

#14

1. SUBJECT CLASSIFICATION	A. PRIMARY	PUBLIC HEALTH
	B. SECONDARY	INTEGRATED DELIVERY SYSTEMS

2. TITLE AND SUBTITLE
 Nicaragua: DEIDS reconnaissance, Nov.29-Dec.6,1972

3. AUTHOR(S)
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4. DOCUMENT DATE 1972	5. NUMBER OF PAGES 74p.	6. ARC NUMBER ARC
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7. REFERENCE ORGANIZATION NAME AND ADDRESS
 American Public Health Association, Division of International Health Programs,
 1015 Eighteenth Street, N.W., Washington, D.C. 20036

8. SUPPLEMENTARY NOTES (Sponsoring Organization, Publisher, Availability)

9. ABSTRACT

The American Public Health Association, under a contract with the Agency for International Development, has designed a program in public health improvement which is called the Development and Evaluation of Integrated Delivery Systems (DEIDS). The activity is designed to assist countries to demonstrate how to establish health delivery systems within seven years. Such projects include, but are not limited to, Maternal and Child Health and Family Planning and Nutrition. The projects are to cover large populations in predominantly rural areas. They are to utilize in-country resources for the service component, although external assistance organized by DEIDS is available for planning, evaluation, training, and limited amounts of essential equipment. It is expected that successful health delivery systems can be subsequently replicated in the country or in the region.

These are phases through which DEIDS projects proceed:

- a) Phase I -- reconnaissance within a specific country or region, to gather information about disease patterns, health services as currently organized, local resources, cultural aspects, community involvement, the potential for integration of various parts of public health, opportunities for innovation, current and potential staffing, training, supervision, emphasis upon preventive services, outreach, cost, and evaluation
- b) Phase II -- Detailed planning. This phase begins if the survey in Phase I recommends it, and involves experts from the host country as well as experts assigned by DEIDS.
- c) Phase III -- Pilot Project Operations, which continue for as long as eight years.

10. CONTROL NUMBER PN-AAB-573	11. PRICE OF DOCUMENT
12. DESCRIPTORS	13. PROJECT NUMBER
	14. CONTRACT NUMBER CSD-3423 GTS
	15. TYPE OF DOCUMENT

NICARAGUA

DEIDS Reconnaissance
November 29 - December 6, 1972

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INTRODUCTION

The first complete draft of this report on Nicaragua was mailed out to the team members for comment on December 23, 1972. That night Managua was destroyed. Our distress at the suffering of the people there is keener because of our recent study and our acquaintanceship with some of the leaders in the health field. Although we realize that the catastrophe has to revise priorities in Nicaragua, we have edited and are submitting this report on the health services in Nicaragua as we saw them early in December.

Our thanks and sympathies are extended to the many who assisted us in learning about their country.

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I. Summary and Recommendation

Although our visit to Nicaragua was short, the team learned a great deal and have some impressions which will affect our comparison of the advantages and disadvantages of having an APHA project in that country.

A. There are several strong points which make the team believe that the climate is favorable to the establishment of an APHA project in Nicaragua.

1. The political and economic stability of this country lead us to believe that once a DEIDS project were agreed upon, the support for it over a long period of time would be adequate to give it a fair chance of success.

2. Many of the people with whom we talked and whom we heard talking indicated that change was "in the wind" for health services and we feel that whenever change is being considered the opportunity for improvement is always there.

3. We were encouraged by the discussions which have been initiated regarding the integration of some of the other medical care systems with the Ministry of Health. Again, this type of discussion, with the possibility of

changes, makes the establishment of an integrated health system much more likely.

4. We were greatly impressed by the extent of coordination which exists between the Ministry of Health, the Ministry of Education, and the Ministry of Agriculture. Both PINAJE and PRODUSAR projects seem to be promising ventures.

5. All the way from the center to the periphery our team was greatly impressed by the quality of people working in the Ministry of Health. Although we did not have the opportunity of talking with very many persons in any one category, we found that the doctors and the auxiliaries were interested in their work, were competent and were people with whom we would enjoy working.

6. We felt that the PUMAR program gives a strong indication of the desire and ability of the Ministry of Health to adopt innovations and to carry them through.

7. The Minister spoke about the important place which auxiliaries have in the Ministry of Health and the expectation that their responsibilities could be increased.

8. The training and utilization of village health representatives was another encouraging factor. We heard briefly about the beginning of this type of activity in the

Puerto Cabeza area, about the training program which is being undertaken along the highway between Rama and Juigalpa, about the activities in PRODUSAR for encouraging village leadership, about the agricultural clubs which were being sponsored by the Ministry of Agriculture and the emphasis which they were putting on health measures and about the way voluntary collaborators help in SNEM.

9. We were also encouraged by the fact that the people of Nicaragua, no matter how poor they were, were encouraged to pay, at least in part, for medicines and services. This attitude makes it possible for the heavy load of curative care to be shared by people, rather than having the full burden fall upon the Government.

10. The curriculum change which is taking place at the medical school in León is also a strong point which would favorably affect the decision regarding an APHA project in Nicaragua. The changes should result in a physician who is somewhat better equipped to work in rural areas than the past products of that medical school.

B. In contrast, there are two points which are potentially difficult. These points might be unfavorable for the establishment of a DEIDS project. At least, they are points which will require negotiation, if work is begun on detailed plans.

1. First is the matter of integration. Although theoretically the integration of the hospital systems of Nicaragua into the Ministry of Health should be beneficial and result in a more cost-effective health system, we would like to call attention to the fact that adding the responsibility for the total curative load of Nicaragua to the present responsibilities of the Health Ministry might overshadow the promotive and preventive aspects of its work. The mere overshadowing is not what is to be feared, but the possibility that resources which are now devoted to promotive and preventive aspects will be drawn into curative uses if complete integration is achieved. This is natural because people want curative medicine and Government likes to keep people happy. In order to prevent the erosion of resources for public health and to place adequate emphasis upon the preventive and promotive measures, it may be necessary to reserve a fair allotment of time and resources for those activities.

2. The second major difficulty has to do with budget and the possibility of reallocating resources within the Ministry of Health. For these problems there are no easy solutions and our stay was far too short to be able to make concrete suggestions. However, here are some possibilities which may be given further consideration:

a. that auxiliary personnel be used for a greater range of functions, so that expensive professional time can be limited and conserved.

b. that professional salaries for full-time work be raised, so that a few key supervisors can give full attention to their work and not have to worry about private practice or supplementary employment.

c. that more provisions be made for reaching out of the health center and out of the towns to the rural areas.

d. that the emphasis of such outreach programs be on promotive and preventive aspects.

e. that community leadership and involvement be further developed so rural people can participate in identifying their health problems, in seeking solutions for those problems, and in carrying out the remedial programs.

3. A more pervasive question is whether or not the Government is serious about a comprehensive rural development program, which might have to be concomitant with major improvements in a health delivery system.

C. Recommendation

Conditions and potentialities in Nicaragua are such that it should be possible to design a DEIDS project which would have a good chance of success.

Therefore, Nicaragua should continue to be considered as a strong contender for the Latin American DEIDS project, pending the completion of reports on other countries visited and a comparative analysis of disadvantages and advantages in each of them.

II. General

A. Geography

Nicaragua, with an area of 57,100 square miles, is the largest of the Central American Republics. It occupies a south-central position in Central America, with Honduras on the north, the Caribbean Sea on the east, Costa Rica on the south, and the Pacific Ocean on the west.

The western part of the country consists of a coastal plain only slightly higher than sea level but gradually rising toward rugged mountains. Occasional volcanic peaks are 3,000 to 5,000 feet high. Beyond the mountains lies the interior, a sparsely inhabited wilderness of timbered plains and rolling hills cut by rivers. The eastern coastal plain extends 40 to 50 miles inland and is partly swamplands.

Nicaragua is situated in tropical latitudes, the mean average temperature in the Pacific coastal region being about 81° F. In areas of higher elevation in the central highlands, there are limited areas of mild climate and even cool climate. The Caribbean coast and eastern slopes of the highland and the southern part of the rift are wet tropics the year round with only a short and interrupted winter dry period. The western slope of the central highlands, the

northern end of the rift, and the volcanic ranges of the west have a wet and dry tropical climate. The dry season here is several months long in winter and early spring.

Although Nicaragua is much less urbanized than many mid-latitude countries, there is a significant concentration of urban places and an associated infrastructure. This complex extends from the cotton center of Chinandega, and its associated deepwater port, Corinto, on the north, through the new port of Puerto Somoza and León, to the Managua-Jinotepe-Granada complex on the south and the associated ports of Masachapa and San Juan del Sur. A secondary, less urbanized area in the central highlands extends from Somoto on the Pan American highway near the Honduran border to the North to the coffee center of Matagalpa on the south. The rest of the urban places of Nicaragua, including the old settlements of the east coast are typically small and are widely scattered.

Nicaragua has embarked on a program of highway development. The two most spectacular achievements have been the essential completion of the Nicaraguan portions of the Inter-American (Pan American) Highway, extending from the Honduran border to the west of Somoto to the Costa Rican frontier at Peña Blanca. At Managua this route meets the

local network of improved roads which serves the Central Lowlands (Great Rift plus the coastal plains west of León) from Corinto and Chinandega on the north to Granada, Masachapa, and Jinotepe on the south.

B. Administration and Politics

Nicaragua is a constitutional republic with universal suffrage for men and women. The highly centralized government structure is divided into three branches: executive, legislative, and judicial. The political system has for many years been headed by a truly dominant executive branch, one supported by a loyal and professional military establishment. The country has had a long history of strong executives, yet political change was frequent and usually in the form of coup d'etats, revolts and civil wars involving personal and factional armies. With the support of the National Guard, the Somoza family and its political allies in the Liberal Party have maintained uninterrupted rule since 1936. The nature of political change has thus become less a matter of change in leadership and more a matter of how an established leadership has instituted change over time.

Since Nicaragua is a unitary political system, there are no political divisions which share power with the

national government. Nicaragua is divided into 16 departamentos and 122 municipalidades.

There is little local political autonomy or fully competitive local elections. The majority party controls the majority of local elective offices and appoints its executive leadership. There is little evidence of widespread participation in the local political process, and it tends to be more confined to local personalities and local issues. Participation and concern become much less evident in the rural areas.

C. Demographic and Statistical Data

The population of Nicaragua was estimated at 2.2 million in 1972 and is growing at an annual rate of 3 percent. Forty-five percent of the population is urban. About 50 percent of the population 10 years of age and older is literate.

Of the country's three geographical zones - Pacific, North and Central, and Atlantic - the Pacific Zone is the most populous with 58.2 percent of the population; last is the Atlantic Zone with 6.6 percent. The trend has been for the Pacific Zone to continue to grow at the expense of the other two zones, and it appears the trend will continue.

At the present time there is no great concern on the part of the people or of the government with overpopulation. Although there are high densities in some areas, the overall population density is not high nor is it expected to be in the near future. The high population growth rate and increasing urbanization are viewed as economic problems. It is felt that efforts should aim at increasing the economic growth rate rather than decreasing the population growth rate.

D. Economics

The Nicaraguan economy grew at an annual rate of 8 percent during the years 1961-65, increased cotton exports having provided the main thrust for this very high rate. Largely because of drought affecting cotton, coffee, and sugar, which together account for more than half of Nicaraguan exports, the growth rate dropped to 3.5 percent in 1966 and 4.2 percent in 1967. Exports totaled about U.S. \$177.8 million in 1970, imports U.S. \$177.7 million.

No statistical data are available regarding income distribution, but certain partial indicators point to marked disparities. The effects of the past years of economic expansion have not yet filtered down to any considerable extent in the form of popular education, public health, and other

investments in "human capital". Gross national product and per capita production in 1960 and 1970 are as follows:

1960	C\$ 1,732	US\$ 247
1970	C\$ 2,501	US\$ 357

E. Educational Level and Distribution

In the field of education Nicaragua has made several important advances since 1950, but there remain many problems. While illiteracy declined by 13.1 percent during 1950-1963, it remained at the relatively high level of 49.5 percent. Although school enrollment has increased at a faster rate than the increase in population, less than 55 percent of the school-age population is enrolled in primary school, less than 10 percent in secondary institutions, and approximately 1 percent in institutions of higher learning.

Public primary education is free and compulsory, but many children drop out of school because economic conditions force them to work at an early age. Despite the legal basis for the access of all classes to education, early termination of schooling is prevalent. Only 7.2 percent of the children enrolled in primary schools finished the sixth grade in 1964, and less than 50 percent of the first year students in academic secondary schools were graduated.

Secondary school education is viewed by the Nicaraguan government as crucial for the preparation of students for university-level education, the training of specialized labor for different economic activities, and the preparation of teachers at the primary school level. However, secondary schools and institutions of higher learning are producing insufficient agronomists, teachers, doctors, and other professionals to meet the needs of the country's economic and social development.

F. Religions, Cultures, and Ethnic Groups, Including Health Beliefs and Systems

It is estimated that about 70 percent of the people are mestizo (European/Indian), 17 percent white, 9 percent Negro, and about 4 percent Indian. The Indian and Negro population is concentrated on the Atlantic Coast, but there has been increasing migration to Managua in recent years. Nicaraguan culture follows the basic lines of its Ibero-European ancestry, with the Spanish influence being dominant. Catholicism is the major religion (about 96 percent of the population), but religious tolerance is widespread.

In general, traditional folk beliefs about the causes and cures of various ailments hinder programs of

preventive health care and environmental sanitation. Where available, doctors and health clinics are in demand for curative services. On the other hand, programs of child care, personal hygiene, food preparation and storage, waste disposal and decontamination of water do not always receive ready acceptance.

G. Policies and Laws

1. Family planning services are provided by the Ministry of Public Health, by the National Social Security Institute and by the Moravian Missions. In 1970 a family planning association was set up from the IPPF Western Regional Office.

Although there is a Government family planning program and a considerable amount of support exists within official and professional groups for family planning, there is no official Government policy on population.

There are legal restrictions on the sale and import of contraceptives, but these are on sale as health measures. Abortion is illegal.

2. The Ministry of Health is utilizing paramedicals, in some cases to provide primary medical care on their own initiative. However, we could not determine if this were strictly within the law, or if the practice was condoned as a matter of expediency or necessity.

III. Health Administration Responsibilities and Activities

The overall health system of Nicaragua contains both official and unofficial segments. Our incomplete analysis shows that the health services for which various agencies are responsible are not closely coordinated. Fragmentation is both geographical and functional. Within the same geographical location two or more agencies may have parallel functions. At the functional level, two or more agencies may have duplicated or overlapping responsibilities. However, one should not get the impression of a totally ineffective system. The separate responsibilities of the various agencies are reasonably well defined.

In September 1972 the First Congress of Health brought the several health and medical care agencies together. They discussed health problems and resources of the country and began work on a plan of integration. A continuing commission was set up, with the Minister of Health as Chairman. There is evidence of increasing cooperation between the agencies and the net effect is one of a reasonably coordinated and dynamic health system.

The overwhelming limitation of resources affects every segment of the system. Each agency apparently attempts to deliver those health services which are its responsibility with the full recognition of their inadequacy, inadequacy both in kind and in coverage. Most elements of the health system are, in effect, overwhelmed by this tremendous need for health services and the inability to provide them.

A. The official elements of health care in Nicaragua

are the responsibilities of the following:

1. The Ministry of Public Health(MSP) is a well organized and centrally directed health system, mainly responsible for health promotion and health protection services.

Health centers of the MSP also provide ambulatory medical care, but the Ministry does not have responsibility for hospital care. It is important to know that in this small country, power is concentrated within the central Ministry and that regional and local organizations have relatively little autonomy. The Ministry of Public Health has six major divisions: promotion of health, protection of health, administration, general technical services, medical care, and planning and evaluation. (Appendix C, Table 1)

The Ministry is organized at four levels: central, regional, departemento and local. The country is divided into three main regions: the Pacific Coastal area, the Central Mountain area and the Eastern Atlantic Coastal area. Currently only the first of these regions has an administrative head, and the rest of the departamentos are responsible directly to the center.

The actual delivery of health services by the MSP seems to be at the departemento and local level. Certain

programs have teams which are based at departamento headquarters, their work being spread through the departamentos. (Facilities of MSP are shown in Appendix C, Table 2)

Most primary medical attention is delivered locally by health centers. These usually have a doctor on the staff, although the more rural sub-centers do not. A typical health center would be in a town between 10 and 20,000 persons. It would be housed in a relatively acceptable building of four to seven rooms. Staff would consist of a part-time doctor, a graduate nurse, a health educator, two or three nurse auxiliaries, two or three sanitarians and some maintenance workers. The centers are open from 7:30 a.m. to 1:00 p.m. However, the doctor is usually employed for two or four hours. Patient load at the centers we saw varied between twenty and forty per day. Most of these were women with children seeking maternal or child health care and nutrition advice. Some of the health centers have special programs in nutrition, organized and supported locally, where malnourished children between the ages of 2 and 6 attend daily and are fed balanced meals.

The same health center is used for family planning clinics in the afternoon. Usually the same staff is paid by

the family planning program to conduct these afternoon clinics. The attendance at these clinics ranges from 5 to 25. Sometimes women from rural areas, who are attending the medical clinic in the morning, receive family planning advice and assistance at that time.

In general, the activities of the health centers seem to focus on nutrition, maternal and child health, immunizations, tuberculosis control and family planning.

One striking impression about the health centers is that staff concentrate their efforts and care on the local town, with outreach to the rural areas being minimal. Care is given to those who choose to come to the clinic and relatively little is done with those who never get on the clinic roles. The sanitary inspector and one or two of the auxiliaries do make regular house visits, but these are chiefly in the town rather than in the countryside.

Another strong impression is that the personnel of the health centers seem to be reasonably well trained and perform their tasks adequately. Many show initiative and a strong desire to do their work well. There is a great deal of local coordination, with evidence that health center staff cooperate with local educators and agriculture

inspectors in joint programs. The morale of the health workers seems high. The staff we met were intelligent, hard-working persons, trying their best under very difficult circumstances.

There is no clear way to get an estimate of the actual coverage of the population by the MSP services. Those that are receiving care tend to live in towns and cities. The larger the city the greater chance of having access to medical care.

2. The National Institute of Social Security (INSS) is an autonomous agency which is financed by contributions of workers and employers. About 7 percent of the population is eligible for medical care from this system. The INSS is concentrated in urban and industrial areas, which means that its facilities are found in a few cities and in the mining areas. In general, it provides a high quality of medical care in rather modern hospitals and through out-patient clinics. Physicians who work for the INSS receive more money per hour's work than those who work for the MSP, although often a physician will work for the MSP for some part of the day and for INSS for another part of the same day.

3. The National Commission for Social Welfare (JNAPS) is a group of individuals, under the leadership of the wife of the head of the ruling political party, responsible for the administration of the National Lottery. The funds obtained are used to construct and maintain hospitals. In addition, 16 of the larger localities have committees made up of community leaders which are responsible for administering 23 local hospitals. They also have the power to raise local taxes, which supplement funds from JNAPS. In general, all of these hospitals are in desperate financial straights. They are overcrowded and the demands made on JNAPS for support are overwhelming. A most fascinating experiment at this period is an attempt to coordinate the hospital development program in the country. Essentially, INSS is contracting to pay JNAPS hospitals for taking care of their clients, rather than building and running facilities on their own.

4. In addition to the health center system, which is described above, the malaria eradication program (SNEM) has a network of personnel throughout the country. At the periphery are about 4,000 voluntary collaborators. These people take blood smears on all persons who come to them with fever and give them presumptive treatment for malaria.

The farthest out full-time workers for SNEM are the evaluators. There are approximately 100 of them and their function is to visit every voluntary collaborator each month to restock supplies and collect slides. They also do some house visiting if there is no voluntary collaborator in the area or if there is some other special reason. Supervising these evaluators are 30 sector chiefs. Each of the sector chiefs has responsibility for two or three spray teams and for three to five evaluators. Above the sector chiefs are five zonal chiefs, who are non-medical administrators. Each zone has a laboratory section attached. The national headquarters for SNEM is headed by a medical officer who is assisted by a health educator and an epidemiologist, also medical.

SNEM began operations in the year 1957-58. The attack phase began in 1959 with the use of DDT. Some resistance to this insecticide was found as early as 1961 and after that other insecticides were used. In 1968 all agencies cooperating in SNEM decided that there should be an all-out program of heavy spraying, use of anti-malarial drugs, and larvicides. However, this program was found to be ineffective. For the past two years they have been using Baygon, but because of budget shortages are limiting the

spraying operations to the most susceptible one-half million people.

SNEM has developed a map of every inhabited area which systematically numbers every dwelling. The maps form the basis of planning for total coverage by the spraying teams. The teams also take a total head count, including temporary residents, at every spraying cycle. These are said to be quite accurate and were used in some places to check the accuracy of the last census. These maps and records might be used in devising the DEIDS record and evaluation system, although the "headcount" would probably need to be expanded into a listing of names, along with age and sex.

We raised the question as to whether or not SNEM personnel might have enough time to assist in other health services. The reaction was that when SNEM is in the attack phase, all workers are fully occupied. However, in areas that reach the consolidation phase, part of the time of the staff might be made available.

It should be recognized that malaria eradication will continue to be a difficult problem in Nicaragua. It is not likely that resources of the malaria services can be reallocated in the near future.

B. External Assistance

1. The Acting Director of the Pan American Health Organization (PAHO), who is actually their Malaria Advisor, indicated that they are assisting with the following programs: malaria eradication, water supply, health services, fellowships, nutrition, medical texts, medical education, sanitary engineering education and dental education.

Most of these are rather minor projects and do not have full-time advisors in Nicaragua. However, the malaria eradication program is one of their major emphases and is closely related to the potentiality for a DEIDS project. PAHO participates by the contribution of one full-time advisor. UNICEF has assisted by the provision of insecticides and vehicles. AID has also participated by contribution of the funds for the purchase of commodities. Monetary contribution from these sources have now stopped and the Government of Nicaragua is undertaking SNEM in a limited area at its own expense.

The project that is called "health services" is actually still in the proposal stage. However, it will be tied to the health center system which AID has helped to build. Close coordination between this project and DEIDS would be essential.

2. UNICEF contributes to various training institutions and is supporting PRODUSAR, a cooperative venture involving several Ministries. This is briefly described in IV. C. below.

3. The Inter-American Development Bank recently granted a two million dollar loan to Nicaragua for the development of water systems in rural areas. The country is just tuning up for this program.

4. About ten years ago the World Bank loaned three million dollars for the development of water systems for Managua and some of the other cities.

5. The Inter-American Demographic Center, which has its headquarters in Chile, with a sub-center in Costa Rica, has been of some assistance to Nicaragua in demographic and family planning aspects.

6. AID was involved in several health projects about ten years ago. In recent years, loan funds have contributed towards the construction or reconstruction of 56 health centers.

In the past few years AID has also contributed to the development of the family planning program within the Ministry of Health. AID contributions have been heavy in proportion to the total health department budget. There has been some difficulty in persuading Nicaragua to pick up a greater share of the family planning budget.

C. Voluntary Organizations

1. Indigenous

The only voluntary health organization which seems to be very active in Nicaragua is the Red Cross Society. This organization, of course, is affiliated with the International Red Cross, but does raise some of its funds in the country. Part of the health budget is handed over to the Red Cross Society for its own functions. Possibly there could be better coordination between the use of Red Cross funds and those of the Ministry of Public Health.

2. Foreign

There are a number of missionary organizations which have health activities in Nicaragua.

a. In the city of Managua there is a Baptist hospital which has a good reputation. However, the cost of treatment there is quite high and their load of charity patients is relatively low. They sponsor an extension

program which seems to consist of one or more women volunteers from among the foreigners in Managua going to selected sites to distribute medicines. The volunteers are given a brief training course by the doctor in charge and then they more or less run the program on their own. Most of the time they travel by car, but one of their points of service has to be reached by air.

b. There are several Moravian hospitals on the east coast which have a good reputation for quality medical care. Here again, the cost is such that the poorest people have difficulty making much use of their services.

c. There is also a Catholic hospital in Managua, but reportedly its efficiency leaves something to be desired.

d. The Demographic Association of Nicaragua is just getting started. It has been supported in the tooling up phase by the IPPF and their budget for further expansion is under consideration at the present time. Currently their personnel consist of a full-time obstetrician-gynecologist as director and an educator. They are undertaking an experiment in radio promotion of family planning in a town near Managua and will use successful techniques in a nationwide promotional campaign. This campaign is being supported by the Pathfinder Fund..

D. Manpower and Womanpower

1. Nicaragua has had a medical school for years which has trained most of the physicians in that country. It is located in León, about an hour's drive from the capital. Last year fifty students were graduated. This year the class has been increased to eighty. The school is in the midst of an exciting change. A new five-year curriculum has been developed under the leadership of a dynamic dean. The chief innovation of this curriculum is that it switches teaching from a departmental orientation to a health problem orientation. Throughout the five years of their studies, the students will be continually exposed to the health problems of Nicaragua, the educational process being built around an understanding of these problems. For example, the problems of nutrition are approached by a group of teachers who integrate the physiological and biochemical aspects with the behavioral and cultural aspects. Most important, is that students visit families to measure nutritional intake and compare that to the usual intake for middle class families. Experiences such as these could produce physicians much more conscious of their role in community medicine than physicians educated under the past curriculum. The faculty is not completely unified in this

new approach but, in general, the dean gives assurance that he will be able to carry it through.

Currently, graduates of the Nicaraguan medical school are required to serve six months in rural health centers before receiving their degrees. This has not provided enough medical manpower for the existing health centers. However, the regulation has just been changed to increase the period to twelve months. This should provide enough coverage for most of the farthest out centers, with part-time older doctors serving the rest.

2. Other Health Personnel

The training of nurses and auxiliaries for various types of health activities is under control of the Ministry of Public Health.

a. Diploma nurses, who take a three year course, are trained at the large hospital in Managua. An attempt is being made to coordinate some of the training course with teaching done at the University, but so far such cooperation has been unofficial and on a private arrangement basis. Currently nurses are employed in Nicaragua as follows: Social Welfare Hospitals - 213, INSS - 122, Ministry of Health - 89.

b. Auxiliary nurses take a nine month training course. The syllabus is prepared by the Ministry, but the actual courses may be offered by quite

a number of hospitals, as well as by the Ministry. Nursing auxiliaries are employed as follows: Social Welfare Hospitals - 814, INSS - 463, MSP - 172.

c. In addition to the auxiliaries there are some practical nurses who are also employed by these institutions. They have no set course of training but have gained experience over the years and carry on much of the routine activities. Their numbers are as follows: Social Welfare Hospitals - 403, INSS - 20, MSP - 21.

d. Sanitary inspectors are trained by the Ministry in Managua. Originally the course took eighteen months but this was later reduced to a teaching period of six months, plus a period of practical experience of six months. However, the Ministry has been short on training funds and the only course recently held was a six week refresher course. The candidates for this were mostly those sanitary inspectors who had had training some time ago, but also included those who had been put on the payroll without formal training. The training section is not certain how soon additional sanitary inspectors would be trained. There are currently 243 sanitary inspectors employed by the MSP.

e. The Ministry of Public Health also trains laboratory auxiliaries, who are manning most of the health center laboratories. There are currently 158 laboratory auxiliaries employed, including the 24 which work for the malaria eradication program.

E. Budget of the Ministry of Public Health

The GON spends \$30,470,000 on health care. However, only \$6,300,000 is available to the Ministry, the rest being spent on maintaining hospital and outpatient systems of the INSS (\$8,450,000), JNAPS (\$8,300,000), the military (\$600,000) and on pension and social security payments of Ministry personnel (\$6,830,000).

Of the \$6,300,000 available to the MSP, \$2,400,000 is budgeted for capital expenses and \$1,300,000 goes to the Malaria Eradication Program. This leaves \$2,600,000 for operational budget for the generalized public health program of the country.

Using the \$6,300,000 figure, the per capita expenditure by the MSP is about \$3, but in reality the per capita expenditure on generalized health services is only \$1.30.

In terms of percentage of national budget, \$6,300,000 is 5.5% and \$2,600,000 is only 2.3%.

IV. DEIDS - Special Considerations and Criteria

A. Official Invitations from Host Country and AID -----

Although there had been some confusion in the cable traffic regarding the DEIDS team visit for reconnaissance and the Minister was not entirely clear as to the nature of DEIDS when we arrived, it became obvious that the Ministry of Public Health was interested in being considered for such a program. The Minister stated so on several occasions. The Population and Health Officer of AID, along with the Acting Director and Program Officer, joined in voicing their hope that Nicaragua would be chosen for a DEIDS project. This was further supported in long discussions with the Ambassador, who repeatedly mentioned his interest in seeing something done to improve the health system of Nicaragua. The Political Officer also stated that the atmosphere in the country seemed to be right for emphasis on the social services and that health would be a likely candidate for added assistance.

During our discussions with Nicaraguans and North Americans, we repeatedly emphasized the fact that the APHA contract would provide very little in the way of budget support to the Ministry. This concept of designing a program which could function on local resources was very well received.

B. AID Washington and WHO opinions.

1. The Development Resources Office of the Latin American Bureau in AID believes that Nicaragua would be a suitable country for a DEIDS project. It also feels that such a project might be useful in supporting the health sector analysis which is planned for Nicaragua. The Population Office has expressed some question regarding the appropriateness of a DEIDS project in Nicaragua, stating that it would be difficult to find an area in which there was a large enough population to satisfy the large-scale demonstration criterion. However, we found that such areas would be available. The Population Office also had some doubts regarding the willingness of Nicaragua to contribute funds towards a DEIDS project and about its willingness to make the results of the demonstration an integral part of its health delivery system. We found both of these doubts to be unfounded and believe that the government would contribute additional funds towards the project and that they would be willing to adopt its findings as part of their health delivery system in other areas.

2. In our discussions with the Pan American Health Organization personnel in Washington regarding possibilities in Latin America, Nicaragua was mentioned as a good possibility.

C. Previous health innovations

1. Pilot Projects:

a. PUMAR is a system of mobile medical clinics which has been operative in Nicaragua for the past eleven years. Currently there are eleven circuits, seven of which run by road and four of which are serviced by boats. We had the opportunity of talking with the doctor who is head of the Matagalpa Unit and who has been working on this project since its beginning. He is now in his third location,

Each circuit has approximately eleven points which the team visits twice a month. The team consists of a medical doctor, an auxiliary nurse, a driver, and one other assistant. Originally there were sanitary inspectors located at each of these points to carry on educational and action programs during the week. In a recent budget cut, it was necessary to reduce the number in half, so that one sanitarian now must cover two of the service points. As

the health center system of Nicaragua has been ready to establish additional health centers, some of the original PUMAR points have been converted into full-fledged health centers.

The PUMAR Medical Director makes a plan which is approved annually and includes a schedule for the communities which are to be visited and the targets which are to be met in each of the communities. These targets include such things as immunizations, wells, latrines, and sanitary inspections.

The team offers primary medical care at each of the centers whenever they are there. This care is not given free, two cordoba being charged for consultation and medicine is sold at cost. The consultation charge is turned over to the local committee for development work in that community. The doctor gave us an estimate of the cost that a patient would have to pay in order to be treated by the PUMAR team for a common ailment, in comparison with what it would cost at the Social Welfare Hospital or by private physicians. He calculated that the cost of treatment at PUMAR would be about one-fifth of the cost if treated at the hospital and one-tenth of what would be the total cost if treated by a private physician.

PUMAR is an example of an innovation which was undertaken several years ago by Nicaragua and which has been

successfully followed through. Many of the other countries which began a similar operation have discontinued it long ago. Therefore, the success of this program in Nicaragua is an indication that they will adapt innovations and are likely to be able to follow through on them.

b. On the Atlantic coast around Puerto Cabezas, an experiment has begun in coordination between PUMAR, the Moravian Hospital and the Wisconsin University project. Sharing of personnel, vehicles, equipment, and supplies has made it possible for resources to be spread more evenly and effectively. They are also in the process of training health representatives in the communities, which will further expand their limited health resources.

c. Another innovation involving the training of village leaders is being undertaken by the PUMAR unit which has the responsibility for the area along the road between Rama and Juigalpa, the region where the canal was to have been built. Some of the unit is attending a special training course in Israel to prepare them for training the village leaders.

d. PINAJE is a coordination plan developed by the MSP along with the Ministries of Agriculture and Education and the relief organizations that have food supplies.

Vehicles are shared and teams representing these agencies coordinate their visits to communities so as to meet and train leaders on a cooperative basis. We do not have information as to the numbers of places where this coordination is going on, but did hear of its effectiveness in the Departamento of Matagalpa.

e. PRODUSAR involves the Ministries of Public Health, Agriculture, and Education at the national level. An executive committee consists of persons representing education, nutrition, sanitation, agriculture, home economics, and health. One year was devoted to preparation and staffing and the program has been in actual operation about one year.

At the departamento level, the organization consists of one MD, one nurse, one agronomist, and one nutritionist. The medico is not full-time and the one nutritionist circulates in three departamentos. Three departamentos are now staffed and are operating in eight communities each. The team of field workers consists of one health educator, one auxiliary nurse, one nutrition educator and one sanitary inspector. There are four field teams actually working, two in one departamento. The agronomist on the departamento

level also works in the field. In addition to the PRODUSAR agronomist, there is another in each departamento working for the Ministry of Agriculture.

The project tries to develop local committees and work with them. Their training program for men concentrates on how to grow better and more nutritive crops. For women, the training is in the preparation of more nutritious foods for the family and in child care. The staff also encourages the villagers and their leadership to install latrines and potable water systems and to promote immunizations. One woman volunteer in each center weighs children and makes weight-for-age curves for all children. One man receives food supplies and distributes it twice each month on what is called "health day". On this day the doctor comes and gives services free, although 35 cents is charged for medicine.

Another aspect of the training is for adolescents, to whom vocational skills such as carpentry, shoe-repairing, and masonry are taught. In each departamento there is a one-year agricultural school for youth who want to concentrate on those skills.

The PRODUSAR program has been most effective in communities where Peace Corps Volunteers are resident and constantly working. The program may decide to assign Nicaraguan generalists to work in ways similar to the PCVs.

PRODUSAR is designed to develop an infrastructure that delivers integrated services, including health promotion and care, to rural people. If its success continues, it will be filling one of the serious gaps which is evident in the health service system, that of making services really accessible to those who live on farms at some distance from the population centers.

2. Auxiliaries are used by the Ministry of Public Health for various purposes, but for the most part they are not entrusted with primary medical care. Most of the time they are under the supervision of a physician and are not expected to work alone. However, in some instances when physicians are not available they undertake primary medical care. This is an indication that a program based upon primary medical care by auxiliaries might be successful. The home visitation program which they carry on is also a positive sign, although, for a program which is aimed at widespread coverage of the population, it would probably have to be done on a more systematic and thorough basis than is presently possible with the limited number of auxiliaries currently employed.

3. Involvement of non-allopathic health personnel. Curanderos have been operating throughout Nicaragua, chiefly in urban areas. With the extension of health services, there has been a reduction in their importance. (A newspaper article on a bulletin board of MSP had the headline - "Campaign to Combat Curanderos".)

Probably there are witchdoctors and curanderos in the eastern region among Indian groups but we were not told of them.

An attempt is being made in health centers to give training to indigenous midwives to improve cleanliness during childbirth.

4. Another innovation which has had success, with 80% support by AID funds, is the section within the MSP responsible for the family planning program.

There has been moderate success in family planning promotion and in service to clients, but the real question about viability after cessation of foreign assistance has not been answered.

Under the Director's office are:

(1) Education, Communication, and Information.

The Chief Health Educator has six others under her, all of whom have had primary school teachers' training and nine months of health education training. The educators usually give talks at general clinics in the morning, family planning clinics in the afternoon, and training courses at night.

(2) Social Investigation. Under the chief there are six social workers and five promotores. These workers assist by making home visits to improve acceptance and continuation rates.

(3) Cytology Laboratory. The medical pathologist is assisted by a cytologist, four cytotechnologists,

a secretary and one auxiliary. This group has the responsibility of processing the Pap test slides.

(4) Supervision. The responsibilities here are administration, personnel, filing, technical, and education. The Chief, who is a doctor, has a team of a nurse and an educator. This office is progressively training the personnel of MSP health centers and establishing and supervising clinics as training is accomplished.

(5) Statistics. Forms have been devised and a manual for their use has been prepared by this group. Some analysis of reports is being done, although not as rapidly or intensely as would be useful.

D. Readiness of the Ministry of Public Health for DEIDS

1. The Minister of Public Health met us on our first morning in Managua and arranged for us to talk with the heads of most of the divisions in the Ministry. Unfortunately, the first few days we were there coincided with the Medical Association meeting and most of the Ministry staff were attending those sessions. On our last day in Nicaragua the Minister talked with us for about thirty minutes. We are wondering if there is any significance to the fact that the Director General of Health and the doctor in charge of the rural health program were both absent from the city on that date. In any case, the Minister seemed eager to have a DEIDS project within his Ministry and stated so at the first session and at the debriefing.

2. The quality of personnel whom we met at headquarters and at the health centers seemed to be excellent. We did not have the opportunity of talking with great numbers of any one category, but the team agreed that practically all of those with whom we did talk were competent and likeable and were doing as well at their jobs as could be expected. Therefore, we could honestly state that we would enjoy working with people of the caliber which are now employed by the Ministry. Admittedly the quantity is

less than would be required to meet the DEIDS objective of full coverage, but with adequate support and training of the right sort, DEIDS would have a chance of succeeding.

3. The question of flexibility was not raised directly with the Minister, but because of the successes of some past innovations and the general situation in Nicaragua, we have reason to believe that flexibility would be adequate to give a DEIDS project a fair chance of success.

E. Extent and Potential for Involvement of other Government Departments and Agencies.

There is already substantial administrative interplay between field agencies of the Ministries of Agriculture and of Health designed to combine health advisory services for rural people along with agricultural advisory services. In one departamento [Esteli - 92 miles due north of the capital], in a mountainous area with a mixed corn and livestock production complex, one finds a very close working relationship between agricultural extension and health center personnel. One of the principal functions of agricultural extension in this district is to organize groups of rural people into clubs. Once organized, these clubs provide the mechanism for dissemination of information about improved farming

practices, nutrition, sanitation, child and maternal care. Much of the health effort of these combined programs is undertaken by women employees of the Ministry of Agriculture.

An interview with an official of the Banco Nacional in Chinandega Departamento provided an interesting insight into relations between farm credit and health. This official stated that all farmer borrowers of the Bank in this area suffered to some extent from ill-health in one form or another. Health becomes a general determinant of farm productivity. Farm credit is an indispensable component of agricultural production. Thus, it may be presumed that one of the considerations in making a farm loan would be the health constraint on credit-worthiness of potential borrowers. It was also revealing to learn that this Bank has eight agronomists at work in the district in contrast to one Ministry of Agriculture agronomist. Thus a significant organizational gain for a rural health service outreach might be obtained by relating the Bank's agronomists to the club work of the extension service.

Other aspects of inter-ministerial cooperation are described above (IV.C.1.d.& e.). Further exposition of the relationships between agriculture and health is included as Appendix D.

The development of coordination among the MSP, INSS and JNAPS has great potential for further improvement in health services (See III.A.).

F. Institutional Bases

1. The institution which would be responsible for the administration of a DEIDS project in Nicaragua would be the Ministry of Public Health. Its organization and its relationship with the INSS and JNAPS programs is described above (II.A).

2. For evaluation and research capacity, it would probably be possible to involve an organization called INCAE, the Central American Institute of Business Administration. It is a regional center for preparation of persons in management and administration and receives technical assistance from the Harvard School of Business Administration. We were not able to discuss this matter with anyone from that Institution, but the persons who told us about it indicated that they would have the competence and interest to assist in evaluation if a DEIDS project is located in Nicaragua.

3. Responsibilities for training are already pretty well delineated (See II.D). Special kinds of training could be carried out by other Institutions, such as INCAE and the Demographic Association.

G. Current or Imminent DEIDS-like projects for Nicaragua have not come to our attention.

Appendix A

Itinerary

November 29, 1972:

The whole team arrived together just before noon. Our afternoon appointments were with AID and the Ambassador. In the evening we met the Wisconsin resident representative.

November 30:

The Minister of Health and members of his staff briefed us on Ministry of Health activities and programs. More details were obtained from certain division heads later in the day and on subsequent days. One team member attended the morning session of the Nicaragua Medical Association. The rest of our team visited the Institute for Development of Nicaragua (INDE), the Foundation for Development of Nicaragua (FUNDE), and the Demographic Association of Nicaragua. In the afternoon we talked with the Acting Representative for PAHO, chiefly about malaria eradication, and with the MOH staff.

December 1:

In the morning we visited the Directors of the Nicaraguan Social Security Institute (INSS) and the General Hospital. We had a working lunch with two doctors particularly interested in rural health development. In the afternoon our appointments were with the Director of Family Planning and with the Political Officer of the Embassy.

December 2:

Staff of the INSS took us to see a newly constructed hospital near Managua and we visited the health center at San Marcos.

December 4 and 5:

Our field trip took us to the Departamentos of Matagalpa, Esteli, León, and Chinandega. We visited health centers, the medical school and a family planning clinic.

December 6:

In the morning we met with the Minister for debriefing, followed by discussions with other individuals on his staff. The afternoon was spent in debriefing with AID and Embassy.

Contact List

1. Dr. Fernando Valle López, Minister of Health
2. Dr. Carlos H. Canales, Director-General of Health
3. Dr. José Antonio Cantón, Director of Health Recuperation and PUMAR
4. Dr. Justo Pastor Zamora, Director Administrative Services
5. Dr. Orontes Avilés, Director of Health Planning and Evaluation
6. Dr. Francisco Gutiérrez Alfaro, Director, MSP Family Planning Program
7. Miss Olga María Vindel, Chief, Department of Nurses
8. Mrs. Francisca López de Carrillo, Chief, Health Education Department
9. Lic. William Baez Sacasa, Executive Secretary, Foundation for Development of Nicaragua
10. Dr. Roger Quant Pallavicini, Executive Secretary, Institute for Development of Nicaragua
11. Dr. Emilio Bandes Wagui, Director, Demographic Association of Nicaragua
12. Mrs. Silvia McEwan, Administrator, Demographic Association of Nicaragua
13. Dr. Cheng Hua Chuang, Acting Representative, PAHO
14. Lic. Félix Hernández Gordillo, Director General, Nicaraguan Social Security Institute
15. Dr. Abraham Rossman, Administrative Director, Nicaraguan Social Security Institute
16. José Ivan Pérez, Chief of FP, Nicaraguan Social Security Institute

17. Dr. Carlos Jirón, Director, General Hospital
18. Dr. Roberto Calderón, Chief, X-Ray Dept., General Hospital
19. Dr. Homer Venters, Pediatric Dept., General Hospital
20. Dr. Fernando Pérez Ramirez, PUMAR, Matagalpa Region
21. Dr. Augusto Flores Lovo, Director, Regional Health Center and Director of San Vicente Hospital, Matagalpa
22. Dr. Marcos Pereira Madriz, Chief, Health Center of Malpaisillo
23. Lic. Aminto H. Rodriguez, Nutritionist, Division of Nutrition, Ministry of P.H.
24. Dr. José Tomás Campos Ochomogo, Dean, School of Medicine, León
25. Dr. Carolyn McKay, Coordinator, Wisconsin program, Puerto Cabezas
26. Dr. Carlos Amaya, Director, Division of Laboratories and Training, MSP
27. Inj. Donald Reyes G., Ajente de Extencion Agro.
28. Able Abad Martinez, Gerente, Banco Nacionale de Nicaragua, Chinandega
29. Dr. Montez, Instituto Agraria de Nicaragua
30. Auxiliaries at San Marcos, Matagalpa, Malpaisillo, and Chinandega
31. The Honorable Sheldon, Ambassador
32. Mr. Cheek, Political Officer, Embassy
33. Mr. Ernest J. Barbour, Acting Director, USAID

34. Mr. Allen Goldstein, Program Officer, USAID
35. Mr. John Sanbrailo, Capital Development Officer, USAID
36. Mr. Albert Grego, Public Health Advisor, Population
Officer, USAID
37. Mr. McLendon, Rural Development
38. Mr. Maurice Owen Tom, Assistant Population Officer

Appendix C

Political and Economic Stability

From our discussion with the Ambassador, his Political Officer, and AID personnel we learned several facts and drew certain conclusions which may not be suitable for the body of the report, but are important to consider when judging feasibility of a DEIDS project in Nicaragua.

1. Nicaragua is technically not a military dictatorship. It is a republic with legislative, judicial, and administrative organs. However, the dominant political party is controlled by the Somoza family, particularly General Anastasio Somoza Debayle. He has the political and economic power to enforce his decisions and no major decisions are made without his approval. His party machinery was compared to the one by which Daly controlled Chicago a few years back. There is every evidence to indicate that this control and stability will continue for the lifetime of the General.

2. The economy of the country is extremely stable. The conversion rate to and from dollars has been C7 to \$1 for years. Imports and exports are usually well balanced, except in drought years. Unfortunately, Nicaragua has no major natural resources other than agriculture.

3, General Somoza seems to be at the point of considering putting more resources into social welfare projects. So far transportation, communications and electrification have taken major portions of revenue. One guess was that the General would like to reserve the major expansion of a health program until after he is elected President again in September 1974,

4, The Ambassador is enthusiastic about the possibility of improving health services. He has direct and frequent access to the General. He is confident that a \$200,000 annual budget increase for the Ministry of Health could be negotiated. This investment should produce some findings on which a nationwide health delivery system could be based after the next election.

5, AID and the Embassy understand that the foreign assistance would be primarily technical. They are interested in supporting a system which is designed to function within the resources of the country,

6, The INSS is powerfully entrenched. It serves as a patronage mechanism and employs an excessive number of people, including doctors. They are well paid,

but part of their pay is automatically sent to the "party" and they are dunned for additional contributions from time to time. Therefore, it would probably not be possible to promote a merger of the INSS medical care system with the other elements of the health services.

8. There is a Commission already established representing all official elements of the health and medical care services. Some progress is being made at coordination. Probably DEIDS negotiations and planning involve this Commission. The Minister of Health is chairman of that Commission.

Appendix D

DEIDS Project Demonstration Area Comparisons
within Nicaragua

The MSP had not proceeded far enough in its thinking about a DEIDS project to identify a demonstration area. Our discussions and brief field trips did not provide sufficient information for us to recommend a particular area. Part of the difficulty arises from differing definitions for rural and urban population. The sources at hand are old and give conflicting information. For instance, the Shell road map shows only 7 cities with a population of 10,000 or more, and 7 others with between 5 and 10,000. However, there are 126 areas designated as "municipios". One source gives the population of the city of Jinotega as 74,245 and the same source says there are 98,312 people in the Departamento of Jinotega with an area of 9,000 sq. km. The road map classifies the town of Jinotega as between 5 and 10,000. We did not get there to see for ourselves. We did go to Matagalpa, where we were told the town contained about 20,000 people. This seemed a reasonable guess from driving through it. But other sources state that the urban area contains 75,000. These conflicting figures make a judgment as to rural-urban proportions difficult.

Here are our comparisons of the advantages and disadvantages of several possible areas.

1. To the south of Managua is a region composed of four departamentos with a population of about 270,000, in which there are urban areas containing about 100,000 people. The farming area is mostly occupied by coffee plantations and cattle ranches, but has some small-scale land holders. However, this is the area in which PRODUSAR has begun operations and therefore should probably not be considered as a potential DEIDS area.

2. The Atlantic and riverine region covers more than half of the area of Nicaragua, but contains only 125,000 people. All of them can be considered rural. Dr. Wallace has made his case for considering this region. The case was supported by the local Wisconsin people and by the Director of Rural Health Programs. Our team was unable to visit the area because of infrequent air schedules and the shortage of time. Furthermore, the likelihood of this area's being selected seemed small. Not only is the population base too small, but transportation and supervisory problems would be so great that a DEIDS demonstration would have extreme difficulty in achieving its objectives. Furthermore, the area is not geographically, economically, or ethnically

representative of Nicaragua. However, if DEIDS does go to Nicaragua, the planning team should probably visit that region before the decision on area is reached. Besides, they would learn from programs already operating there.

3. We visited Matagalpa as representative of the central hilly area. In this Departamento the farms are mostly small and individually owned, although there are some cattle ranches and coffee plantations. The western part of the Departamento is well serviced by roads. It has nine health centers and two hospitals. The total population is in the neighborhood of 200,000, but it could be combined with the departamento to the north to raise its population base to over 280,000. That area is similar, but larger and less developed. Or it might be enlarged by attaching the Departamento of León, which is ecologically and economically quite different. Matagalpa should be a suitable demonstration area.

4. León-Chinandega was also suggested as a possible area. These departamentos contain about 375,000 people of which 40% live in urban areas. The land is mostly coastal plane and large-scale cotton growing predominates, employing large numbers of landless laborers.

The medical school is in León and two cities contain a goodly number of doctors. There are at least five factors which would need to be considered before this area could be agreed upon:

- a. The large proportion of urban people
- b. The predominance of landless laborers in the rural population, with a high degree of migrancy
- c. An opinion expressed by one health official that the medical men in the cities would try to block the use of auxiliaries for primary medical care, seeing this as a threat to their livelihood.
- d. The presence of some anti-U.S. feeling in the student body. This derives partly from unfortunate publication of impressions by a previous Ship HOPE technician. It might make it difficult for a team of "gringos" to live and work there.
- e. The area is known as a "pistol packing" area, where violence is common.

In conclusion, it would seem that Matagalpa Departamento would be a suitable demonstration area. It might be feasible to combine it with the León Departamento to make it large enough and more representative of the country. However, this would mean combining departamentos from two of the health regions as currently demarcated.

Appendix E

Possible Shape of DEIDS in Nicaragua

I. The only area we studied in detail was the Departamento of Matagalpa. It has an area of about 6,800 square kilometers -- 140 by 50 km. -- and contains about 200,000 people, of whom 70,000 are in the Municipality, and of those, 20,000 are in the town.

It has a Social Welfare Hospital of 300 beds with an expenditure of about \$260,000 annually.

There are nine health centers and six PUMAR points in the eastern two-thirds, which has some roads. We don't know the proportion of population that has access to these services.

There is also a malaria eradication program with its volunteer collaborators and auxiliaries. These might be utilized in the program if the consolidation phase is reached.

There is coordination between Departamento staff of Agriculture, Education, and Health, with joint activities at eight places. Clubs have been organized.

II. In order to aim at meeting the coverage requirement of DEIDS in Matagalpa Departamento we guess that the following structure needs to be developed:

<u>Type</u>	<u>Ratio</u>	<u>Number Required</u>		<u>Additional Cost Estimate (in \$US)</u>	
		<u>Matagalpa</u>	<u>Nicaragua</u> (rural pop.)	<u>Matagalpa</u>	<u>Nicaragua</u> (rural pop.)
Volunteers (or possibly on a small retainer - \$20/mo.)	1/1000	200	1,600	\$ 48,000	\$ 384,000
Organizers (\$100/mo.)	1/8,000	25	200	30,000	240,000
Health Centers	1/25,000	8[9]*	64[121]		
Supervisory and Training Team:	1/400,000	1[1]	4[11]	24,000**	96,000**
PH Physician \$1,000					
PH Nurse 400					
Health Educ. 300					
Sanitarian 300					
Operations Research - a team of 2 or 3 professionals - \$1500		1	2	<u>18,000</u>	<u>36,000</u>
				\$ 120,000	\$ 756,000

*Bracketed figures indicate the number already existing.

**Part of this might be met by current PUMAR salaries.

III. Data gathering would include:

- A. In family registers, kept by the volunteers with the organizers' help, would be a running record of family members by age and sex, immunization status of children, pregnancy care of women, and family planning acceptance and possibly other factors.
- B. Service statistics would be obtained from all full-time employees, clinics, and centers.
- C. Special surveys and investigations would be conducted to help solve specific problems.

IV. The DEIDS foreign personnel would probably consist of:

- A. Public Health Physician - full-time
- B. Operations Research Expert - full-time
- C. Health Educator - first year, at least
- D. Public Health Nurse - full-time
- E. Sanitarian, for several months each year

- V. The Project could either include at the beginning, or expand within two or three years to include an adjacent Departamento. (See Appendix C)

Appendix F

Observations on Socio-economic Aspects of Rural Nicaragua

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1. The rural characteristics of Nicaragua are not extraordinary. In terms of population concentration, income, employment, welfare, housing, population growth, nutritional levels and health one finds no startling statistics distinguishing the rural people of Nicaragua from those of other LDCs of Central and South America or of LDCs on other continents. When such factors as low labor productivity, high incidence of ill health, high infant mortality and birth rates, inadequate nutrition, illiteracy rate, low income, poor sanitation and high unemployment are combined, the index of rural welfare in Nicaragua does not seem markedly different from rural welfare norms of the LDCs of Central and South America. It is this very normalcy of the welfare aspect of Nicaraguan rural life that makes the country interesting. Whatever programmatic effects can be achieved in raising the health and welfare standards of Nicaragua may have very extensive application throughout the entire region.

2. Approximately 55% of Nicaragua's 2.2 million people are classified as rural, that is living in villages of less than 1000. The Pacific Zone contains about 56% and the Northern and Central Zone has 37% of the national population.

These zones possess better natural resources and climatic conditions and are more economically and socially developed. In contrast, the sparsely populated, less well-endowed Eastern or Atlantic zone of the country is relatively underdeveloped economically and in terms of social and physical infrastructure. Some effort is underway to develop the Atlantic Zone, but the prospects are not encouraging. Its present population is about 125,000 and its economy is primarily small-scale subsistence farming and fishery.

3. Agriculture (defined to include livestock) in the Pacific and Central Zones accounts for about 35% of the Nicaraguan gross domestic product and is fundamental to the entire Nicaraguan economy. Agriculture directly provides economic support for over half the population. Agricultural commodities, primarily cotton, coffee, and beef, account for over 75% of Nicaragua's all-important export trade. In addition, over 60% of Nicaragua's manufacturing output involves agricultural processing. It is therefore important to recognize that the economic base of Nicaragua is largely agricultural productivity.

4. The extremely vulnerable condition of Nicaragua's economy, due to its critical dependence on agriculture, means that improvement in the socio-economic conditions of the rural sector is an indispensable condition for national economic development. To a very large degree this productivity rests on the vigor and well-being of rural people in the Pacific and Northern and Central Zones.

If the health, and in consequence the productivity, of the rural sector were to be increased 50% above prevailing levels, the multiplier effects in the other sectors would result in significant national economic gains, provided the supporting services of marketing, transport, storage and communication were correspondingly improved.

5. There seems to be general agreement that rural health standards throughout Nicaragua are low. Poor sanitation with its consequent disease, due primarily to a lack of protein intake and respiratory infections, were generally recognized as fundamental causes of widespread rural ill health.

6. The critical target for rural welfare and health is some 220,000 families. Of this group, 70% receive a maximum family income of US\$300. per anum. A large but unmeasured fraction of this income is from subsistence

agricultural crops grown by small producers. These workers are only seasonally employed, primarily in the cultivation and harvesting of coffee and cotton. Absenteeism is prevalent and this may be due in part to lack of energy and health.

7. Nicaragua, in common with some other Central American countries, has a relatively low man-land ratio. Of its 31.5 million acre land area, nearly 70% is suitable for some form of agriculture, yet only 30% is presently utilized. Even in the more densely populated western portion of the country, the proportion of arable land under cultivation did not exceed 50%. In only a few scattered areas did it exceed 75%. One conclusion that might follow from the favorable man-land ratio would be that the land resource base does not impose a constraint on increasing population nor on production. The constraints, which appear to be effective, have mainly to do with the socio-economic characteristics of rural families.

8. Nicaragua, in common with some other Latin American countries, attempts to solve problems of rural distress in settled areas by relocating distressed people in colonies in underdeveloped portions of the country. For poor countries

this is unsound because it involves dispersing even more widely the country's limited reservoir of technical skills and of undertaking expensive outlays for infrastructure with no pay-off assurance. Relocation and colonization schemes are expensive and the record of failure is high. For this reason, the present Nicaraguan policy, of seeking to colonize the large Atlantic Zone might be reconsidered.

It would seem more logical to deal with the problems of rural people where they are. The settlement pattern of Nicaragua and all other countries has to be considered as a geographic response to higher economic opportunity in the western portion of the country. Historically, human beings have settled those areas of greatest promise. The basic reason for the low population in the Atlantic Zone is that people simply don't want to live there. Consequently, efforts to force colonization are almost sure to be unsuccessful and expensive. One very practical aspect is the dispersion to that area of scarce reserves of medical and health personnel.

9. The combination of poverty, ignorance and the conditions of rural life account for Nicaragua's low rural health standards. While the country could support a larger rural population, the socio-economic condition of rural families argues for a substantially reduced birth rate.

Rural families cannot afford the costs of additional children and women of child-bearing age and infants have to bear a disproportionately heavy health liability. Family-planning becomes a factor primarily based on welfare considerations of the health of rural families rather than on national economic policy models of countries like India with highly adverse man-land ratios.

10. A short visit to the rural areas of Nicaragua does not provide sufficient grounds to suggest answers to the very evident socio-economic problems of rural people. But it is possible to detect some aspects of the Nicaraguan rural scene that are impressive. First, perhaps, is the mixture of primitive conditions of rural life with the obviously high level of sophistication and education among people even in relatively small rural-urban centers located in rural areas. Second is the apparently widespread knowledge among both rural and urban officials of the poor rural health condition along with knowledge of cause and prevention. Third, there is awareness that low productivity, poor farm methods and poverty are linked to rural health conditions.

11. Another intriguing aspect of rural Nicaragua is the fairly extensive framework of rural health organization and administration. What is impressive here is the substantial administrative interplay between field agencies of the Ministry of Agriculture and of Health designed to maximize health advisory services for rural people along with agricultural advisory services. In the Departamento of Esteli, 92 miles due north of the capital, in a hilly area with a mixed corn and livestock production complex, one finds a very close working relation between agricultural extension and health center personnel. One of the principal functions of agricultural extension people in this district is to organize groups of rural people into clubs. Once organized, these clubs provide the mechanism for dissemination of information about improved farming practices, nutrition, sanitation, child and maternal care. Much of the health effort of these combined programs is undertaken by women employees of the Ministry of Agriculture. The public served consisted of ten "clubs" of about 25 families each. One could only guess at the outreach effect of these "clubs" on non-club members. However, starting from this base, it would be possible, in theory at least, to use

each club as a nucleus for organizing further clubs. Nor would it be too theoretical to envision short-course training programs preparing club members to undertake actual program activities on a volunteer or on a low pay reimbursable basis. This kind of operation would economize on the time and increase the efficiency of professionally trained workers. What is encouraging about the Estelli situation, if it is at all typical, is the existence now of the basic framework for an extended health delivery system.

12. An interview with an official of the Banco Nacional in Chinandega provided an interesting insight into relations between farm credit and health. This official stated that all farmer borrowers of his Bank suffered to some extent from ill-health. Thus it may be presumed that one of the considerations in making a farm loan would be the health constraint on credit-worthiness of potential borrowers. Since farm credit is an indispensable component of agricultural production, health becomes a general determinant of farm productivity. It was also revealing that this bank has eight agronomists at work in the area in contrast to one Ministry of Agriculture agronomist. Thus a

significant organizational gain for rural health service outreach might be obtained by relating the bank's agronomists to the club work of the extension service.

13. Finally, while one is impressed by the number of organizations engaged in one aspect or another of rural health in Nicaragua, one might also question the degree of coordination among these separate entities. Multiplicity of health organizations does not necessarily lead to unified outreach services and may cause duplication of effort and dispersion of scarce professional skills. The central administrative problem is to design a comprehensive health delivery system under unified management that blankets the entire rural population.