the project. The economic analysis could well have provided the basis for a waiver request for purchase of the preferred 4-wheel drive vehicles in the same manner that a waiver was requested and granted for Mobylettes. It should be recognized that the justification for the waiver on Mobylettes was not on economic grounds.

#### 6.24 Equipment and Supplies

Four types of equipment and supplies were covered in 4 paragraphs on page 65 of the PP:

- 1) dispensary and health center equipment and furnishings for 220 existing facilities
- 2) drugs
- 3) educational materials and visual aids
- 4) laboratory and refrigeration equipment

The technical assistance component should have indicated the need for 4 expatriate specialists, corresponding to the 4 equipment categories, to provide short-term services to identify needs more specifically, and the need for their return after the equipment was incountry to insure proper usage. Distribution of 50 slide projectors without making provision for slides seems to have resulted in the slide projectors gathering dust on the shelves at Enicas in Zinder.

#### 6.25 Construction and Renovation

The PP has provided for construction of 3 DDS headquarters and 7 dispensaries; the fact that these health establishments will meet an existing need cannot be denied. However, stating this does not constitute an economic analysis of alternatives which could be considered. What trade-offs exist if 10 more dispensaries were to be built instead of the 3 DDS headquarters? With an emphasis on improving rural health, the existence of a dispensary in a remote rural area may have much more of an impact and be more cost-effective than providing spacious DDS headquarters in an urban area.

It is the purpose of an economic analysis to review options and justify recommended alternatives; this was often lacking in the economic analysis section of the RHIP Project Paper.

The last 3 paragraphs of the section on economic analysis were summarized under the title of Conclusions. It was claimed that the project attempts to find low-cost solutions to bottlenecks in the existing system. The economic analysis in the Project Paper ends with the following statement:

"Based on the above analysis, it is felt that the project is economically sound in terms of the benefits expected to be delivered to the rural population, and the selection of the most cost-effective means to deliver these services. Improved health and increased productivity are always hoped for but cannot be quantified until the hard data, to be compiled by this project, can be analyzed."

As far as can be determined, the economic soundness of this project, based on the analysis offered in the Project Paper, is an unknown due to the absence of any type of analysis. It must be admitted, however, that hard data of the type needed for such an analysis may be unavailable or may not exist, thereby compounding the problem.

Before ending this brief review of the economic analysis presented in the Project Paper, it would be useful to discuss recurrent costs mentioned in pages 33 to 35, which pertain to economic analysis but discussed under financial aspects in the Project Paper. Although the high cost of maintaining expatriate physicians is discussed in detail in these pages, little mention is made of the use of physicians in administrative positions which, from an economic point view, represents a waste of resources. Nigerienne physicians are trained at great expense and are few in number; there were 12 in 1977, and there are an estimated 40 now in

1981. If half of these M.D.s are in administrative positions and do little or no clinical work, funds invested in their training are largely wasted. Without clinical responsibility, their utility as physicians deteriorates in 3 to 5 years. To make matters worse, if they are inept administrators but retain positions for political reasons, not only are investments in their training lost, but they do additional damage through mismanagement and bad decision-making, leading to additional loss of resources.

The financial analyst writing on recurrent costs in the Project Paper states, "At the VHT level the personnel are working mainly on a voluntary basis (customary gifts may be donated by patients), but they do not add a financial burden to the MOH except for training and re-training costs, both of which are modest."

In addition to training and retraining costs, which may or may not be modest, one must include the increased cost of supervision of VHTs, as their numbers increase, and additional GON personnel, both on the CM and rural dispensary levels, are needed to provide adequate supervision.

It is doubtful whether the true cost of training and retraining VHTs is truly modest; VHT members are not 10-day medical wonders. Many of them do not even receive a full 10 days of training; they have returned to their villages after 5 or 7 days for a variety of reasons, such as arrival of the first rains, which points out that care should be taken in scheduling training and retraining sessions so that they do not fall during periods when rains are expected.

Many securistes leave their village 6 to 12 months after training in search of higher income-earning opportunities; their selection as well as training may thus benefit from improvement. Thus, the cost per securiste trained should take into consideration a certain attrition rate which, from field visits, seems to be higher in Hausa and Djerma areas than in Tuareg and Fulani areas, for unknown reasons. It may be possible to implement ways to increase the level of knowledge retained by VHT members over time.

The cost of training matrones may be considered modest until one realizes that many matrones retain little of what they learn during their training and often revert to traditional practices upon return to their villages where they have little supervision. One aspect that may be working is the registration of births in the village, which provides data inputs for central health statistics.

## 6.26 Project Evaluation

The Project Paper stated that ongoing evaluation studies will be an integral feature of this project from its very beginning. The focal points of these evaluation studies were expected to be:

- assessment of the quality and status of outputs
- program significance
- verification of schedule activity completion

One of the objectives of these evaluation studies was to be their contribution to assessment, considering the replicability of project components in other developing countries facing similar conditions.

The Project Paper indicated that, through collaborative efforts between USAID and GON, a strategy for an evaluation process would emerge. Such a strategy did not emerge during the first 2 years of the project. The PP indicates that 2 full-scale joint evaluations, the first at the end of the second year, and the second 6 months before the end of the project, would occur. Joint reviews by the Project Manager and his Nigerienne counterpart were indicated for years one two, and three, as well.

Such a long-term and substantially funded project should consider annual evaluation in order for small and large problems to be identified at the earliest possible stage and then acted upon promptly. Consequently, an evaluation strategy, methodology, and implementation plan should have been included under the evaluation arrangements in the PP. It is suggested that annual evaluations be undertaken by project staff, with limited participation by expatriate specialists. The end of project evaluation would consist of a team of 4-5 short-term specialists for a period of at least 3 months, since procedural requirements would consume at least 50% of their time with plenaries, clearances, protocol satisfaction, review of agreements, and other Nigerienne system imperatives.

The PP stated that formal portions of the evaluation studies will be undertaken by PPC/DPRE together with a select number of Nigeriennes. This evaluation team did not find any evidence of communication with PPC indicating that steps were taken to initiate collaborative effort of this type for the purpose of evaluating the project.

With respect to baseline data, the PP stated that AID evaluators from PPC would train third-year medical students in principles and methodology of evaluative research; this seems an unworkable design component. First, project evaluation is a social science discipline, and social science concepts and methodology take substantial time to teach. Second, since medical doctors are in very short supply in this country, utilizing them to collect baseline data and for project evaluation is appropriate only when used for teaching and learning purposes. Thirdly, medical students are usually under a continuous high degree of pressure to absorb medical knowledge and may not be available to undertake baseline activities at times needed or to take social research methodology courses. Fourthly, the Project Paper did not sufficiently emphasize the need and importance of baseline studies to be undertaken before project implementation starts. We contend that any development project funded substantially justifies a baseline study; only with this type of data is it possible to determine whether the objectives of the project have been met at the end of the project. The relation between planned and actual inputs and planned and realized outputs can be analyzed with such information as well. While it is true that many development projects costing tens of millions of dollars do not allocate even one hundred thousand dollars for a baseline study and subsequent evaluations face the problems this team is now alluding to at the end of the project, expert and informed opinion holds this state of affairs to be irresponsible.

It is suggested that the Niger Mission consider funding 2 short-term expatriate evaluation specialists to work with GON health officials on central and departmental levels in training a number of evaluators and

supervisors; this would enable the GON to have its own evaluation capability for health projects. Estimated level of effort required would be 2 persons and 8 person-months to carry out this suggestion.

### 6.3 RHIP/PP Logical Framework Review

The RHIP Project Paper has one Logical Framework with 2 sub-frames. There is the general log frame with a Human Resources Development sub-frame and an Institutional Support sub-frame. Each cell of the main frame is reproduced below, accompanied by brief comments.

#### Project Design Summary

##### Logical Framework

#### NARRATIVE SUMMARY

Program Goal: The broader objective to which this project contributes:

Goal: To improve at low cost the quality of life and working capacity of the rural population (9,000 villages)

Subgoal: By 1982, to provide 3,500 villages with basic health care services.

#### OBJECTIVELY VERIFIABLE INDICATORS

Measures of Goal Achievement:

Increased life expectancy, decreased infant mortality, and decrease in worker incapacity in all rural villages.

Increase in life expectancy, decrease in infant mortality, decrease in worker incapacity in all villages served by VHTs.

#### MEANS OF VERIFICATION

Special Studies:

- 1) Demographic studies; Birth-death rates; life expectancy
- 2) Epidemiological studies (incidence mortality due to major communicable disease)
- 3) Socio-economic studies on worker productivity

## IMPORTANT ASSUMPTIONS CONCERNING LONG-TERM VALUE ON PROGRAM/PROJECT

- 1) Other factors do not prevent or outweigh effect of improved health services, e.g. drought.
- 2) GON continues to adequately support the present policies and strategies for development and improvement of the rural health services system.
- 3) GON continues to support other rural activities, i.e., agriculture, transportation, water supplies, etc.

After field visits and study, the goal and subgoal above still appear very much applicable. One clarification would be useful: USAID funding will be utilized to increase the number of villages with health teams from an estimated existing number of 2,000 at the start of the project to 3,500 by 1982. However, it must be borne in mind that the number of villages with VHTs is increasing not only through support of USAID but also with GON internal sources and possibly with other donor participation. It is possible that, by the end of 1982, total numbers of villages with VHTs may exceed 3,500 by a healthy margin. The government is determined to move ahead with the national program.

Under the OVI/MOGA, increased life expectancy is a long-term characteristic that cannot be measured within the LOP and thus cannot be considered as a true measurable indicator. Decreased infant mortality is a verifiable measure if there are reliable baseline data prior to the project initiation and if there is continuous availability of village-level data. Decrease in worker incapacity in all rural villages is not a measurable indicator given the data gathering presently possible in villages. It is thus doubtful that establishment of VHTs will show measurable increases in life expectancy by 1982 in villages with VHTs without special surveys being undertaken. Decreased infant mortality can also be a measurable indicator only if villages without VHTs are used as control groups, and if data is collected beforehand against which to compare those with VHTs over the LOP.

Three kinds of studies indicated under Means of Verification are very much on target and would be useful. Since they are not funded specifically by the project, however, they represent rhetoric indicating a highly desirable and needed activity that has little chance of realization. These studies have not been undertaken to date and probably will not, or cannot, be undertaken by the end of the project unless they are planned and funded by the RHIP or with other funds allocated by Mission or GON.

Under Important Assumptions, all 3 listed seem valid at the time of this evaluation. There are no factors that dilute, or seem likely to dilute, in future, the importance given rural health care by the GON; GON continues to express strong support and increased efforts towards expansion of rural health delivery services. Support for other subsector activities also continues. The evaluation team wishes to note in passing the importance the GON has given to the Workshop organized to review Niger's needs in Water Supply as part of the International Water Decade.

The USAID Mission would be well advised to look into areas of Niger's water supply needs where it can pioneer a role through undertaking activities other donors have not as yet financed, thereby stimulating additional international donor financing based on AID's initial efforts. Appropriate technology in well digging and drilling, institutional support for improvement of rural water supply and sanitation, manpower development and training programs, the investigation of appropriate hand pumps which can be standardized and manufactured at low cost in country, and are easy to maintain and repair are target opportunities which the Mission should further investigate in the near future.

#### NARRATIVE SUMMARY

##### Project Purpose

A viable rural health delivery system which demonstrates the values of prevention/ early diagnosis/timely curative intervention/proper/ referral.

#### OBJECTIVELY VERIFIABLE INDICATORS

##### Conditions That Will Indicate Purpose Has Been Achieved: End of Project Status

- 1) Annual number of preventable illness decreases by 15%, i.e. malaria, measles, diarrhea, TB, etc.
- 2) Secondary and Tertiary medical symptoms decrease by 10% annually
- 3) 20% increase in medicines consumed at the village level
- 4) Increased villages' awareness of preventive health care techs
- 5) By 1982, at least 1/3 of rural population within 10 miles of a medical station

#### MEANS OF VERIFICATION

- 1) Review of health records
- 2) Review of health records
- 3) Survey records of VHTs on sampling basis
- 4) Field observations of VHTs and evaluation of knowledge and practices of health promotion, disease prevention, and curative care
- 5) Site surveys in selected areas.

## IMPORTANT ASSUMPTIONS

### Affecting Purpose-to-Goal Link

Allowances will be made for spurious effects of improved reporting and case finding.

The project purpose remains valid. The conditions that will indicate purpose have been achieved, i.e., EOPS are admirable but not measurable, given the absence of both baseline data prior to project implementation as well as the absence of studies and mechanisms to determine percentage changes over time. Condition number 4 of increased village awareness of preventive health care techniques is an important factor being ignored at the present time. Village Health Team members are trained to provide medications for infirmities diagnosed by securistes, to report epidemics, or arrange medical evacuations, and register a certain number of events in a book. Little preventive work is being done by securistes or matrones insofar as the evaluation team was able to determine during the field visits and interviews.

The Means of Verification specified are valid, however, the project does not have either expatriate or GON personnel to continuously monitor health records or undertake surveys to verify EOPS. The assumption affecting the purpose-to-goal link seems valid and has been the subject of discussions with GON officials during plenary sessions. However, no strategies have resulted to determine the nature of quantity of allowances that must be made for spurious effects of improved reporting and case finding.

## NARRATIVE SUMMARY

### Outputs

#### A. Trained health personnel

- 1) Increase in the number of trained and retrained VHTs
- 2) Increase in the number of academically trained health professionals working at all levels for rural health delivery system
  - a) These health professionals will continue to acquire new skills and new theories relevant to health needs of community through continuing education progress
- 3) MOH will have a group of health and auxillary support personnel trained in such areas as health administration and planning, driver education, etc.

#### B. Institutional Support

- 1) Functioning transportation system reponsive to supervisory visits and distribution of goods and services between the VHTs and

health professionals and health care facilities

- 2) 35% of rural population will receive improved drugs and supplies
- 3) Increase in the control and surveillance of communicable disease in Niger
- 4) Functioning health/nutrition education program in all health centers, PMs, rural dispensaries, and villages served by VHTs
- 5) Functioning environmental sanitation program in rural areas

#### OBJECTIVELY VERIFIABLE INDICATORS

##### Magnitude of Outputs Necessary and Sufficient to Achieve Purpose

- 1) 1,500 (6,000 persons) trained VHTs; 13,500 VH workers retrained
- 2) 25 teachers/senior PM officials  
200 certified nurses  
100 state nurses  
175 medical students  
75 sanitarians
  - a) 1,100 persons participated in MOH conferences and seminars
- 3) 5-10 trained specialists in specific health or related areas

##### Institutional Support

- 1) 42 functioning 4-wheel drive vehicles  
200 Mobylettes for supervisors between dispensaries and villages
  - a) 45% increase in supervisory visits
  - b) 10% increase in operational efficiency in all vehicles
- 2) a) 3,500 VHTs equipped with drugs and supplies  
b) established and functioning:
  - 7 new dispensaries
  - 2 Department centers (Agadez and Zinder) with 2 garages and repair workshops
  - 220 existing health facilities newly furnished and equipped
  - sanitation improvements made in 220 health facilities
- 3) 80% rural population immunized

#### MEANS OF VERIFICATION

- 1) census of VHT
- 2) MOH records including vehicles and medical equipment records and field observations and reports
- 3) MOH records and field observations
- 4) MOH records, field observations, and evaluation of curricula
- 5) MOH records and field observations
- 6) MOH records and field observations

### IMPORTANT ASSUMPTIONS

#### Affecting Purpose-to-Purpose Link

- 1) The MOH will give highest priority to training of managerial and health personnel at all levels
- 2) The MOH will be capable of and responsible for maintaining the logistical support system
- 3) The MOH will insure staffing and equipping of new construction
- 4) The MOH will give high priority to planning and implementation
- 5) Villagers will continue to react favorably to VHT
- 6) VHT members will perform as expected
- 7) The MOH will emphasize health/nutrition education as a component of health services for the rural population
- 8) The MOH will give high priority to the surveillance and control of communicable diseases

#### 6.31 Trained Health Personnel

The USAID-funded effort has resulted in an increase in the number of trained and retrained Village Health Teams. Problems encountered primarily involved a longer time to mobilize manpower and commodity resources need than initially anticipated. Wholly insufficient expatriate manpower resources have been employed and have been limited to one American specialist, initially hired on a personal services contract and then converted to direct-hire, resulting in additional responsibilities at Mission level. A series of problems observed in the field revolving around qualitative and quantitative aspects of training and retraining provided by GON to VHTs have been identified. The team agrees:

- a) There has been insufficient planning in determining the content of the training courses. Methodologies used and modern educational technologies need to be introduced to increase retention of information and skills imparted to VHT members during training.

- b) The training period is insufficient. Arguments and reasons against prolonging the training to 15-20 days have been duly noted. It would nonetheless be highly desirable to experiment with a group of 100 secouristes and 100 matrones from different arrondissements of the same Department, subjecting them to 2 shorter training periods of 8 days each, separated by 6-8 months, thereby increasing training without keeping them away from home for too long a period.
- c) The same problem applies to retraining sessions; it was noted that retraining is irregular. While some persons are retrained every 2 years, others have not been retrained for 5 years or more. Retraining every 2 years leaves too long a period for learned material to be forgotten and, for matrones, the probability of reverting to traditional methods is too great. It would be worthwhile to experiment with 10-12 day retraining sessions for all matrones and all secouristes on an annual basis.
- d) Both training and retraining sessions are abbreviated due to weather conditions and other undetermined reasons. During the field trips, we observed a relatively large number of secouristes and matrones who had had total training or retraining times of less than 10 days, mostly ranging from 5-8 days.

The increase in numbers of academically trained health professionals working at all levels in the rural health delivery system project has been noted. However, there was a long delay between the signing of the PROAG and the draw-down of funds for all training activities, especially those activities involving training by academic institutions in country. This may be due to the following reasons:

- a) lack of an assessment by the Mission as to the ability and capability of the GON in general, and the MOH in particular, to absorb project resources in a timely fashion.
- b) lack of a procedure under which the RHIP would be staffed with a sufficient number of full-time Nigerienne and expatriate staff trained in compliance with GON and USAID regulations in terms of financial records and accountability, procurement and customs clearance, a need for a proper manpower study prior to distribution to training facilities around the country in an equitable fashion, with minimum political considerations, and distribution based on need.

The continuing education in health funded by USAID seems to have yielded limited results. Provision of expatriate manpower resources on a short-term basis, working closely with host-country personnel to produce competency-based training in primary health care services, would increase effectiveness and desired impact of this project.

The Magnitude of Outputs necessary and sufficient to achieve purpose lists number of individuals expected to be trained with this project's funds. Numbers of individuals trained to date with project funds are an-

alyzed later in this chapter. We would like to touch upon 2 items, however. The number of medical students trained in rural health aspects was indicated to be 175. This is an impossible number to achieve, given the fact that the first class to graduate from the University of Niamey Medical School, at the writing of this evaluation report, will be 7 in 1981. Thus, the EOPS on medical students trained by the end of the project should be scaled down to 25-30 medical students. The number of sanitarians to be trained, according to the logical framework, is 75; at this moment, it does not seem possible to have this number trained by the end of 1982. If project life is extended to December, 1984, however, the probability of having this number increases substantially.

Means of Verification to measure the outputs in training is given as the VHT census, MOH records, and field observations. This is on target except that there is no indication that anyone on the project staff is assigned responsibility to continuously monitor the MOH records. Furthermore, the team strongly and emphatically stresses the need for a full-time Nigerienne Project Director, advised by a senior expatriate advisor serving in the role of Chief of Party, and by a number of long- and short-term advisors who will work to insure the flow of inputs and outputs. The present use of a direct-hire Health Development Officer to straddle the roles of Health Officer, representing the Mission, and Chief of Party, for the project, seems an unwise arrangement. The role conflicts inherent in such an arrangement cannot readily be resolved. Additionally, there is too much work for a single individual. The Health Officer should not be expected to be a technical colleague of the MOH and also the AID representative who enforces U.S. requirements.

Length and frequency of field observations by various members of the project staff, both expatriate and GON, should be incorporated into a detailed work plan to guide activities for the remainder of project life.

Important Assumptions affecting output-to-purpose link are still valid, though some only to a limited degree. The evaluation team is convinced that the MOH does give the highest priority to the training of managerial and health personnel at all levels. However, it does not follow that the MOH has devoted sufficient numbers of qualified and full-time personnel for proper implementation of the RHIP. The lack of a full-time Project Director is the most striking example.

The MOH still has not developed the capability and responsibility for maintaining a smoothly functioning logistical support system. Supply of medicines down to the dispensary level seems to be working fairly well. The ONPPC central supply operations and Popular Pharmacy network is well organized; however, resupply of medicines to VHTs requires improvement.

As far as vehicle repair and maintenance is concerned, the expatriate mechanics are not given sufficient support to train the number of mechanics expected and able to continue operation of a well-equipped shop after the project has ended. The MOH has not placed sufficient importance on the training function of expatriate mechanics but prefers to use them as skilled workers needed to keep the vehicle fleet in opera-

tion. The productivity and efficiency of these mechanics have, in turn, been directly related to the strength of support they have received from their departmental DDS and from project headquarters in Niamey. Africare does not seem to backstop its people very well or show concern for project-related problems.

The team does not have confidence that the MOH will insure staffing and equipping of new construction in a timely fashion. Observation in the field suggests the Project Director has no well worked out plan to equip and staff new health structures. Equipment and supplies are not speedily cleared from customs, inventoried or distributed, and tend to remain in warehouses for long periods. Some evidence was observed of political-administrative favoritism in the distribution of supplies such as the distribution of new vaccine jetguns almost exclusively in the Niamey Department, when other Departments' equipment (e.g., Agadez) were in very poor condition.

There is little evidence in the field of efforts to improve environmental sanitation. The team, however, agrees with the assumption that a high priority to planning and implementation of measures in this subsector will continue to receive priority attention by the GON.

The assumption that villagers continue to react favorably to VHTs was found valid. The assumption that VHT members will perform as expected seems valid to a large extent; there are exceptions. Attrition is common among securistes who leave their village in search of employment. Knowledge retention levels seem low, with less retention among matrones than securistes. VHTs are active almost exclusively in the curative areas and do little in prevention, sanitation, and hygiene activities.

The team observed scarce evidence of MOH emphasis on health/nutrition education as a component of health services by VHTs for the rural population. PMIs which are increasing in number do a good job. The health/nutrition component of VHT training seem weak.

The assumption that the MOH will give a high priority to the surveillance and control of communicable diseases seems valid.

### 6.32 Institutional Support

There are four outputs expected in this support category. The RHIP can expect only to make a partial contribution to resolving the dual problems of facilitating a well-functioning transportation system and improving supervision needs for VHTs and other echelons of the health system. In the absence of proper planning and absence of emphasis on driver education, the life of the vehicles and Mobylettes provided has been short, much shorter than project life. It has also been observed that, in many parts of the country, Mobylettes are useless in off-road travel for supervisory visits to remote villages. Mobylettes seem more like an urban luxury than a rural necessity given the rough conditions of the terrain in rural areas of Niger.

That 35% of the rural population will receive improved drugs and supplies seems a reasonable output to expect only if organizational and manpower bottlenecks are resolved. Increase in the control and surveillance of communicable diseases in Niger will require the addition of one or more Nigerienne or expatriate epidemiologists in the central offices of the MOH and preferably at each department, working with local health professionals such as state or certified nurses of Sage Femmes. It is hoped that expatriate epidemiologists, during the remainder of project life, will be able to train at least 14 GON health professionals who would continue surveillance work after project end without the need of further expatriate help.

Functioning health/nutrition education programs in all health centers, PMIs, rural dispensaries, and villages served by VHTs does not seem to be a reasonable output to expect from this project during its life. There does not seem to be a GON emphasis on this type of education program Ministry-wide. Functioning environmental sanitation programs in some rural areas of the country will be possible by the end of project life.

Under the Magnitude of Outputs necessary and sufficient to achieve the institutional support component of the project, the supply of vehicles and Mobylettes is an objectively verifiable indicator (OVI).

A 45% increase in supervisory visits assumes installation of a smoothly operating information gathering system. Furthermore, the team has observed that the definition of a supervisory visit as defined by MOH personnel is faulty, and thus the quality of supervision is deficient. Supervision, according to field observations, consists of checking and counting of receipts and medical supplies and examining the register books of securistes and matrones. The supervision does not include discussion on health status of the village or other problems, and the supervisor does not use the visit to check the volunteer's knowledge or attempt to refresh it. Even if a 45% increase in supervisory visits should be observed by end of project, unless the nature of supervision is improved, its true utility will be minimal.

A 10% increase in operational efficiency for all vehicles may be possible if a well-functioning shop exists in all departments, with sufficient numbers of local mechanics trained by expatriate instructors. All remaining OVIs seem reasonable except for the last one. To attain a level of 80% of the rural population immunized against communicable diseases will require a vast improvement in the logistical supply and delivery system of vaccines as well as vast improvements in the delivery of services by Mobile Teams. The DHMM has organizational or leadership problems and project outputs will be affected as a consequence.

#### Inputs: Activities and Types of Resources (Total by 1982)

##### A. Human Resources Development

##### Training for Health Personnel

- 1) Third-country participant training in Africa or Europe for

teachers for academic health institutions, senior MOH public health officials, etc.

- 2) Incountry training for MOH health personnel
  - a) VHT in training/retraining for all VHT workers
  - b) certified nurses in training at ENICAS
  - c) state nurses in training at ENSP
  - d) rural health field training for medical students from ESSM

#### Technical Assistance Trainers

- 1) auto mechanics
- 2) medical equipment repair
- 3) sanitary engineer
- 4) short-term consultant

#### B. Institutional Support

- 1) Logistics equipment
  - a) 4-wheel drive vehicles and parts
  - b) Mobylettes
- 2) Equipment and supplies (back-up level) for VHTs
  - a) drugs for VHTS
  - b) educational materials and audio-visual for VHTs, health centers, and dispensaries
  - c) equipment and furnishings for existing health centers and dispensaries
  - d) equipment for garages and medical equipment repair workshops in Zinder and Agadez
  - e) lab equipment and cold chain equipment for mobile health units
  - f) vaccines for mobile health unit
- 3) Construction/Renovation of health care and supporting facilities
  - a) Department Centers in Agadez and Zinder
  - b) new dispensaries
  - c) environmental sanitation improvement of existing dispensaries and health centers

#### Level of Effort/Expenditure for Each Activity (Total by 1982)

##### People/Students

- 1) 25
- 2) a) 6,000  
13,500
- b) 200
- c) 100
- d) 175

Trainers (person/years)

- 1) 8
  - 2) 4
  - 3) 8
  - 4) 2.5
- 
- 1) Vehicles
    - a) 42
    - b) 200
  - 2)
    - a) teams equipped - 2,773
    - b) teams equipped - 3,500
    - health centers and dispensaries - 1,100
    - c) 220 HC and dispensaries
    - d) 2 garages
    - 2 workshops
    - e) 21 mobile units
    - f) 500,000 people
  - 3)
    - a) 2 centers
    - b) 7 dispensaries
    - c) 220 health centers and dispensaries

MEANS OF VERIFICATION

- 1) Orders and receiving reports

Affecting Input-to-Output Link

- 1) Human Resources Development
  - a) That the MOH will establish sound criteria for the selection of types and numbers of personnel to be trained/re-trained at all levels
- 2) Technical Assistance
  - a) that qualified French-speaking technicians are available
  - b) that the MOH will provide qualified counterparts
- 3) Logistics and Equipment
  - a) that all commodities can be totally absorbed and utilized by the MOH
  - b) that qualified personnel will be available and trained to maintain and operate equipment and transportation provided
  - c) that the GON will contribute administrative and operative costs from budgeting resources.

### 6.33 Human Resources Development

All inputs in human resources development have been subject to delays primarily due to the time the GON had needed to organize its own resources to manage the project. Secondly, initial design of the project counted on one expatriate liaison officer instead of several long-term expatriates working exclusively on the project. The training component of the human resources development input seems on track.

Technical Assistance instructors seem to suffer from a number of chronic problems. One expatriate auto mechanic has a well organized operation and has organized a continuous supply of needed spare parts; he is in the process of training 3 apprentices. The second mechanic, however, has had difficulties in both areas. The first mechanic has had full support of his DDS while the latter has run into administrative problems. The medical equipment repair technician arrived only several weeks before the arrival of the evaluation team; brief contacts with him have shown he does not have sufficient knowledge of French. He will be of limited value until he learns French, Hausa or Djerma. The 2 sanitary engineers also arrived shortly before the arrival of the evaluation team and were settling in while this evaluation was being undertaken. They seem qualified for their duties.

The evaluation team, in another section of this report, makes recommendations for additional long- and short-term expatriate specialists. It is recommended that these should not be contracted through Africare. The team feels a different contracting mode should be used for these additional technical assistance manpower inputs; present operating policies of Africare seem to compromise or diminish effectiveness of their people.

### 6.34 Institutional Support Inputs

The problems involved with logistics and equipment have been mentioned earlier. Insufficient attention has been devoted to needs identification for equipment and supply procurement and delivery. As to educational material and audio-visual equipment, the evaluation team discovered that, although a number of projectors were supplied by RHIP, no slides or films were made available; the projectors sit shelves virtually unused. There is an apparent need for an expatriate audio-visual specialist working closely with the Nigeriennes to determine specific needs at each training level and to respond to them by developing or obtaining needed materials, teaching simple maintenance and repair, and, most importantly, getting appropriate material to be used with the equipment. Failing availability, appropriate materials can be developed with assistance on site.

All the other inputs under institutional support arrived after substantial delays. Spare parts ordered with original equipment did not arrive with the new equipment and were backordered by the supplier for over a year. Short-term services of an expatriate or AID procurement

specialist working in the U.S. and Niger, and possibly Lome, could advance delivery. Levels of effort of the RHIP in terms of OVIs will not be possible due to delays encountered during the first 2 years of the project. A justification to extend the project to December, 1984, is closely related to the time needed to achieve intended outputs of the project as indicated in the Logical Framework.

The last item in the general frame is the assumption affecting the input-output link. Most of these assumptions seem invalid at the time evaluation took place. They will be reviewed individually below.

1) Human Resources Development

- a) Observation in the field and interviews with GON/MOH personnel at the central and departmental levels have indicated that the MOH has been extremely slow both in establishing selection criteria for training and retraining at all levels and in implementing these criteria at the operational level. This is more obvious at the level of VHTs than with higher-level personnel trained with USAID funding. Selection criteria for matrones and securistes are in need of improvement to reduce attrition.

2) Technical Assistance

- a) Qualified French-speaking technicians are available both in the American marketplace as well as in other countries acceptable to USAID. However, the combination of particular skills with fluency in French commands a higher price which must be paid if specialists are to arrive at project sites on time. Contractors that keep wages and the total income and benefits package too low either will experience long delays in successful recruiting or will have to mobilize individuals without sufficient experience and without the needed language skills. Additionally, scarce qualified expatriate personnel need good backstopping and home office support by qualified professionals in headquarters. All these factors were taken into account in making the recommendation that the Mission consider another contractor for additional technical assistance recommended in this evaluation report. Should the Mission add additional staff to those serving under Africare in Niger, continuation of problems associated with manpower and backstopping observed during this evaluation is assured unless the basic contract is substantially improved and modified.
- b) GON/MOH has been unable to provide qualified counterparts for existing expatriate specialists. It is not known whether this is a consciously adopted policy based on utilizing expatriate skills while available. Perhaps it involves a willingness to do without them when they are gone or may reflect a low priority assigned by the GON to training of counterparts by expatriate technicians. Whatever the reasons, it is extremely important that counterparts be assigned both the Africare experts as well as to those recommended in this evaluation report if project impact is expected to continue past project completion.

#### 6.4 Economic Aspects of the RHIP Evaluation

This section deals primarily with economic aspects of project accomplishments to date. The analysis is based on 3 sources of information. Background data was obtained from documents made available by USAID and GON. A table of relevant data was partly completed by GON/MOH/RHIP management and returned 2 days before team departure to the U.S. The Third source was through first-hand observation of conditions in the field during a 14-day, 4,500 kilometer field visit which took the team to 6 of 7 Departments of Niger.

This analysis is somewhat incomplete. The reader must bear in mind that the major portion of discussion and analysis of economic aspects of this project awaited delivery of appropriate data from the GON as well as draft completion of the write-up of other team specialists so as to determine cost implications of their recommendations. This caveat is not an apology but a description of a series of conditions and constraints, including time under which the evaluation team had to function.

##### The State of Health Planning in Niger

In order to present a brief but comprehensive overview of health planning and accomplishments in Niger, it would be useful to go back 2 decades to 1960. During the first half of the 1960's, GON health policy had an individual, curative orientation. From 1965 to 1974, the orientation changed to one in which emphasis on preventive medicine and substantial decentralization of health care took place in order to increase availability and accessibility of health care to rural areas. It was difficult to reach goals established in the Ten-Year Plan due to a number of bottlenecks. There was an unequal distribution of the few existing qualified health personnel within the country, and there were budgetary constraints which prevented provision of mobile health care to rural areas. An increased emphasis on preventive as well as maternal and child care was not possible when the largest proportion of funding was expended in the hospital subsector.

In 1970, health expenditures in the public sector were CFA 250 per capita, 12% of which was allocated to preventive and maternal and child care. This was an increase from the 7.5% of the period 1963-1970, but under the 14.6% of the 1971-1974 period.

The third planning cycle was a 3-year program for the years 1976-1978. There was renewed emphasis on preventive and mobile health care, with an attempt to integrate these with curative care and health education. Investments in health during 1976-78 were budgeted at CFA 3.9 billion. Not all projects designed for implementation during this 3-year period were realized. A number of changes were made replacing earlier planned projects with others.

The number of villages with VHTs increased from 275 in 1972 to 1,041 in 1976 and continued a steady growth reaching 1,423 in 1977. The slowest growth occurred in 1978 where the number of villages increased by 73 to 1,496. The number of secouristes increased from 500 in 1972 to 1,423 in 1976, an almost 3-fold increase. In 1977 there were 2,014 secouristes and in 1978, 2,185. The number of matrones during this period followed closely the number of secouristes but stayed below it each year. There were 594 matrones in 1972 serving at 275 villages. Their number went up to 1,192 in 1976 serving at 1,041 villages. It is interesting to note that, in 1972, there were 2.16 matrones per village. In 1976, this had fallen to 1.14 per village. In 1977, there were 1,686 trained matrones serving in 1,423 villages and, in 1978, 1,836 matrones in 1,496 villages, giving 1.18 and 1.22 matrones per village, respectively.

The distribution of secouristes and matrones in 7 Departments of Niger and the coverage at each Department is given below.

The state of VHTs was as follows at the end of 1978.

TABLE 14

<u>Department</u>	<u>Secouristes</u>	<u>Matrones</u>	<u>Inhabitants per VHW</u>
Agadez	62	26	1,500
Diffa	116	36	1,120
Dosso	267	282	1,290
Maradi	635	536	830
Niamey	612	375	1,230
Tahoua	273	409	1,490
Zinder	220	172	2,630
Total (Niger)	2,185	1,836	1,300

Source: Plan Quinquennal de Developpement Economique et Social, 1979-1983 Ministere du Plan, Republique du Niger, Tableau No. , p. 403

The unique aspects of the primary health care system in the rural sector in Niger could be summarized as follows:

- 1) an emphasis on utilizing trained volunteers
- 2) an emphasis on self-reliant training and development (auto-encadrement)
- 3) an emphasis on community self-sufficiency in primary health care

The self-reliant training and development (auto-encadrement) approach is characterized by the following features:

- a) promotion of adequate nutrition
- b) provision of accessible, safe water
- c) adoption of basic sanitation measures
- d) improvements in maternal and child care including family planning
- e) health education with emphasis on major problems

The distribution of health facilities in terms of infrastructure and manpower resources is summarized in Table 14.A.

As can be seen in Table 14, the distribution of health services, both in terms of infrastructure and manpower, favors certain departments and especially a limited number of urban centers such as the city of Niamey, where the ratio of population per medical doctor is the lowest in the country, with one physician per 5,600. Of course, the planning document does not indicate that a substantial number of these medical doctors are in administrative positions and have no opportunity to practice medicine. It would have been more illuminating had the plan differentiated between practicing physicians and those in administrative positions.

Unfortunately, in many Ministries of Health in developing countries, there is a usual bias in favor of utilizing physicians in administrative positions. Economists believe this is not cost-effective approach in utilization of the substantial investment made in medical education. Many functions in a Ministry of Health can suitably be undertaken by individuals who are not physicians and scarce physician resources can be utilized in direct health care interventions.

Of the 40 Nigerienne physicians in the country in 1981, it was the team's impression that close to half were involved in administrative work on a full- or part-time basis. The GON/MOH would be well advised to reconsider its policy of using physicians in administrative positions and give consideration to replacing a number of them with graduates of public administration, with state and certified nurses, and with other administrators and health professionals.

### The Health Budget

Total health expenditures by the public sector almost doubled between 1975 and 1978, increasing from CFA 1.14 billion to CFA 2.36 billion respectively. As far as the percent of health expenditures within the national budget was concerned, there was no change between 1975 and 1978, staying at 7.8%. However, there were slight changes in the intervening years, i.e. 8% in 1976 and 7.7% in 1977.

As seen in Table 15, impressive increases over the 4-year period have been investments in health financed by the National Investment Fund (FNI). These investments increased from CFA 115.4 million to CFA 552 million, an almost 5-fold increase. Despite the fact that FNI investments were around 3-5% during this period, the absolute increase in

TABLE 14A

## Health Coverage, 1978

Departments	Doctors	Persons/ Doctor	Beds	Persons/ Bed	Dispensaries, Medical Centers	Persons/ Dispensary
Agadez	8	16,500	156	850	16	8,300
Diffa	6	28,300	139	1,220	14	12,100
Dosso	5	141,900	246	2,900	28	25,300
Maradi	13	74,700	427	2,270	26	37,400
Niamey	46	26,300	1,070	1,120	52	23,300
(City of Niamey)	(44)	(5,600)	(899)	(270)	(9)	(27,500)
Tahoua	9	112,800	512	1,980	32	31,700
Zinder	16	64,400	603	1,710	29	35,500
Niger	103*	50,900	3,162	1,650	197	26,600

\*This number does not take into account the 15 doctors transferred to administrative services or training.

Source: IBId Table NO. 2, p. 404

TABLE 15

## Title III: Resources by service categories (FCFA millions)

	1975	1976	1977	1978
- Personnel	599.60	717.55	863.30	1,072.42
Material and supplies				
Delivery of health services and equipment including medicines	467.07 (315.0)	792.57 (454.0)	811.18 (476.7)	905.81 (530.0)
Transportation	74.0	155.35	207.95	228.40
Public service allocation (Title II)	0.75	0.80	0.80	0.85
Total material	541.82	948.72	1,019.93	1,135.06
Total title III	1,141.42	1,666.27	1,883.23	2,207.48
Title IV Public Interventions (sector investments)				
Social Action	1.50	1.50	141.50	160.0
Total health investments	1,142.92	1,667.77	2,024.73	2,367.48
Total Government budget	14,731.30	20,904.80	26,175.10	30,404.0
Health expenditures as a percentage of the total government budget	7.8%	8.0%	7.75	7.8%
FNI investments in Health	115.40	120.45	250.00	552.0
FNI total investment budget	2,320.12	3,405.80	8,000.0	12,000.0
FNI health investments as a percentage of total FNI investments	5.0%	3.5%	3.15	4.2%

Source: IBID p. 406

investments in health is proof of the importance placed by the GON on the health sector.

Thus the situation from 1960 to 1978 indicates a changing emphasis from curative care to a combination of curative and preventive care, steady increases in investments in the health sector, increasing attention to mobile health care, and making primary health care services available to the smallest population clusters (villages) through village health volunteers.

### The Five-Year Economic and Social Development Plan 1979-1983

#### General Goals and Objectives

The general objectives of the 3-year program of 1976-1978 were the freeing of natural factors and resources in the Nigerienne economy, installation of a society on the road to development, and the search for an independent economy. The 1976-1983 Five-Year Plan will pursue the same objectives with the addition of one more objective of the highest priority which is self-sufficiency in food; this considered to be first priority of the GON development policy. Consequently, the objectives of the Five-year Plan are the research into self-sufficiency in food production, the installation of a development society, and research into the formation of an independent economy.

#### 6.5 Project Outputs and Cost-Effectiveness of Disbursements to Date

In order to undertake as complete an analysis as possible, the team economist submitted tables to GON officials 10 days after arrival in Niger. It was agreed that as much of the requested data as possible be compiled during the following weeks while the team made a field trip to 6 of the 7 Departments in Niger.

The tables were returned 2 days prior to the economist's departure with little more data than had been made available the second week after the team's arrival. In consequence, the analysis that follows is limited and based upon scanty information and, as mentioned earlier, on data gleaned from observations during the field trip.

Table 16 lists 6 Departments in which RHIP funds were utilized for training and retraining of securistes and matrones. Unfortunately, costs of training and retraining these 2 types of volunteers are combined making it impossible to differentiate between training and retraining costs, if these differ. Thus, for analytic purposes, it is assumed that training and retraining costs are the same but change from year to year as result of increasing costs and inflation.

Table 17 was prepared based on Table 16 in order to derive an estimate of magnitude of costs of training and retraining.

In the Department of Tahoua, there were 350 securistes and matrones trained in 1979 at a cost of CFA 2 million. The cost per individual

TABLE 16

<u>Department</u>	<u>Year</u>	<u>No. of Sec. &amp; Matr. Trained/ Retrained</u>	<u>Total Cost Million CFA</u>	<u>CFA Cost/ Individual Trained</u>	<u>Training Cost/ Capita of Est. Beneficiary</u>
Tahoua	1979	350	2.0	5,714.3	19.0
	1980	486	9.3	19,135.8	53.8
Zinder	1979	231	2.0	8,658.0	28.9
	1980	390	6.4	16,410.3	
Maradi	1979	220	2.0	9,091.0	30.3
	1980	335	14.5	43,283.0	144.3
Dosso	1979	178	5.9	33,146.0	110.5
	1980	814	10.0	12,285.0	41.0
Niamey	1979	174	6.3	36,206.0	121.0
	1980	356	6.5	18,258.0	60.9
Agadez	1979	28	4.2	150,000.0	500.0
	1980	43	4.1	95,349.0	317.8
Total-1979/80		3,605	69.1	19,167.0	63.9

Source: GON/MOH Plenary Evaluation Session, March 25, 1981

trained was CFA 5,714.3. The training cost per capita of estimated beneficiary was CFA 19. In 1980, there were 486 individuals trained at a total cost of CFA 9.3 million. The cost per individual trained almost quadrupled to CFA 19,135.8. The training cost per capita of estimated beneficiary jumped to CFA 53.8. Since no explanation could be found for such a dramatic increase in training cost, it suggested that, for the remainder of the project life, much more careful and detailed accounts be kept to trace and explain cost increases. This situation of dramatically higher costs in 1980 over 1979 is similar in the other Departments with notable exceptions of Niamey, Dosso, and Agadez, where 1979 costs are much higher than those of 1980. Thus, in Tahoua, Zinder, and Maradi, 1980 training costs increased substantially, tripling for Tahoua, doubling for Zinder, and almost quadrupling for Maradi. On the other hand, in Dosso, the 1979 cost per individual trained was almost 3 times that of 1980, in Niamey, twice that of 1980, and in Agadez, one and one-half times.

As a further example of analyzing training costs, we have presented training projections provided by GON and the associated cost estimates. Thus, in the example worked out for Tahoua, the cost per trainee increases from CFA 25,000 in 1980 to CFA 42,788 in 1983.

Table 17

USAID/Niger Project #683-0208

VILLAGE HEALTH TEAMS

<u>Department</u>	<u>Year</u>	<u>Training</u>		<u>Retraining</u>		<u>Total (trng/retrng)</u>	<u>Cost</u>
		<u>Secouristes</u>	<u>Matrones</u>	<u>Secouristes</u>	<u>Matrones</u>		
Tahoua	1979	50	51	109	140	350	2,000,000
	1980	55	101	124	206	486	9,300,000
Zinder	1979	120	-	-	111	231	2,000,000
	1980	219	171	-	-	390	6,400,000
Maradi	1979	15	28	70	107	220	2,000,000
	1980	107	49	99	80	335	14,500,000
Dosso	1979	107	71	-	-	178	5,874,545
	1980	285	299	121	109	814	10,000,000
Niamey	1979	94	52	16	12	174	6,300,000
	1980	146	95	60	55	356	6,500,000
Agadez	1979	19	9	-	- 28	38	4,200,000
	1980	18	-	16	9	43	4,128,355
Total		1128	926	615	829	3609	69,074,540

Number of villages affected: 1979.....300  
1980.....815

Table 17 (Cont'd)

		<u>Sec. to be trained</u>	<u>Cost of Trng.</u>	<u>Cost/trainee</u>	<u>Sec. to be retrained</u>	<u>Cost of retrng.</u>	<u>Cost per trng/retrng</u>	<u>Cost of Supervision</u>	<u>Super Cost/ trainee</u>
Tahoua	1980	181	4.6(59.3%)	25,000	128(12.4%)	0.96	7500	2.195(28.3%)	7,035
	1981	207	6.21	30,000	173	1.557	9000	3.354	8,826
	1982	232	8.584	37,000	221	2.3868	10,8000	4.8808	10,774
	1983	254	10.8682	42,788	269	3.387	12,591	6.50336	12,434
	Total	877	30.2622	34,506	781	8.29	10,614	17.33316	10,454

<u>Year</u>	<u>Total Cost (thousands CFA)</u>	<u>Cost/Sec. Trainee T and RTs</u>	<u>Number of T and RTs</u>
1980	7,755.00	24,855	312
1981	11,121.00	29,265	380
1982	15,851.60	34,992	453
1983	21,158.55	41,272	523
Total	55,886.16	33,706	1658

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One of the purposes of this brief analysis is to point out that the cost of VHTs is rising and is not such an insignificant item considering that:

- 1) the government is investing its own resources in training se-couristes and matrones in addition to those being trained by other donors such as AID
- 2) As the number of VHT increases, unless the selection, motiva-tion, training, and retraining is strengthened, a high rate of attrition will lead to a very substantial loss of resources. These losses have already been mentioned in the Five-Year Plan 1979-1983.

As the number of health volunteers increases, there will be a need for additional supervisory manpower which has a training cost as well as a maintenance cost in terms of increasing recurrent costs of paying the supervisors' salaries, field travel, and depreciation, operation, and maintenance of vehicles used for supervisory visits. Existing supervi-sion, the team economist's opinion, leaves much to be desired. Strength-ening existing supervision all the way from the direct supervisors of VHTs to division heads in the central offices of the MOH will add one category of costs, and increasing the numbers substantially to maintain the effectiveness of the VHTs will represent a different category and magnitude of costs.

#### 6.51 VHT Training

Since training was identified in the Project Paper as the most im-portant component of this project, this section was started with a dis-cussion of the training costs of health volunteers, something minimized in the Project Paper. Lower training costs were given as the reason why the VHT approach was the lowest-cost alternative and thus the most cost-effective. As we have seen, both current and recurrent costs of an ef-fective cadre of village health volunteers incurs a real cost to society and the government which should not be minimized.

Our observations in the field indicated a very wide range of capa-bilities and motivation of se-couristes and matrones. In some cases, one could determine the cost-effectiveness of the training given to a se-couriste by his attitude, his responses to our questions, the frequency of resupply on his own initiative, and the number of treatments regist-ered in his book. There was also a great disparity in the quantum of knowledge retained from training and retraining. An additional disparity was found in the length of training and retraining courses attended by the se-couristes and matrones.

The first basic problem, in our opinion, lies in selection of se-couristes through the sensitization of the community. The team's lim-ited experience indicates that, when a village appointed or asked a prominent member of its community to become a se-couriste, the outcome was better than when the community asked for a volunteer who often was

young and not as settled in the community as desirable. The second problem was the length of the training program, the quantity of material involved, and pedagogic methods used to deliver the desired body of knowledge to the volunteers.

The timing of training and retraining sessions should be such that they do not take place around the time of the first rains. Consideration should also be given either to making sessions longer or to giving 2 training sessions 6 to 8 months apart. The latter could be on an experimental basis for a group of secouristes and matrones in a progressive department such as Dosso to determine the amount learned and the amount retained after a few years. Yearly retraining sessions, even though costly, would probably be more cost-effective than the present system in the long run.

A third problem is supervision and associated problems of sufficient and more qualified manpower, transport, and fuel needed to maintain a schedule of frequent supervisory visits.

A fourth problem may very well be connected to low literacy rates among the volunteers. An increase in literacy rate, which would mean investments by the GON in rural literacy, would probably increase effectiveness of literate volunteers. It was the team's impression that literate secouristes were more knowledgeable about health in general.

The fifth problem is attrition through departure from the village. While this problem applies to both secouristes and matrones, there are a number of problems specific to the matrones, however. The team found that the knowledge of many of the matrones was little different from that of traditional midwives. The lack of knowledge retention and explanations in response to questions which indicated reversion to traditional medicine contributed a substantial amount of doubt in the mind of the team economist about the cost-effectiveness of investments in training matrones.

In addition, there is an unfortunate double-bind in the process of matrone selection. These women are usually selected from among traditional midwives, and they are often post-menopausal. Their experience and standing in the community are advantages, as is the trust that the village women have in them. One of the reasons put forward that women of post-menopausal age are preferred is that this reduces the likelihood of illicit relationships between husbands of pregnant women and young matrones. However, in selecting older women, most of whom are also illiterate, then presents the problem of dealing with a group of individuals who are set in their ways. They may be less inclined to believe and absorb new learning and, over time, seem inclined to forget what has been taught during training.

Thus, the length of the training period, the selection process for matrones, the sensitization of the community, improving training materials and pedagogic techniques, and increasing matrone supervision (by Sage Femmes rather than males from the CMs) would increase efficiency of the matrones. There is no doubt that the measures suggested would be costly; however, if carefully planned and executed, these additional

investments in past and present matrone training and supervision will make activities undertaken in the future more cost-effective than it is presently.

As indicated earlier, cost-effectiveness analysis requires preparation of a number of alternatives and analysis leading to a recommended alternative where each unit of investment return is to be maximized, either qualitatively or quantitatively, and preferably both. Although such an analysis is possible in determining the best alternative among various scenarios for introduction of improvements into VHT training and supervision, such an exercise could not be undertaken during this evaluation, primarily due to data limitations and time constraints.

As far as the third-country training component of the project is concerned, the team was not able to interview any individual who had received this type of training and returned to Niger. It would have been desirable to talk to them at length and look at specifics of their current positions, job description, and the relation between provided education and current job. Thus, no comments will be made on cost-effectiveness of third-country training.

Documents published as a result of national seminars were carefully reviewed by all team members and found to be quite impressive. The team found it strange that no mention was made within the documents of support by USAID-RHIP. It was obvious that most central MOH officials knew this, but one questions whether the others attending were aware of this fact. In any event, the success of the seminars, the wealth of information and analysis, and the increased levels of awareness they have brought the participants leaves the team with the impression that this endeavor has been a valuable cost-effective investment on the part of USAID.

#### 6.52 Nurse Training

As far as USAID funding of state and certified nurses is concerned, the analytic problem encountered was whether the number of students being trained at both institutions were additive or substitutive, that is, is USAID funding making it possible to train more than the number that the government had originally planned to train or are the funds being used to train a portion of those for which the GON already had the financial capability, either through its own resources or with other donor sources. In either case, team interviews with the administrators of ENICAS and ENSP have resulted in our being favorably impressed with progress which has been made in both these institutions. A long-term expatriate training specialist together with an educational audio-visual specialist seems necessary to improve training materials throughout the system, with emphasis on the training in ENICAS, ENSP, and in the curriculum for matrones and securistes.

### 6.53 Sanitation Training

At the present, it is not possible to comment on the cost-effectiveness of training investments undertaken in sanitation, either in country or in third countries. A discussion of their future is covered in another section of this report.

### 6.54 Medical Training

Nigerienne medical students were to be funded to expand their rural experience during a residency established by the MOH. As far as the evaluation team could determine, none of these funds were committed as of the time this evaluation was undertaken. During the field trip, the evaluation team had the opportunity to meet with 7 medical students who will graduate at the end of 1981. The almost total lack of planning in project implementation was observed in the training of medical students as well. No plans have been made to establish rural residencies for these final-year medical students, nor are there plans, as far as we could ascertain, to orient Nigerienne doctors in the field who have been educated abroad and are returning to assume responsibilities with the government.

A corollary problem the team observed was the preponderance of Nigerienne medical doctors in administrative positions. It was estimated that, as of 1981, there were some 40 Nigerienne physicians working in the country; the team found that about half are involved in either full- or part-time administrative work. This is an unfortunate waste of a scarce and expensive resource. Many administrative positions could be held by state or certified nurses with a degree in public administration at far less cost. Physicians are in short supply.

### 6.55 Technical Assistance

The technical assistance supported by this project has, with important exceptions, consisted of professionals directly related to commodities supplied, such as auto mechanics, laboratory technicians, etc. An epidemiologist at earlier stages, sanitary engineers at the middle of project life, and a lab equipment repair specialist complete the expatriate manpower envisioned as sufficient for this project. As far as could be determined, despite the fact that there were many problems associated with the recruitment and mobilization, specialists are now working on site in Niger. The lab equipment technician is a young man without any French skills, thus, one of his functions must be postponed for at least 6 months until he learns French, Djerma, or Hausa. Therefore, part of the investment in his services will be wasted since he is not presently able to transfer his skills to his counterpart.

As far as cost-effectiveness of the investment in the the 2 sanitary engineers is concerned, detailed recommendations on increasing their effectiveness are given in the chapter dealing with conclusions and recommendations, elsewhere in this report. It is the evaluation team's obser-

vation that technical assistance previewed for the project is not sufficient for proper functioning of the project nor for achieving its objectives. Recommendations on the type, length, and cost of additional technical assistance resources by this team are discussed in detail in other sections of this report.

#### 6.56 Logistic Support

Even though both the vehicles and Mobylettes that were ordered have arrived, a number of problems raise questions on whether the investment decision was made with cost-effectiveness in mind.

The vehicles ordered arrived without the 25% spare parts package also ordered. In the near future, breakdowns will keep vehicles out of circulation for an extended period of time. The second problem in terms of cost-effectiveness was the U.S. requirement of ordering U.S. -made vehicles which have not and do not stand up well to the rough terrain and sandy conditions encountered in Niger. This problem has been further exacerbated by the discontinuance of production of the International Harvester Scouts, causing questions to be raised by GON/MOH about the wisdom of USAID providing them since GON officials had suggested solicitation of waivers for purchasing Land Rovers in the original discussions.

#### 6.57 Equipment and Supplies

In addition to the substantial delays in arrival of equipment and supplies, there has been a loss of resources due to inattention to basic planning and operational procedures. Equipment, after many delays in ordering and arriving, is at times kept in customs for much longer periods than is necessary. Instead of immediately taking an inventory of arrivals and proceeding with previously-planned and established distribution of equipment, crates are kept either in the open or closed warehouses until a decision is made by someone to do something with that specific shipment.

Detailed discussions on equipment and supplies and on the cold chain are presented in other sections of this report. It will suffice to mention one example observed during the evaluation which points toward the politico-administrative influence on decision-making, affecting the equipment and supplies distribution which has cost effective implications. A large number of jetguns and spare parts for vaccinations were ordered and received by the MOH under RHIP funding; most of these were distributed to Niamey Department. However, in visits all over the country, the team saw a dire need for new Ped-0-Jets and spare parts. This situation is applicable to all shipments and not just to Ped-0-Jets and spare parts. The problem has been exacerbated because of absence of a procurement specialist's involvement at project design stage to determine the appropriate mix of needed equipment and supplies.

## 6.58 Construction and Renovation

The evaluation team visited the DDS headquarters sites and a number of the dispensaries funded by RHIP and found design deficiencies as well as utilization of sub-standard materials; these aspects are discussed in more detail in other sections of this report. Here, it must only be mentioned that a certain amount of resource loss has already been experienced, the extent of which could not be determined during the evaluation.

## 6.59 Financial Aspects

A brief summary of the financial aspects of the project are presented below to round out this chapter on economic aspects of the RHIP to date. Two summary tables are presented in this section. Table 18 was provided by the Comptroller's Office, USAID/Niamey, and is descriptive of the financial situation of the project as of December 31, 1980. Table 19 was provided by GON/MOH Project Management in the second week of March, 1981. Both tables will be briefly analyzed to complete the analysis section of the report.

Information provided by the Comptroller's Office to the team indicates that, as of January 31, 1981, the outstanding cash advances for local expenses of RHIP stood at CFA 186,730,159; at an exchange rate of CFA 240 to US\$1.00, this advance is equivalent to \$778,042.33. Early in February, 1981, an additional advance of CFA 18 million was approved, bringing the total to CFA 240,730,159 or \$853,042,33. The Comptroller expressed his concern about receipt of adequate accounting for these disbursements, and, at the time of this evaluation, it was the team's impression that suitable and satisfactory measures were in the process of being adopted. A copy of the memorandum expressing the Comptroller's concern is in the Appendices.

Drawdowns on this project as of early 1981 consisted of \$853,000 in local currency advances and about \$810,000 in U.S. currency advances and about \$810,000 in U.S. currency disbursements, bringing the total to just under CFA 42,000,000 in two and one-half years of project life. In reality, however, since there was practically no financial activity during calendar year 1978, the actual starting date of the project was 1979, when activities and expenditures began.

Table 19, the original of which was provided to the team during the second week of the evaluation, provides a comparison between budgeted funds and expenditures to date in both currencies and it was noted that, as of February, 1981, 49% of funds destined to third-country training had been disbursed. For continuing education and seminars, expenditures were 59% of budgeted amounts. There were no disbursements made to date for rural residencies for medical students, and it is suggested the funds be reprogrammed. Only 34% of the funding budgeted for training of individual at ENICAS had been disbursed, while for training at ENSP, 25%

RURAL HEALTH IMPROVEMENT  
PROPOSED FINANCIAL PLAN

TABLE 18

	<u>YEAR 1</u>	<u>YEAR 2</u>	<u>YEAR 3</u>	<u>TOTAL</u>	<u>CHANGE</u>	<u>EXISTING BUDGET</u>	<u>PROPOSED BUDGET</u>
<u>PERSONNEL</u>	661	669	632	1,962	+751	1,211	1,962
U.S. Technicians - long term	655	655	550	1,860	+801	1,059	1,860
U.S. Technicians - short term	6	-0-	69	75	-50	125	75
Local Office Personnel	-0-	14	13	27	-0-	27	27
<u>TRAINING</u>	50	670	989	1,709	-80	1,816	1,709
U.S Participants - long term	35	55	30	120	+55	65	120
Third Country Participants	15	50	60	125	-0-	125	125
Medical School Program	-0-	-0-	-0-	-0-	-165	165	-0-
ENICAS	-0-	130	133	263	-0-	263	263
ENSP	-0-	50	60	110	-0-	110	110
Village Health Teams	-0-	380	616	996	+60	936	996
Workshops, Seminars & Conferences	-0-	5	90	95	-57	152	95
<u>CONSTRUCTION</u>	906	558	300	1,764	+266	1,498	1,764
Dispensary	507	100	300	907	+300	607	907
DDS	399	458	-0-	857	-34	891	857
<u>COMMODITIES</u>	298	519	328	1,145	-680	1,825	1,145
Vehicules	163	92	176	431	-150	581	431
Mobylettes	50	77	30	157	-0-	157	157
Garage Tools & Equipment	40	25	25	90	+55	35	95
Medical Repair Equipment	35	-0-	25	60	-5	65	55
Dispensary & CM Equipment	-0-	150	50	200	-50	250	200
Cold Chain Equipment	-0-	150	-0-	150	-542	692	150
Other	10	25	22	57	+12	45	57
<u>OTHER COSTS</u>	85	184	324	593	-230	823	593
Environmental San. Improvement	40	73	100	213	-310	523	213
Local Office Operations	35	11	32	78	-0-	78	78
Vehicule Operating Costs	-0-	-0-	40	40	-0-	40	40
Nutrition Education Programme	-0-	-0-	70	70	-30	100	70
Health Education Programme	-0-	-0-	32	32	-50	82	32
Special Studies/Evaluation	10	100	50	160	+160	-0-	160
<u>TOTAL</u>	2,000	2,600	2,573	7,173			7,173

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RURAL HEALTH IMPROVEMENT

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Project Budget	Description	PIO Type	PIO Number	Date Issued	Amount Sub-Oblig'd	Amount Unearmarked	Unliquidated Balance	Amount Disbursed	Amount Accrued	Total Accrued Exp.
425,000	Personnel				-0-	-0-	-0-	-0-	-0-	-0-
	Africare	T	80643	8/78	418,898	-0-	317,732	101,166	60,000	161,166
	Hamphill	PIL		10/78	6,102	-0-	-0-	6,102	-0-	6,102
	Sub-Total				425,000	-0-	317,732	107,268	60,000	167,268
157,000	Training				-0-	7,071	7,071	-0-	-0-	-0-
	Kane	P	80655	3/79	27,929	-0-	3,791	24,138	-0-	24,138
	3rd Country Training				-0-	590	590	-0-	-0-	-0-
	Mariama	P	80687	7/80	5,250	-0-	5,250	-0-	4,000	4,000
	Moussa Kodu	P	80680	9/80	9,160	-0-	9,160	-0-	5,000	5,000
	Training - Tools	C	80641	8/78	50,000	-0-	11,155	38,845	-0-	38,845
	Training Workshops	PIL No. 4			57,000	-0-	57,000	-0-	-0-	-0-
	Sub-Total				149,339	7,661	94,017	62,983	9,000	71,983
1,025,000	Construction				-0-	-0-	-0-	-0-	-0-	-0-
	Dept. Headquarters				607,000	-0-	607,000	-0-	-0-	-0-
	Dispensaries				418,000	-0-	418,000	-0-	-0-	-0-
	Sub-Total				1,025,000	-0-	1,025,000	-0-	-0-	-0-
308,000	Commodities				-0-	786	786	-0-	-0-	-0-
	Scouts	P	80642A	8/78	162,214	-0-	34,023	128,191	-0-	128,191
	Mobylettes	PIL No. 4			50,000	-0-	50,000	-0-	-0-	-0-
	Garage Tools	PIL No. 4			2,126	-0-	2,126	-0-	-0-	-0-
	Garage Tools	P	80641	8/78	7,874	-0-	4,606	3,268	-0-	3,268
	Medical Repair Equip.	PIL No. 4			21,967	-0-	21,967	-0-	-0-	-0-
	Other Commodities	PIL No. 4			8,525	-0-	8,525	-0-	-0-	-0-
	Other	P	80641	8/78	11,475	-0-	1,800	9,675	-0-	-0-
	Sub-Total				307,214	786	142,727	165,273	-0-	165,273

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PROJECT 683-0208  
RURAL HEALTH IMPROVEMENT

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Project Budget	Description	PIO Type	PIO Number	Date Issued	Amount Sub-Oblig'd	Amount Unearmarked	Unliquidated Balance	Amount Disbursed	Amount Accrued	Total Accrued Exp.
85,000	Other Cost				-0-	-0-	-0-	-0-	-0-	-0-
	Envir. San. Improves	PIL No. 4			50,000	-0-	50,000	-0-	-0-	-0-
	Local Office Operations	PIL No. 4			35,000	-0-	35,000	-0-	12,000	12,000
	Sub-Total				85,000	-0-	85,000	-0-	12,000	12,000
2,000,000	GA Total				1,991,553	8,447	1,664,476	335,524	81,000	416,524
Funding: Appropriation 1012										
654,000	Personnel				-0-	-0-	-0-	-0-	-0-	-0-
	U.S. Tech. Long-term				-0-	640,000	640,000	-0-	-0-	-0-
	Local Office Personnel				-0-	14,000	14,000	-0-	-0-	-0-
	Sub-Total				-0-	654,000	654,000	-0-	-0-	-0-
670,000	Training				-0-	-0-	-0-	-0-	-0-	-0-
	3rd Country Participants				-0-	4,350	4,350	-0-	-0-	-0-
	Mathieu and Sanda	P	80688	8/80	12,000	-0-	12,000	-0-	-0-	-0-
	Boureims and Souanna	P	80690	8/80	18,000	-0-	18,000	-0-	-0-	-0-
	Zaire Training	P	00012	10/80	5,893	-0-	5,893	-0-	-0-	-0-
	Dakah and Mariama	P	90654	10/80	9,000	-0-	9,000	-0-	-0-	-0-
	Misc. Part. Travel			8/80	757	-0-	-0-	757	-0-	757
	Medical School Program				-0-	41,499	41,499	-0-	-0-	-0-
	MS Program Equipment	C	80641	8/78	13,501	-0-	13,501	-0-	-0-	-0-
	Nurse Training (ENICAS)	P	00009	9/79	130,000	-0-	130,000	-0-	-0-	-0-
	Nurse Training (ENSP)	P	00001	9/79	50,000	-0-	50,000	-0-	-0-	-0-
	Village Health Teams	PIL		9/80	380,000	-0-	224,390	155,610	-0-	155,610
	Workshops & Seminars	PIL		9/80	-0-	5,000	5,000	-0-	-0-	-0-
	Sub-Total				619,151	50,849	513,633	156,367	-0-	156,367

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PROJECT 683-0208  
RURAL HEALTH IMPROVEMENT

Project Budget	Description	PIO Type	PIO Number	Date Issued	Amount Sub-Oblig'd	Amount Unearmarked	Unliquidated Balance	Amount Disbursed	Amount Accrued	Total Accrued Exp.
473,000	Construction Dispensaries	PIL		9/80	-0-	-0-	-0-	-0-	-0-	-0-
					-0-	473,000	473,000	-0-	-0-	-0-
619,000	Commodities				-0-	-0-	-0-	-0-	-0-	-0-
	Scouts	C	90637	12/79	92,000	-0-	92,000	-0-	75,000	75,000
	Mobylettes	PIL		9/80	-0-	28,651	28,651	-0-	-0-	-0-
	Mobylettes	P.O.		11/80	48,349	-0-	48,349	-0-	-0-	-0-
	Garage Tools	PIL		9/80	-0-	516	516	-0-	-0-	-0-
	Garage Tools	C	90645	11/80	24,484	-0-	24,484	-0-	-0-	-0-
	Dispensary	C	90636	2/80	150,000	-0-	6,316	143,684	-0-	143,684
	Cold Chain Equip.	PIL		9/80	-0-	204,500	204,500	-0-	-0-	-0-
	Cold Chain Equip.	C	80661	3/79	45,500	-0-	963	44,537	-0-	44,537
	Other	PIL		9/80	-0-	24,000	25,000	-0-	-0-	-0-
	Sub-Total				360,333	258,667	430,779	188,221	75,000	263,221
184,000	Other Costs				-0-	-0-	-0-	-0-	-0-	-0-
	Environ. Sanitation	PIL		9/80	-0-	132,986	132,986	-0-	-0-	-0-
	Filter from Onersol	PIL		9/80	40,014	-0-	17,507	22,507	-0-	22,507
	Local Office Expenses	PIL		9/80	11,000	-0-	(20)	11,020	-0-	11,020
	Sub-Total				51,014	132,986	150,473	33,527	-0-	33,527
2,600,000	Amendment Total				1,030,498	1,569,502	2,221,885	378,115	75,000	453,115
<u>Amendment No. 4</u>										
132,000	Personnel				-0-	-0-	-0-	-0-	-0-	-0-
	U.S. Tech. Short-Term	PIL		9/80	-0-	119,000	119,000	-0-	-0-	-0-
	Local Office Personnel	PIL		9/80	-0-	13,000	13,000	-0-	-0-	-0-
	Sub-Total				-0-	132,000	132,000	-0-	-0-	-0-
989,000	Training				-0-	-0-	-0-	-0-	-0-	-0-
	U.S. Part. Long-term	PIL		9/80	-0-	3,951	3,951	-0-	-0-	-0-

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RURAL HEALTH IMPROVEMENT

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December 31, 1980

Project Budget	Description	PIO Type	PIO Number	Date Issued	Amount Sub-Oblig'd	Amount Unearmarked	Unliquidated Balance	Amount Disbursed	Amount Accrued	Total Accrued Exp.
	Barti Oumarou	P	80651	1/79	26,049	-0-	4,854	21,195	-0-	21,195
	3rd Country Part.	PIL		9/80	-0-	-0-	-0-	-0-	-0-	-0-
	Abidjan, Ivory Coast	P	00011	8/80	27,000	-0-	-0-	33,000	-0-	33,000
	Boukar, Zaire	P	00012	8/80	33,000	-0-	-0-	33,000	-0-	33,000
	Medical School Prog.	PIL		9/80	-0-	60,000	60,000	-0-	-0-	-0-
	Nurses Training	PIL		9/80	-0-	-0-	-0-	-0-	-0-	-0-
	ENICAS Ecol Nat. Zinder	P	00009	8/80	133,000	-0-	133,000	-0-	-0-	-0-
	ENSP Ecol Nat. Niamey	P	00010	8/80	60,000	-0-	60,000	-0-	-0-	-0-
	Village Health Teams	PIL		9/80	-0-	556,000	556,000	-0-	-0-	-0-
	Workshop & Seminars	PIL		9/80	-0-	69,398	69,398	-0-	-0-	-0-
	Medix, Hawaii	P	00019	9/80	10,820	-0-	10,820	-0-	-0-	-0-
	Local Conference	PIL		9/80	9,782	-0-	-0-	9,782	-0-	9,782
	Sub-Total				299,651	689,349	914,624	74,376	-0-	74,376
898,000	Commodities				-0-	-0-	-0-	-0-	-0-	-0-
	Vehicles	PIL		9/80	-0-	326,000	326,000	-0-	-0-	-0-
	Mobylettes	PIL		9/80	-0-	30,000	30,000	-0-	-0-	-0-
	Dispensary Equip.	PIL		9/80	-0-	89,100	89,100	-0-	-0-	-0-
	Midwifery	C	80685	5/80	10,900	-0-	240	10,660	-0-	10,660
	Cold Chain Equip.	PIL		9/80	-0-	442,000	442,000	-0-	-0-	-0-
	Sub-Total				10,900	887,100	87,340	10,660	-0-	10,669
554,000	Other Costs				-0-	-0-	-0-	-0-	-0-	-0-
	Environ. San. Imp.	PIL		9/80	300,000	-0-	294,592	5,408	-0-	5,408
	Local Office Operations	PIL		9/80	32,000	-0-	31,394	606	-0-	606
	Vehicle Operations	PIL		9/80	40,000	-0-	34,756	5,244	-0-	5,244
	National Ed. Div.	PIL		9/80	100,000	-0-	100,000	-0-	-0-	-0-
	Health Ed. Prog.	PIL		9/80	82,000	-0-	82,000	-0-	-0-	-0-
	Sub-Total				554,000	-0-	542,742	11,258	-0-	11,258
2,573,000	Amendment Total				864,551	1,708,449	2,476,706	96,294	-0-	96,294
7,173,000	Project Total				3,886,602	3,286,398	6,363,067	809,933	156,00	975,933

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of the planned amount has been used. Since no funds have been disbursed for sanitarians, all funding is still available for disbursement.

Disbursements for training and retraining of VHTs have been 19% of budgeted amounts while only 7% of the educational materials budget has been expended. Equipment for the automotive shops had disbursements of 21% while those of dispensary and CM equipment, equipment for local administrative offices, technical assistance personnel, 4-wheel drive vehicles, and Mobyettes had disbursements of 39%, 50%, 3%, 12%, and 14%, respectively. (Percentage figures from the tables have been rounded off in the text for simplicity of presentation.)

The last 6 categories of expenditures are DDS headquarters construction; improvement of hygiene, sanitation and environment; sanitation education short-term consultants; vaccine purchases; and the purchase of drugs for VHTs. According to information given the team by the project management, no disbursements have yet been made for any of the above 6 categories with the exception of those for improvement of hygiene, sanitation, and the environment; only slightly over 4% of budgeted funds have been distributed to date.

Budget items where no expenditures have yet been made are: cold chain equipment, automotive shops, operational management, and construction of rural dispensaries.

It is important to note recording delays between the set of data at the project office and the Comptroller's Office at USAID. Despite the advances made to the GON for specific purposes, these do not show up as partial category expenditures until project management has recorded actual progress.

### Conclusions on Financial Aspects

Project funds have not been drawn down according to schedule, and, even though the project is at mid-point, from the point of view of disbursement and activities, the majority of outputs are expected to be in the future. One way to insure proper functioning of the project, both from the point of view of achievements and outputs, is to use the full-time effort of a group of Nigeriennes, supported by a professional group of expatriates, for proper monitoring of transactions, gathering and recording of all types of project-related information, and especially in monitoring financial aspects.

### 6.6 Economic and Financial Implications of Conclusions and Recommendations Reached by the Evaluation Team

The evaluation team's recommendations may be divided into 5 categories in terms of economic and financial implications. These are:

- 1) Long-Term technical assistance
- 2) Short-term technical assistance
- 3) Vehicles

- 4) Equipment
- 5) Training

#### 6.61 Long-Term Technical Assistance

Long-term assistance has 2 basic components; the first is the technical assistance provided at present by Africare. From January, 1981, until December, 1982, (end of project life), Africare is providing 8 specialists (16 person-years) at \$150,000/ year, for a total cost of \$2.4 million. Considering the recommendation that the project life be extended until December, 1984, Africare will be providing 7 specialists (14 persons-years) at \$150,000/year for a total of \$2.1 million.

The team is aware that Africare's present person-year cost is much lower than \$150,000; however, it is assumed that these costs must rise in order to provide the kind of backstopping and logistical support that their specialists will need. The total cost of technical assistance to be provided by Africare is assumed to be part of the budgeted funds of the project and is also assumed to come from obligated funds. Thus, the technical assistance provided by Africare to December, 1982, at a cost of \$2.4 million is budgeted from funds already obligated. The technical assistance for the extended period (January, 1983, to December, 1984) - \$2.1 million - are new funds which will need to be requested over and above the original \$14 million.

The second component of the long-term technical assistance is estimated at a cost of \$1.35 million for 6 specialists (9 person-years) for which new funding will also be needed. This technical assistance is to start on January, 1982, and will last various periods as indicated in the attached tables.

#### 6.62 Short-Term Technical Assistance

A total of 17 person-months of short-term technical assistance is recommended at an estimated cost of \$255,000 for 8 specialists. This manpower allocation is to come from the 30 person-months already budgeted in funds obligated to date.

#### 6.63 Vehicles

Two additional 4-wheel drive vehicles are recommended for purchase in addition to those already purchased, and should be bought from already-budgeted funds. In addition, the team recommends the purchase of 10 3-wheel all-terrain vehicles from the existing vehicle budget. A total of 100 Mobylettes purchased in 2 stages, are recommended at a total estimated cost of \$166,500. This is in addition to the original budget and, therefore, requires new funding.

#### 6.64 Equipment

\$8000 worth of water-testing kits are recommended for purchase and will need new funding. \$21,000 for well equipment/electric generators purchase is recommended, and this will be allocated from funds already budgeted in the project. The team recommends the purchase of a mini-computer at an estimated cost of \$15,000, which will need new funding. The team recommends that consideration be given to Burroughs equipment since they are represented in Niger and, can provide proper maintenance and repair as well as for availability of spare parts. The team, as well, recommends the purchase of 200 improved, sterile instrument trays for dispensaries at a cost of \$5,000, which will require new funding.

#### 6.65 Training

The evaluation team has made two major recommendations for training of Nigeriennes who will be working as counterparts to expatriate specialists which were mentioned above. The team recommends 6 Nigeriennes to receive third-country training of up to 6 months each in health data specialization.

The team also recommends one Nigerienne who will be trained as a Training Specialist and could be either a certified or state nurse with teaching experience at ENICAS or ENSP to have third-country training experience of up to 6 months or longer in training in curriculum development and training materials development. All training of Nigeriennes should be from existing budgeted funds.

Table 20

ESTIMATED COSTS OF ACTIONS RECOMMENDED IN THE U.S. TEAM REPORT

(Includes Inflation Factor)

<u>Long-Term Consultants</u>	<u>Per Year/Ea.</u>	<u>Total</u>
1 Cold Chain/Communicable Diseases Specialist for 2 yrs.-Jan. '82-Dec.'83 [State RN with relevant experience]	\$150,000	\$300,000
3 Health Data Specialists, 1 for ea. 2 Depts. for 1 yr.-July '82-July '83 [6 Nigeriennes, 2/expatriate, to receive 6 mos. 3rd-country trng. before ex- patr. arr., no later than beg. Jan. '82]	150,000	450,000
1 Curriculum and Trng. Materials Development Spec. seconded to ENSP, for 2 yrs.-Jan. '82-Dec. '83 [State/certified RN w/3rd-county trng. exper. and teaching exper. at ENICAS/ENSP]	150,000	450,000
1 Health Training Materials Specialist for 2 years-Jan. '82-Dec. '83 [Health Trng. Mats. Spec. Trainee-state/cer- tified RN w/reg. position at ENSP/ENICAS]	150,000	450,000
		<u>\$1,350,000</u>
 <u>Extension of Present Long-Term Staff</u>		
2 Sanitary Engineers (Africare) Dec.'82-Dec.'84	150,000	600,000
2 Biomedical Technicians (Africare) Dec.'82-Dec.'84	150,000	600,000
3 Auto Mechanics (Africare) Dec.'82-Dec.'84	150,000	900,000
		<u>\$2,100,000</u>

Table 20 (Cont'd.)

<u>Short-Term Consultants</u>	<u>Cost/Mo.</u>	<u>Total</u>
1 Ped-0-Jet Specialist - 1 mo. (Jan.'82)	\$15,000	\$15,000*
1 Sanitary Engineer - 2 mos. (Jan.'82) to analyze feasibility dissem. of lift-support syst. as approp. tech. throughout Niger [2 engineers from NSHS]	15,000	30,000*
1 Manual Pump Expert-3 mos. (2/Jan.'82-1/Jan'83)	15,000	45,000*
1 Sanitary Engineer - 3 mos. (Jan.'83)	15,000	45,000*
1 Org. Management Spec. - 2 mos. (Jan.'83)	15,000	30,000*
1 Financial Analyst - 2 mos. (Jan.'83) [1 Nigerienne/expatriate with commen- surate specialty and experience]	15,000	30,000*
1 Epidemiologist - 2 mos. (jan.'83)	15,000	30,000*
1 Sociologist/anthropologist - 2 most. (jan.'83) for schistosomiasis and other studies to improve environmental sanitation [1 Nigerienne/expatriate specialist with com- mensurate experience and speciality]	15,000	30,000*
		<u>\$255,000*</u>
 <u>Vehicles</u>	 <u>Cost/each</u>	
10 lightwgt. 3-wheel all-terrain vehicles	\$2,000	\$20,000*
2 4-wheel drive vehicles (Amer. equipment, if possible)	24,000	48,000*
100 Mobylettes	1,665	166,500
		<u>\$166,500</u>
		\$68,000*

Table 20 (Cont'd.)

<u>Equipment</u>	<u>Cost/Unit</u>	<u>Total</u>
40 HACH water testing kits	\$ 200	\$ 8,000
7 well equipment/electric generators	3,000	21,000*
1 Mini-Compuer (preferably Burroughs)		15,000
200 improved sterile instrument trays for dispensaries	25	5,000
		<hr/>
		\$28,000
		21,000*

Training

- 6 Nigeriennes to receive 6 mos. of 3rd-country training experience in Health Data Specialization
- 1 Nigerienne, trng. spec./certif./state RN, teaching at ENICAS or ENSP to have 3rd-country trng. experience in Training Curriculum Development.

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Unstarred funds indicate activity will need additional new funding (including training in above category).

Starred funds \* indicate activity can be funded for existing project budget.

[ ] indicate recommended qualifications for GON counterpart for expatriate specialist.

APPENDIX B

PROJECT IMPLEMENTATION LETTERS ISSUED (RHIP #683-0208)

<u>No.</u>	<u>Date</u>	<u>Subject</u>
1	7 June 1978	Designates Dr. Goerge Jones as counterpart to the Project director. Dr. Jones was previously involved with development of Project Paper. Represented Mission during AID/W review of Project Paper (Sherwin).
2	28 July 1978	Two of four conditions precedent met: 1) Statement of person spec. in Section 8.2 and specimen signatures. 2) Description of procedure for semi-annual meetings to evaluate and assess the accomplishment of objectives under Sec. 4.  Account number required ot meet third condition Request a joint <u>6-month report</u> directly to Mission Director (Johnson - draft Gutnan).
3	14 August 1978	Specifies all conditions precedent have been met in Project Grant Agreement dated July 1, 1978. Up to 42,000,000 committed for project. Advance of \$254,000 indicated. Project Director required to submit a reimbursement voucher with accompanying receipts, etc. To be certified by Project Advisor.
4	30 July 1980	Agrees that 1.9 million FCFA of project funds may be used for repairs to old ENICAS garage in Zinder. To be charged to construction renovation line. Points out that 1.498 million has been available for 2 years for construction of 7 dispensaries and 2 departmental headquarters. Approval of funds for construction of third DDS in Maradi (70 million FCFA). Requests info. on construction component.
5	13 Feb. 1981	Provides for incorporating personnel from Africare Project 683-0214 (Diffa - Basic Health Services project) into the RHIP (683-0208). Sufficient funds for their services until 31 December 1982. Personnel line increased to \$1.962 million. Points out necessity to complete negotiations with Africare and complete and execute contract amendment.

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APPENDIX C

PERSONS CONTACTED AND VILLAGES VISITED

19 Villages

Maradi

Kadri Tankari, DDS  
Ibrahim Abdou, Responsible ESV  
Adamou Souley, Director CHD  
Oumarou Mattan, Responsible for Pharmacy  
Mamane, Infirmier responsible for EDHMM  
Chief, CM Aguié and elevegard - assistants  
Infirmier at the dispensary at Tchadoua  
Chief, CM, and Sage-Femme CM Tessaoua

Zinder

Boko Daouda, DDS  
Altine Mahamane, Adjoint  
Anche Lobit, Adjoint  
El Hadj Brah Dan Yaya, Chief, CM, Mirrah  
Alassane Abdou, Chief, CM, Tanout  
Infirmier at Takeita dispensary  
Laouali Iadjio, Director of Hospital  
Hassan Sonamaila, Director, ENICAS  
Ayouba Hjiibo, Monitor ENICAS  
Dr. Djoulde, Chief of Medicien at EDHMM  
Ali Barkize, Radiologist, Zinder Hospital

Agadez

Alizou Mahamane, DDS  
Seyni Soumana, Adjoint  
El Hadj Mahamane Moustapha, Chief, CM Agadeq  
Adamou Saley, Director, CHd, Agadez  
Infirmier responsible for EDHMM  
Infirmier responsible for PMI, Ingall  
Infirmier responsible for dispensary at Aderbissanat

Tahoua

Magagi Daga, DDS  
Moussa Idi, Adjoint  
Ali Cisse, Adjoint  
Cheif, CM at Illila  
Infirmier at dispensary at Tadjae

Dosso

Yansambo Boubacar, DDS  
Soubdou Dan Rabo, Adjoint  
Infirmier at dispensary at Farrey

Niamey

Dr. Gobert Gerard, DDS  
Kadri Kkoda, Adjoint  
Saley Hassan Chief, CM, Tera

APPENDIX D

Republic of Niger  
Department of Maradi  
Medical Center in Tessaoua

TRAINING PROGRAM FOR MIDWIVES 1981

- Day 1 Morning: Official opening ceremony by the Sous-Prefet; Presentation of trainers. Visit dispensary facilities. Discussion concerning training program and traditional role of midwives.
- Afternoon: Cleanliness of the body. Elementary rules of health. Care of clothing. Practical work - washing of the hands, visual aids.
- Evening: Session concerning cleanliness.
- Day 2 Morning: Purifying Water, the importance of using clean water. Practical work - filter water, use of cambric cotton, boiling water, discussion of options for obtaining clean water.
- Afternoon: Menstration and pregnancy. Basic explanation of the reproductive cycle and normal preganancy.
- Day 3 Morning: Warning signals which may occur during a pregnancy. Practical work - visual aids (flannel-graphs). Pictorial records.
- Afternoon: Labor, preparing for labor, stages of labor.
- Evening: Presentation concerning births.
- Day 4 Morning: Delivery of the baby, examination of the palcenta. Practical work - procedure of delivering a baby at the maternity.
- Afternoon: Cases necessitating evacuation; breech deliveries, multiple births, retention of placenta, etc.
- Evening: Cases of difficult labors discussed.
- Day 5 Morning: Treatment of the infant, artificial respiration, care of the umbilical lesion. Bathing the infant and treatment for the eyes.
- Afternoon: Continued care of the mother, and the baby. Care needed in cases of pre-matruie infants. Breast feeding.
- Evening: Discussion of birthing.
- Day 6 Morning: Nutritional needs during pregnancy. Discussion of the infant. Practical work - classification of essential foods.

Afternoon: Explanation of proteins, fats, carbohydrates and vitamins.

Evenings: Local foods and their nutritional values.

Day 7 Morning: Introducing foods to the baby. practical work - demonstrate the progressive baby foods recommended by the PMI.

Afternoon: Explanation of germs, transmission of diseases, causes and spread of infection.

Evening: Discussion of malaria and its control.

Day 8 Morning: The role of the midwife in the community. Materials supplied to the midwives and their uses.

Afternoon: Assist at the maternity in preparing a mother for birth.

Day 9 Morning: Review of subjects covered in training program-opportunities for questions. Keeping the notebook recording births and birth certificates.

Afternoon: The relationship of the midwife and other members of the Village Health Team with the community at large.

Day 10 Morning and Afternoon: Review.

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APPENDIX E

PROGRAM FOR TRAINING OF VILLAGE HEALTH TEAMS 1981

- Day 1 Official opening by the Sous-Prefet, presentation of training staff. Visit dispensary. Presentation of the program for training and discussion concerning the role of the first-aider.
- Afternoon: Sanitation; personal and environmental
- Evening: Discussion of hygiene.
- Day 2 Morning: continued discussion of sanitation including water. Discussion concerning epidemic diseases; meningitis, cholera, measles, etc. Symptoms and treatments discussed.
- Afternoon: Vaccinations, schistosomiasis, guinea worm, causes and prevention.
- Evening: Review of material.
- Day 3 Morning: Tuberculosis, fractures, hemorrhage, and burns, treatments.
- Afternoon: Practical work - bandaging, immobilizing limbs.
- Evening: Review of material.
- Day 4 Morning: Malnutrition, causes and treatment. Services offered by the Maternal and Child care services. Presentation of the three food groups.
- Afternoon: Presentation of weaning foods recommended by the PMI. Practical demonstrations of these foods.
- Day 5 Morning: Open sore, conjunctivitis, fevers, causes and treatments.
- Afternoon: Practical work - observation and treatment at dispensary.
- Evening: Review of material.
- Day 6 Morning: Diarrhea, vomiting causes, preventions and treatment.
- Afternoon: Demonstration at dispensary of rehydration solutions, and anti-diarrheal infusions.
- Evening: Further discussion of diarrhea.
- Day 7 Morning: Malaria; treatment, causes and prevention.
- Afternoon: Role of village first-aider in community.

- Evening: discussion of anti-malarial campaign.
- Day 8 Morning: Record keeping methods.  
Afternoon: Continuation of mornings subject.
- Day 9 Morning: Presentation of medications.  
Afternoon: Presentations of medical kits.  
Evening: Revision.
- Day 10 Morning: Practice in completing record books.  
Afternoon: Recording major maladies, malaria, diarrhea and meningitis.
- Day 11 Closing Ceremony and return to home villages of trainees with the trainers.  
Afternoon: General review.

## APPENDIX F

### Training Program - LPN (Certified Nurses)

#### Located in Zinder

Entrance Level - End of 5e (8th grade equivalent), must have CEPE Diploma; admission is competitive.

Length of Training - One year. Could be carried over two year period. After the diploma, student may specialize:

- Aides Assistants de l'Action Sociale
- Animatrice rurales

#### Assignments at the End of School:

The LPN is assigned to work in:

- hospitals (Niamey, Zinder, Tahoua)
- different departmental hospitals
- center for widespread epidemics
- PMI service
- rural dispensaries where they will be administrators

#### Promotion

After four years experience in the field of health, the Certified Nurse can study for State diploma after having taken a competitive exam. If successful in the exam, the candidate can be admitted for study at the National School for Public Health in Niamey.

#### Job Description

At the end of his studies, the certified nurse should be capable of:

1. Giving medical treatment prescribed by the doctor or head nurse; recognizing needs and care of the patients.
2. Prescribing up-to-date, simple treatment in the absence of the doctors or head nurse (in rural dispensary).
3. Taking the initiative to direct a case he cannot handle.
4. Running the dispensary, organizing consultations, seeing to up-keep of work areas and materials at his disposition.
5. Participation in all health education campaigns of the population.
6. Supervising the village securistes' and hygienists' traditional mid-wives work and participating in their training.

On the whole, the certified nurse works under the responsibility of an RN, but he can be called to work alone in a rural dispensary.

### Training

1. To understand and do the task correctly: professional - in the curative, educative and prophylactic areas; administrative.
2. To act with care in therapeutic matters and to seek assistance from more competent people in the profession.
3. To work in and integrate himself into a work team.
4. To analyze a situation, make a judgment and to act logically and with good sense.
5. To face an emerge by situation and to know when to evacuate a patient.
6. To analyze a situation and adapt himself to people in such a way as to pursue an effective health education.
7. To give an example of good hygiene and to influence the behavior of the population in this area.

Teaching Methodology - the apprenticeship of a certified nurse is based on:

A theoretical training: In the form of classes - work groups

A technical training: In the demonstration room, patients' rooms in the hospital centers and in the extra hospital centers. The students will learn to develop the observant mind, to recognize the patients' basic needs and adapt the care to them. To distinguish the line between theory classes and in the field practice, to work on a team and acquire concern for well-done work. In order to attain these goals, the students will work under a training monitor's or duty nurse's supervision. they will make controlled observations of the patients and mark down their newly acquired information in a training notebook which is check by the monitor. Numerous audio-video aids are at the disposite of the teachers:

- boards, anatomical models
- films, slides
- flannel graph
- documentary visits

Student Evaluations - done on a basis of written and oral exams.

- administered by the head of the service and the training monitor.
- a grade on behavior in class and in training is given by the permanent personnel of the school.

The grades count for 50 percent of the final exam grade.

- Two months after the opening of school, the students undergo an exam to test their intellectual technical and character aptitudes. A final exam covering all subject matter covered during the one year course.

Program Content	Theory	Practice
<u>I. Theory Courses</u>		
<u>A. General Culture</u>		
French	56 hours	
Sciences-math	20	
Civics	10	
<u>B. Study of Healthy Man</u>		
Anatomy-Physiology	30	
Obstetrics	15	5 hours
Child Rearing-PMI	15	15
<u>C. Professional Questions</u>		
Dontology	10	
Administration	10	
Methodology	15	
<u>D. Pathology</u>		
Infectious illnesses	28	
Parasitic illnesses	15	
Pediatrics	15	
Medical Pathology	20	
Medical-surgical Pathology	35	
ORL-Optomology	8	
<u>E. Public Health</u>		
Hygiene	18	
Sanitation	8	
Health education, nutrition	10	20
Microbiology	6	
<u>F. Pharmacology</u>		
	30	10
<u>G. Techniques of Nursing and securiste care</u>		
	40	70

#### H. Miscellaneous

Guided studies and course reviews

Documentary visits 26

Written and oral training reports

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440

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Technical Training - all the students must do 10 months training in the following areas:

- hospital initiation (medicine-surgery-pediatrics) 1 month
- general medicine 1 month
- surgery 1 month
- operating room 1 month
- pediatrics 1 month
- contagious medicine 1 month
- maternity (girls) 1 month
- dispensary (boys) 1 month
- large epidemics 1 month
- PMI consultations 1 month

The students must do night duty and work with a nurse of the service, the number of night duties is eight per year. They may do night duty in the central maternity. The training objectives have been elaborated on for each area and are given to the students and discussed before sending them into the field.

#### Development of the School Year

##### First period up to aptitude exam

- during the first four weeks the students receive an intensive practice in theory and technical courses at school.
- the five weeks following are for initiation to the hospital under the supervision of a monitor.
- this first period ends with an exam which permits evaluation of students according to the criteria required to exercise the profession. This is an elimination process.

Second period - from January to end of August. Teaching is conducted in the following manner:

- students go to training for four hours in the morning.
- have classes for three hours a day - one hour in the morning and two in the afternoon which gives proportion.

	<u>Training</u>	<u>Theory Courses</u>
Four first weeks	0 hours	120 hours
Thirty-five weekes following	<u>840</u>	<u>449</u>
Total	840	569

A final exam approves the studies, it comprises written and oral tests and practice in the hospital services.

#### Objectives of Initiation Training to the Hospital

(of Zinder)

The student must be capable:

1. of executing with an observant mind and judgment the following tasks:
  - clean and disinfect: bed, night table, patient's bed pan.
  - making the bed: occupied or not, change sheets and fix patient comfortably
  - hygienic care of patient
  - mouth care
  - partial and complete toilet
  - take constants (T<sub>0</sub>, P, R, TA)
  - keep temperature sheet
2. Of applying the rules of hygiene ot the patient:
  - his room
  - his food
  - his rest and sleep
  - his clothing

3. of giving hygienic advice to the patient and his family in the course of task execution.
4. of identifying the organization and functioning of the service at the heart of the hospital.
5. of working with the health team under the guidance of the nurses and monitors who are responsible.

Practical Experience  
Training Objectives: Medicines

The student works under the surveillance and is the responsibility of the nurse on duty. During the course of his training, the student must attain the following objectives:

1. Give hygienic care to the sick: washing prevention and care of scabs; oral hygiene.
2. Maintaining order and cleanliness of the work area: beds, night tables, urinals and basins.
3. Take constants: T<sub>0</sub>, R, P, TA, weight. Verify temperature sheets.
4. Preparation of exams demanded: urine, blood, s<sub>lat</sub> and send them to the laboratory.
5. Identify albumin, sugar, salt, bile pigmentation, acetone in the urine and note the results.
6. Receive new patients: prepare history chart, take constants and note them correctly on the chart, make exams demanded by the doctor, install the patient in his bed and give him the prescribed care.
7. Help in the preparation of the ambulance.
8. Distribute the medicines while keeping watch on the dose prescribed and how they are taken. Explain when and how to take these medicines.
9. Recognize abnormal signs in the T<sub>0</sub>, P, R, and TA and make a report to the person responsible for the service.
10. Follow the doctor's visit. Undertake any follow-up action required.
11. Identify and report of the signs of the main, infectious illnesses cared for.

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12. Give treatments such as they are prescribed, taking into account the rules of dosage administering and possible effects and accidents.
13. Help the nurse to prepare materials for certain, special care: puncture, probes, aspirations, special exams.
14. Give hygienic advice to the people as it would be applied to concrete cases found in the milieu.
15. Make health and nutrition education as applicable as possible to each case.
16. Insure upkeep of material, sterilization, keep things in place.
17. Write report of observations and work at the end of training.

Practical Experience  
Training Objectives: Surgery

The student works under the surveillance and is the responsibility of the nurse on duty. During the course of his training, the student must attain the following objective:

1. Give bodily hygienic care to the sick: washing, prevention of scabs, mouth care.
2. Maintain order and cleanliness of the area, beds, night tables, basins and urinals.
3. Receive new patients, prepare their history chart, ask for current analyses: urine, salt, blood.
4. Identify and record: sugar, albumin, bile, acetone and pigmentation in the urine.
5. Correctly take the P, T, TA, and R and register them.
6. Observe a patient in order to recognize abnormal signs and make a report to the head of the service.
7. Comfortably install a patient who has been operated on, put in a cast or had an accident.
8. Participate in the preparation of health materials, up-keep and sterilization.
9. Observe the development of signs and symptoms in the sick patients in the service.
10. Follow doctor's visit. Undertake any follow-up action required.
11. Observe treatment and nursing care given the surgical patients.

12. Participate in the health education applied to each case.
13. Write a report at the end of the training.

Practical Experience  
Training Objectives: Pediatrics

1. Give hygienic care to hospitalized children: washing, prevention and care of scabs, mouth.
2. Take the temperature, pulse, respiration and height according to the method taught and record them.
3. Weigh and make a curve chart. Take child's measurements and record them.
4. Recognize abnormal signs in the temperature (T), pulse (P), respiration (R) and height (TA) in the child.
5. Recognize signs of sickness and make a written observation.
6. Prepare a bottle, a formula of water and rice, a soup, etc.
7. Feed a sick child.
8. Participate in the execution of prescribed care, injection s/c, IM, medicine distribution, taking into account administrative rule of dosage, their effect and possible accidents.
9. Explain to mother method of giving medicines to infants.
10. Help the nurse in preparing material for certain special care or examinations: puncture, perfusion, force feeding, undressing and aspiration and insure surveillance of the ill.
11. Teach the mother basic hygiene: bodily and feeding of child.
12. Maintain order and cleanliness of work area and material.
13. Upkeep and sterilization of material.
14. Make nutrition and health education as applicable as possible to each case.
15. Write a report of his observations and his work at the end of training.

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Practical Experience  
Training Objectives: C.A.T. (TB)

The student work under the surveillance and is the responsibility of the nurse on duty. During the course of his training, the student must attain the following objectives:

1. Take the recommended hygienic precautions to avoid infection and contamination.
2. Recognize the signs of a sickness worsening and notify
3. Insure prescribed treatment and effect surveillance of patients showing signs of abnormalities.
4. Participate in the health education of the sick.
5. Prepare medical visits with person in charge.
6. Participate in various examinations of samples: Spittle V.S.
7. Learn to take and read tuberculosis tests.
8. Write a report at the end of training.

Practical Experience  
Training Objectives: Maternity

The student works under the surveillance and is the responsibility of the midwife and the nurse on duty. During the course of training, the student must attain the following objectives:

1. Receive the mother-to-be, install her and prepare her history chart.
2. Identify sugar and albumin in the urine.
3. Psychological and physical preparation of patient.
4. Take temperature and pulse.
5. Recognize beginning of labor.
6. Surveillance of the patient in different stages of labor and normal birth.
7. Help the midwife during birth.
8. Recognize the follow-up of normal births.
9. Give care to the new mother according to the method taught - washing the vulva.

10. Give care to the new-born according to the method taught: Cutting umbilical cord, eyes, washing, weighing.
11. Recognize abnormal signs in the new-born.
12. Teach mother proper hygiene for herself and the child.
13. Write a report at the end of training.

Practical Experience  
Training Objectives: Dispensary

The student works under the surveillance and is the responsibility of the nurse on duty. During the course of his training, the student must attain the following objectives:

1. Participate in consultations with those in charge.
2. Recognize the signs of illness treated in dispensary: malaria, gastro-intestinal problems, intestinal parasites, respiratory illness, etc.
3. Know the treatment of these illnesses.
4. Participate in prescribing care by working with method of asepsis and taking into account the rules for administering medicines: dosage, use, effects and possible accidents.
5. Explain the means of administering these medicines to sick.
6. Keep a notebook on all consultations.
7. Give hygienic advice on the body, food and home.
8. Maintain order and cleanliness of materials and work areas.
9. Upkeep and sterilization of materials in use.
10. Write report at the end of training.

Practical Experience  
Training Objectives: Division of Mobile Medicine

The student works under the surveillance and is the responsibility of the nurse on duty. During the course of his training, the student must attain the following objectives:

1. Describe the different activities of the service and recognize its role.
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2. Participate in different consultations and recognize the main illnesses cared for in the service.
3. Recognize the signs of leprosy, malaria, meningitis, smallpox, intestinal parasites, amebiasis, schistosomiasis.
4. Explain to patients the different ways of fighting against these sicknesses.
5. use and upkeep of microscope, prepare current slides.
6. Recognize the most current parasites and microbes: Intestinal, protozoa of malaria, BK, BH, diplococcus in M.C.S., etc.
7. Assist vaccinations.
8. Give prescriptions taking into account the rules of asepsis and administration of medicines.
9. Upkeep and cleanliness of work area.
10. Sterilization of materials.
11. Acquire team spirit.
12. Write report of observations at the end of training.

Practical Experience  
Training Objectives: P.M.I.

The student works under the surveillance and is the responsibility of the nurse on duty. During the course of his training, the student must attain the following objectives:

1. Welcome a patient and orientate the patient to the dispensary.
  2. Recognize a state of sickness.
  3. Correctly execute weighing babies and keep the forms to insure surveillance of the children.
  4. Observe a pregnant woman and give her hygienic advice.
  5. Participate in the distribution of medicines, taking into account the rules of usage.
  6. Recognize accidents that can set in during of after giving medicines.
  7. Explain to the mother how to use various medicines.
  8. Execute certain techniques correctly: bandaging, injections, vaccinations.
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9. Establish a diet adapted to the age and physical condition of the child.
10. Teach the mother about diets.
11. Prepare correctly: formula, bottle, soup and do a demonstration for the mothers.
12. Teach the mothers about food and vaccination hygiene by applying the methods learned (flannel graph, upkeep, demonstration).
13. Keep work area and materials in order and clean.
14. Introduce health and nutrition education as appropriate.
15. Write report at the end of training.

APPENDIX G

THIRD COUNTRY TRAINING DATA

PIO/P 1-00011	Hassane Ada, Issa Boubacar, Mahouya Argis Institute dela Formation Social; Abidjan, Cote d'Ivoire American Dollor Allotment: 27,000	9/79 - 6/82 Social Welfare Aids
PIO/P 1-00012	Mariama Djibo, Elhadji Bokar Bachabi Youssouf, Tahirou Garba, Alio Sabo Institue Superieur de Techniques Medicales; Kinshasa, Zaire \$ 35,750	9/79 - 6/82 Medical Docotors
PIO/P 1-00019	Mamane Sofo Bawa, Andre Lobito Medex Conference; Honolulu, USA \$ 10,180	9/80 - 10/80
PIO/P 1-80651	Oumarou Barti Southern University; Louisiana, USA \$ 26,049	7/79 - 6/80 Sanitary Engineer
PIO/P 1-80655	Mamane Kane, Mohammed Salissou Ferris State College; Grand Rapids, USA \$ 27,929	4/79 - 4/81
PIO/P 1-80687	Mariama Hainikoye Centre Enseignement Superieur Soins des Infirmiers; Dakar Senegal \$ 5,250	9/79 - 6/82 Degree Nurse
PIO/P 1-80688	Rene Mathieu, Sahidou Sanda Ecole d'Anathesis; Yaounde, Cameroun \$ 12,000	9/79 - 6/82 Anesthesiologist
PIO/P 1-80689	Moussa Idi, Kadri Koda Institut de la Sante Publique; Rennes, France \$ 9,160	9/79 - 6/80 Masters Program in Public Health
PIO/P 1-80690	Moustapha Elhadji Boukar, Boureime Sounna, Ahmadou Mamane Institute Universitaire de Technologie de la Sante et des Sciences Biologique; Lome, Togo \$ 18,000	9/79 - 6/82 Public Health Social Worker
PIO/P 1-90654	Mahamane Dakah, Mariama Gazibo, Djibo bingui Institute de la Formation Sociale; Abidjan, Cote d'Ivoire \$ 9,000	10/80 - 4/82 Public Health Social Worker

APPENDIX H

NATIONAL AND DEPARTMENTAL SEMINARS SUPPORTED BY RHIP

Seminars on Retraining Village Health Teams; Niamey	
January 29 - February 10, 1979	17 participants
March 19 - 31, 1979	15 participants
May 21 - June 2, 1979	25 participants
Total allotment FCFA 2.285.000 (3 seminars inclusive)	
Workshop on the National Health Program; Dosso	
July 8 - 17, 1979	40 participants
FCFA 3.301.545	
4eme Journees des Etudies; Maradi	
August 8 - 17, 1979	95 participants
FCFA 7.198.455	
Seminar on Training Village Health Teams; Niamey	
July 2 - 9, 1980	35 participants
FCFA 2.241.375	
5eme Journees des Etudies; Zinder	
August 18-30, 1980	109 participants
FCFA 13.690.000	

APPENDIX I

DISTRIBUTION OF MOBYLETTES

Ministry of Public Health and Social Affairs - Rural Health Improvement Project

Delivery of 78 Mobylettes February, 1980 to:

Niamey Department - 15 Mobylettes

- 1) CM Ouallam (PM Nangaize)
- 2) CM Tillabery (PM Famale, Sara Koiri, Sansane Haousa)
- 3) CM Tera (PM Dargol, bolbel, Larba Birno)
- 4) CM Say (PM Tamoua, Nakalondi)
- 5) CM Ny-Ardt (PM Karma, Hamdallaye, Dantrandou)
- 6) CM Filingue (PM Tabla, Sanam)
- 7) CM Ny Commune

Agadez Deaprtment - 5 Mobylettes

- 1) CM Arlit - 1
- 2) CM Ingall - 1
- 3) PMI Agadez - 1
- 4) Reserved for DDS - 2

Dosso Department - 12 Mobylettes

- 1) CM Doutchi (PM Dogonkina)
- 2) CM Boboye (PM Kouassi)
- 3) CM Dosso (PM Noussadey)
- 4) CM Gaya (PM Tanola, Bengou, Kasuran Debe, Kara Kan)
- 5) CM Dosso (PM Farrey, Nokko, Garankedey)
- 6) Reserved for DDS - 2

Maradi Department - 15 Mobylettes

- 1) CM Aguié (PM Gazaoua, Tehadoua)
- 2) CM Dahoro (PM Kornaka)
- 3) CM G. Roudji (PM Tibii, Chadakou, Sae)
- 4) CM Madarounfa (PM Dan-Issa, Gabi, Nelwa, Safo)
- 5) CM Tessaoua (PM Kargom, Kosna)
- 6) Researved for DDS - 3

Tahoua Department - 12 Mobylettes

- 1) Tahoua DDS
- 2) Kalfou (Tahoua)
- 3) Tamaske (Keita)
- 4) Ibrohamane (Keita)
- 5) Garhegou (Bouza)
- 6) Toma (Bouza)
- 7) Garadona (Bouza)

- 8) Azerori (Madan)
- 9) Farlale (Madan)
- 10) Bangui (Madan)
- 11) Ilela
- 12) Tajae (Ilela)

Zinder Department - 12 Mobylettes

- 1) Zinder Commune
- 2) Mirriah (PM Kassama, Dogo, Guodiguir)
- 3) Matamey (PM Kantche)
- 4) Magaria (PM Nacha, Bande, Sassoumbroum)
- 5) Tanout (PM Oillelewa, Belbegi)
- 6) Goure (Birni Kazoe, Kelle)

Diffa Department - 6 Mobylettes

- 1) CM N-Guigmi - 1
- 2) CM Diffa - 1
- 3) CM Maine-Sorse - 1
- 4) PM Bosso - 1
- 5) PM Gueskeren - 1
- 6) PM Bhetiman - 1

APPENDIX J

DISTRIBUTION OF VEHICLES

Ministry of Public Health and Social Affairs - Rural Health Improvement Project

Delivery of 10 vehicles March, 1980.

Department	Registration No.	Type of Vehicle	Chassis No.
Diffa	1620 NY1A	Pick-Up	53.746
Dosso	0122 D01A	Pick-Up	53.709
Tahoua	0175 TA1A	Pick-Up	53.673
Zinder	0164 ZR1A	Pick-Up	53.746
Maradi	0145 MuA	Pick-Up	54.105
Agadez	0102 AZ1A	Pick-Up	54.086
Niamey-DHMM	1457 NY1A	Pick-Up	54.092
Niamey-Bureau	1458 NY1A	Station Wagon	54.060
Niamey-Bureau	1459 NY1A	Station Wagon	53.056
Niamey-Bureau	1835 NY1A	Pick-Up	

## APPENDIX K

### POSITION DESCRIPTIONS

#### A. Sanitary Engineer (Niamey)

1. Duties - Under the technical direction of the Ministry of Public Health and Social Affairs and in collaboration with the WHO Sanitary Engineer assigned to the Service d'Hygiene et d'Hygiene et d'Assainissement of the Ministry of Public Health, the Sanitary Engineer assigned to Niamey will assist in:

- a) the development of a country-wide environmental sanitation program with an emphasis on rural sanitation;
- b) the development of plans to resolve the sanitation problems of the large municipalities in the country;
- c) providing professional advice on matters related to water supply, water pollution control, sewage disposal, insect vector and rodent control, storm drainage, urban hygiene and refuse sanitation, as requested;
- d) the development of projects to improve the environmental sanitation of rural villages;
- e) providing, as required, the Sanitary Engineer stationed in Zinder, assistance in the preparation of the curriculum and training aids for the training program of Sanitary Agents at ENICAS;
- f) the preparation of the environmental sanitation aspects of the initial and recurrent training program of the Village Health Teams as well as those programs aimed at public schools, rural villages, and maternal and child health care centers;
- g) the planning and design of environmental sanitation improvements to be made at health centers and dispensaries supported under the Rural Health Improvement Project, #683-0208;
- h) providing assistance in the implementation of the environmental sanitation aspects of the RHIP, #683-0208.

#### 2. Communications

- a) The Sanitary Engineer will keep the Africare Chief of Party informed of his activities and, as requested, will consult with the RHIP Project Director and/or USAID Health Development Officer.
- b) A systematic reporting mechanism will be established in accordance with USAID and GON approved evaluation team recommendations.

#### 3. Qualifications - Candidate must have:

- a) a graduate degree in Sanitary or Environmental Engineering with a minimum of 5 (five) years' experience in

- environmental engineering and sanitation; prior experience training sanitarians is desirable.
- b) the ability to speak, read, and write French at the FSI 2+ Level.
  - c) A length of tour in Niger of 2 years.

## B. Sanitary Engineer (Zinder)

1. Duties - Under the technical direction of the Ministry of Public Health and social Affairs and in collaboration with the WHO Sanitary Engineer assigned to the Service d'Hygiene et d'Assainissement, the Sanitary Engineer assigned to Zinder will provide assistance, as requested, to the Sanitary Engineer based in Niamey in the accomplishment of the duties outline under A.1.a, c, d, f, and g, above. In addition, the sanitary Engineer (Zinder) will assist in:

- a) the planning of the theoretical and practical training program for Sanitary Agents at ENICAS, including, but not limited to:
  - i) the design and preparation of curriculum and course material which may eventually be used in training programs for public schools, rural villages, and maternal and child health care centers, and
  - ii) the development of practical projects in the Department of Zinder for the field training of the Sanitary Agents at ENICAS.
- b) the design and preparation of a training program for Village Environmental Hygiene Workers to permit their being effectively incorporated as part of the Village Health Team.
- c) providing practical assistance in the implementation of the environmental sanitation aspects of the RHIP #683-0208.

## 2. Communications

- a) The Sanitary Engineer will keep the Africare Chief of Party informed of his activities and, as requested, will consult with the RHIP Project Director and/or USAID Health Development Officer and/or the Niamey-based Sanitary Engineer.
- b) A systematic reporting mechanism will be established in accordance with USAID and GON approved evaluation team recommendations.

## 3. Qualifications - Candidate must have:

- a) a graduate degree in Sanitary or Environmental Engineering with a minimum of 5 (five) years' experience in environmental engineering and sanitation; prior experience training Sanitarians is desirable.
- b) the ability to speak, read, and write French at the FSI 2+ level.

c) A length of tour in Niger of 2 years.

## APPENDIX L

### POSITION DESCRIPTION

CHIEF OF PARTY: PUBLIC HEALTH PHYSICIAN

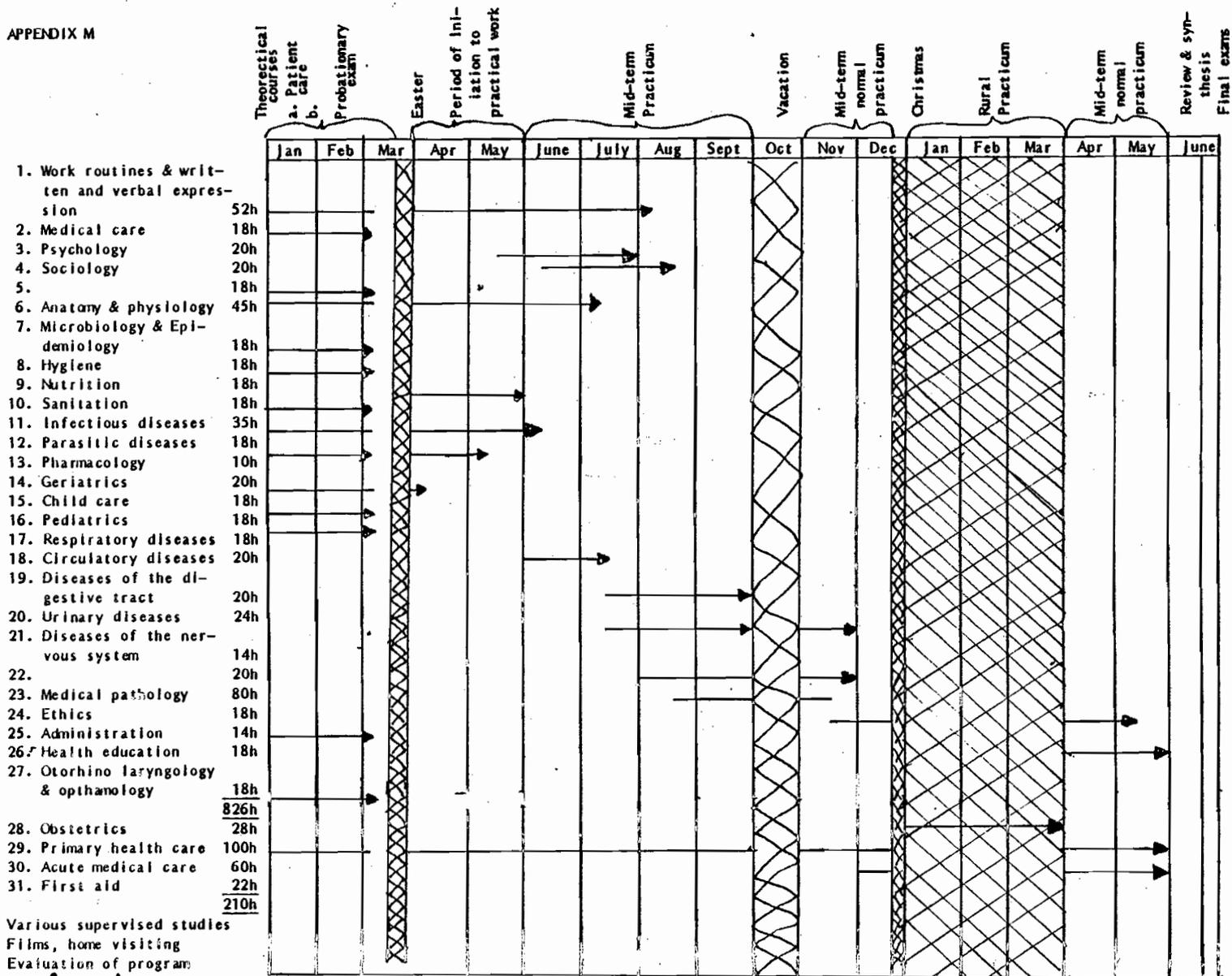
#### Duties

1. Serves as Chief of Party of the technicians assigned to the RHIP. Reports to Mission Health Development Officer, MOH Project Director, and is responsible for establishing and maintaining collegial relations with the Project Manager within the Ministry of Health.
2. Responsible for coordinating technical support of all expatriate personnel employed by the project, regardless of mechanism by which they are employed.
3. Cooperates with MOH Division Directors in program activities related to the RHIP and in advisory capacities as appropriate.
4. Personally provides technical assistance in all areas related to project activities with assistance of U.S.-funded expatriates in collaboration with Nigerienne colleagues.
5. Assists Project Director, Project Manager, and USAID Health Development Officer in scheduling and programming project activities.
6. Participates in organization and implementation of in-service training and other activities.
7. Assists in development of studies and educational activities as needed.
8. Prepares quarterly Project Progress Reports in French and English for the GON and USAID.

#### Qualifications

1. Essential to have objectively tested ability to speak, read, and write French at FSI 3 level.
2. Medical Doctor or Doctor of Public Health degree plus experience.
3. Master of Public Health degree or equivalent formal public health training (D.T.M.H. plus other training, etc.)
4. International experience with project responsibility for primary health care, public health, or a low-cost delivery system for at least five years in developing countries.
5. Personal good health and accompanying family health of a level sufficient to tolerate living in Niger for an extended period.

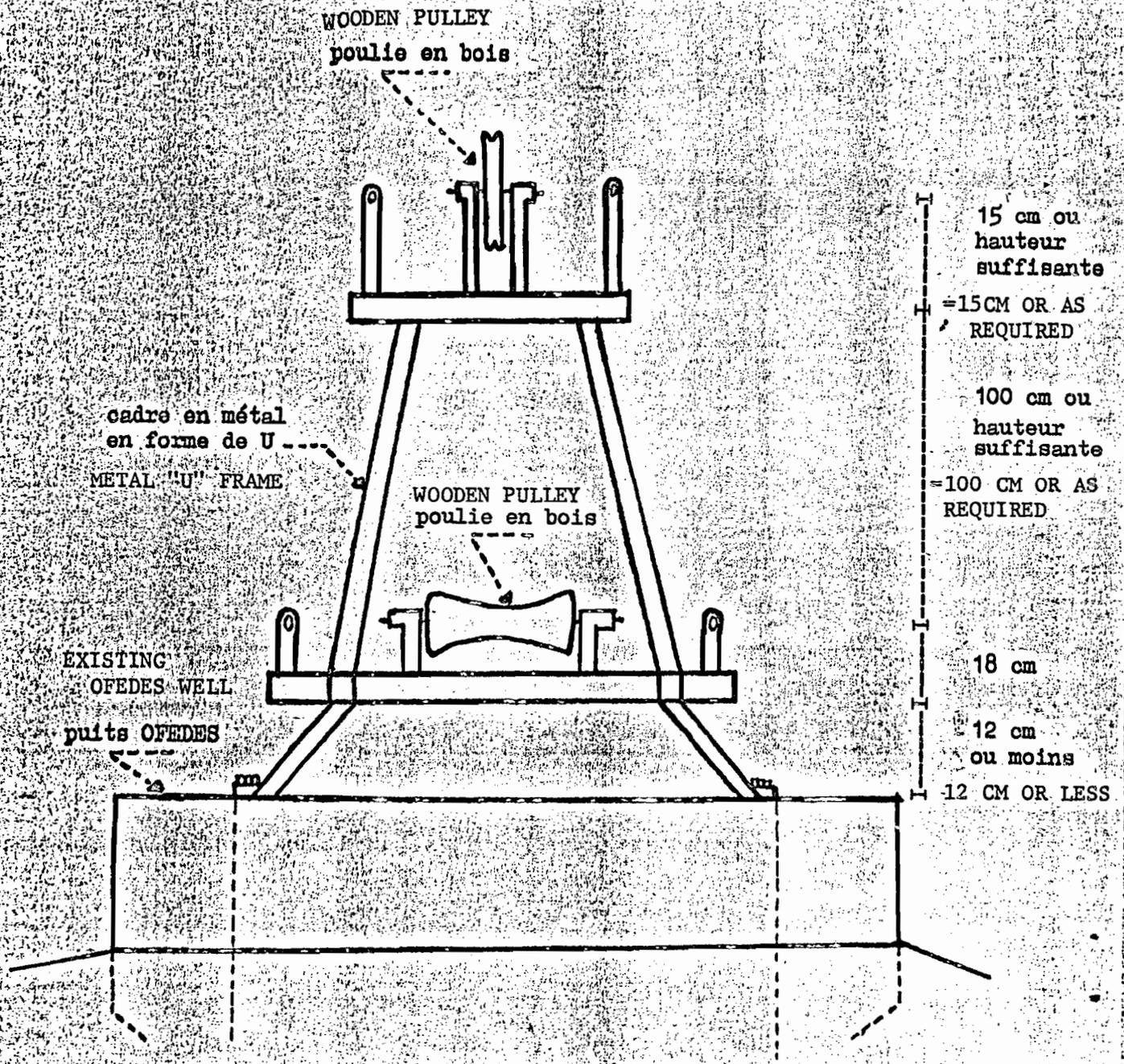
APPENDIX M



APPENDIX N

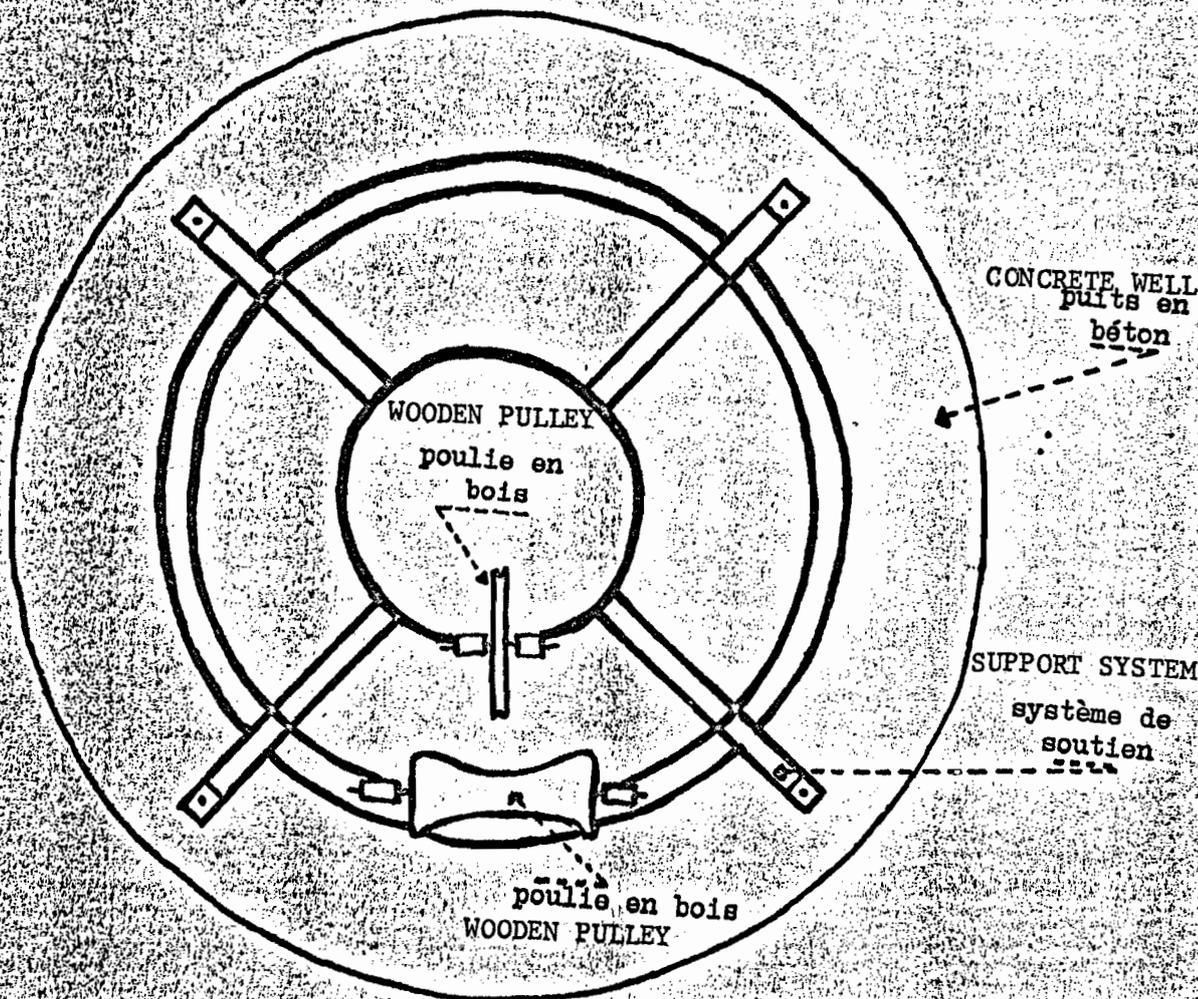
ADAPTATION OF LIFTING SYSTEM USED AT IRRIGATED GARDEN WELLS IN  
THE AREA NEAR AGADEX TO BE FITTED TO REINFORCED CONCRETE  
WELLS CONSTRUCTED BY OFEDES

- A. The lifting system should be designed to permit 3 or 4 animals to use each well at the same time.
- B. To the maximum extent possible, local materials should be used, especially on moving parts which are subject to wear.
- C. Adoption and modification of the design for improved wells at Mayahi in the Department of Maradi form the basis for the following preliminary design sketches which follow. With permission of the Ministry of Hydraulics, the first pilot models should be established at a completed well at Mayahi in Maradi Department to reduce initial cost.

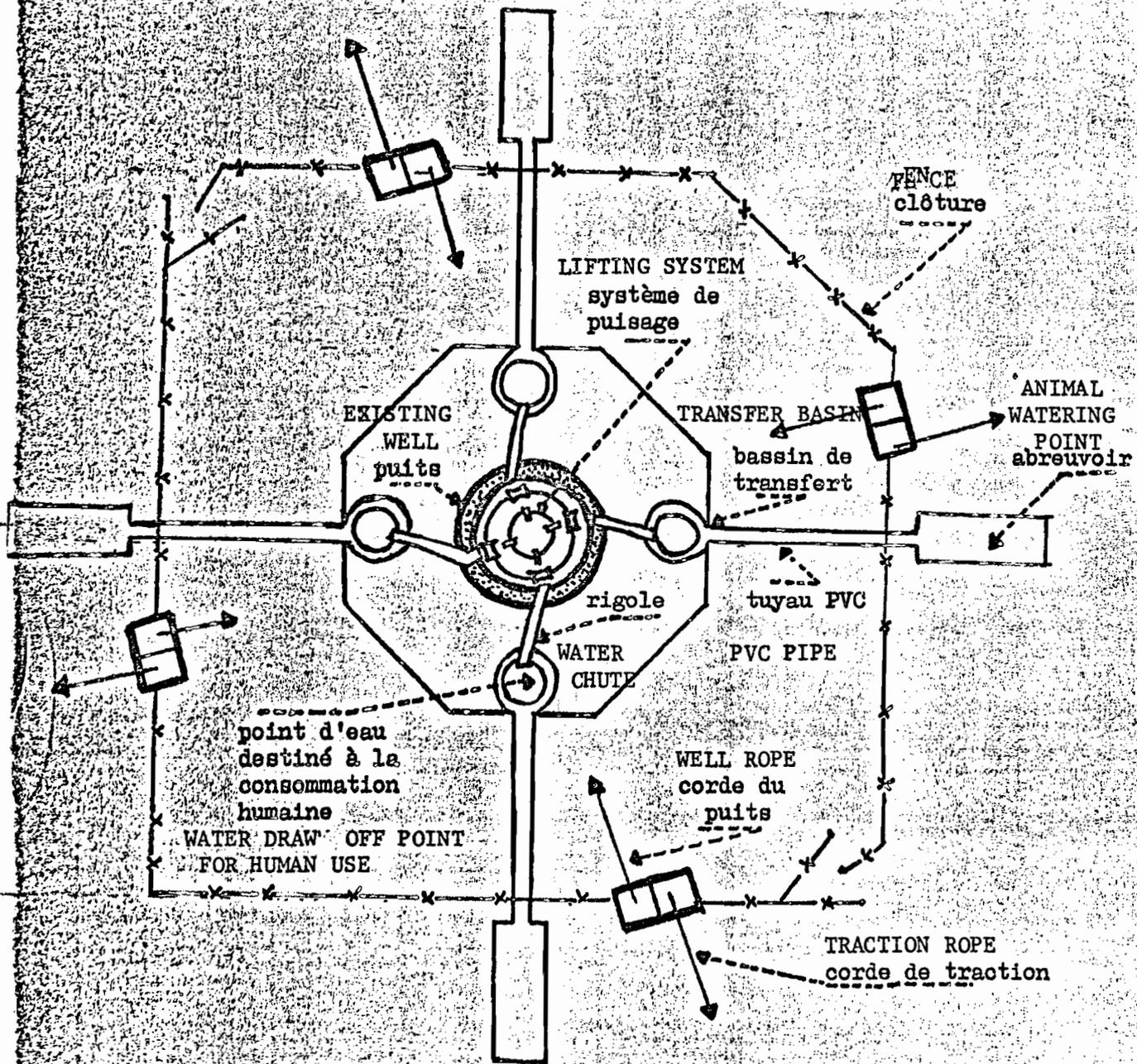


SCHEMA 1 - Système de puisage vu de côté.

SIDE VIEW OF LIFTING SYSTEM



Note : le système de puisage avec la poulie se répète sur chaque cadran.  
 NOTE: THE PULLEY LIFT SYSTEM IS REPEATED ON EACH QUADRANT OF THE SUPPORT SYSTEM  
 SCHEMA 2 - Système de puisage vu d'en haut.  
 PLAN VIEW OF THE LIFTING SYSTEM



SHEMA 3 - Plan suggéré pour le système de puisage dans un puits du type de ceux de Mayahi.

SUGGESTED LAYOUT OF LIFTING SYSTEM AT MAYAHI TYPE WELL

APPENDIX O

DONALD MALBERG - LOGISTICS AND COLD CHAIN SPECIALIST  
SCHEDULE OF MEETINGS AT THE CENTER FOR DISEASE CONTROL  
(ATLANTA, GEORGIA), PRIOR TO DEPARTMENT FOR NIGER

Tuesday, 10 March 1981

Arrive Atlanta from Sacramento - to Sherton-Emory                      Evening  
Stanley O. Foster, MD, Director, R&D Div., Sherton-Emory      Evening  
International Health Program Office (IHPO)

Wednesday, 11 March 1981

Andrew N. Agle & Robert J. Baldwin (IHPO)	Freeway Park, Rm. 175	7:30-10:45
J. Michael Lane, MD, Director, Center for Prevention Services (CPS)	Bldg. 1, Rm. 3007	11:30-12:30 (Lunch)
J. Donald Millar, MD, Asst. Director for Environmental Health (for Chief of Smallpox Eradication Program)	2049	12:30-1:00
Donald R. Hopkins, MD, Asst. Director for International Health	Bldg. 1, Rm. 2122	1:00-2:00
Billy G. Griggs, Acting Dir., IHPO	Bldg. 14	2:00-3:00
Roger H. Gernier, Ph.D., Immunization Div., CPS (Former SEP Operations Officer/Niger)	Bldg. 6, Rm. 256B	3:00-5:00

2011