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FROM - MANAGUA

DATE SENT
September 11, 1970

SUBJECT - Noncapital Project Paper (PROP)

REFERENCE -

Country: NICARAGUA

Project Number: 524-11-110-067

Submission Date: September 1970

Original Revision 1

Project Title: IRRIGATION DEVELOPMENT

U.S. Obligation Span: FY 1969 through FY 1972

Physical Implementation Span: FY 1969 through FY 1973

Gross Life of Project Financial Requirements:

U.S. Dollars **\$500,000**

Cooperating Country Cash Contribution **\$300,000 (in-kind)**

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I. Summary Description

In 1967, of an estimated 1,814,345 hectares harvested in Nicaragua, only 29,112 hectares were irrigated, or approximately 1.6% of the harvested area. Of the area irrigated, 9,220 hectares were devoted to sugar cane production, 9,106 to rice, 6,828 to pasture, 2,002 to bananas, 1,361 to plantain, and 596 to tobacco. In the more important crop producing areas of the country, particularly the Pacific coastal area and the north central area, average annual rainfall varies from about 40 inches per year to about 80 inches per year, by far the greater part of which falls in the four months of June, July, September, and October. In all of the farming area, the extended dry season during the period November to May seriously limits the production of perennial crops and prevents the production of annuals without the use of irrigation. Supplementary irrigation for crops grown during the May to November period, can greatly increase yields during the extended dry periods. The judicious use of irrigation water will permit time phasing of crop production and multiple cropping which is not feasible when depending exclusively upon natural rainfall for soil moisture.

The Ministry of Agriculture and Livestock (MAG) will, with assistance provided by USAID/Nicaragua, combine the required resources of technical assistance, training facilities, equipment and supplies, irrigation sites, and farmer cooperation, so as to carry out a pilot program to accumulate, evaluate, and disseminate information necessary for the establishment of a national program of irrigation development. A primary objective of this project is to improve agriculture technology and cultural practices for the purpose of increasing agricultural yields and diversifying production within the overall program of improving the general welfare of the Nicaraguan rural society through a series of rural development projects. (Mission programs that contribute to this general goal include Agricultural Production and Diversification, Agricultural Institutional Development, Institutional Coop Development and the Basic Crops Loan.)

In this project, technical assistance will be financed by USAID and provided through contracts between MAG and one or more U.S. institutions or companies that have competence to provide such services. The contract technical staff will include an agriculturist and an irrigationist who will be full-time resident technicians, plus part-time consultants as required. This technical input will be further augmented by the contractor's home office supervisory personnel. A 14 hectare field research station will be provided by the Ministry and operated exclusively by the project personnel to carry out research and observation planting to determine practical cropping systems, rotational patterns, and irrigation techniques and to provide a demonstration site for functional irrigation programs in

Nicaragua. In addition, four private sites have been selected in the Pacific coastal area and agreements have been made with farm cooperators whereby the farm operators agree to carry out recommendations of the technical staff responsible for the project. For each site, approximately 14 hectares each, the technical staff will prepare farm plans that will entail a system of complete irrigation during the six-month dry season and supplemental irrigation during the remainder of the year. This will enable the technicians and the cooperator-farmers to determine the economics of production and comparative returns for crops produced. Project emphasis on the field research station will be on the production of such non-traditional crops as peanuts, safflower, okra and castor and on the development of cropping and management practices on other feed and food crops.

The Ministry of Agriculture coordinates the project through its Division of Specialized Services, located at the MAG research station at La Calera, in the Pacific coast region. Four university level technicians have been assigned to the project, plus a complete supporting staff necessary for a field experiment station. This division is responsible, with the assistance provided by the contract staff, for the development and execution of the irrigation development project. The Ministry is responsible for offices, transportation, administrative support facilities, and an operational budget to carry out the project's objectives. Short-term assistance provided by the contractor, will concentrate on the economics of production, farmer-cooperator operations, program planning, and the coordination of the activities with all GON and related agencies. Coordinated activities will be conducted with the National Bank of Nicaragua's 15,000 hectare commercial irrigation project and with the Louisiana State University's agricultural contract team, especially in the area of concentrated local and export marketing research.

An irrigation Coordinating Committee will be established consisting of one representative each of the Ministry of Agriculture, the National Bank, the U.S.-funded Contractor TAHAL and the USAID to insure that there is adequate coordination of the irrigation programs being carried out by the BNN and the MAG and to evaluate the progress of work being done. In order to further ensure coordination at the national level the project coordinating committee will work closely with the Technical Advisory Group established by decree to assist the National Coordinating Committee in the evaluation and establishment of national priorities on the development and use of soil and water resources.

II. Setting

Much of Nicaragua's agricultural area receives rainfall only during part of the year. The Pacific coastal area and part of the north central area receive no significant rainfall during an annual six-month period. This area is characterized

by having good soils, topography and climatic conditions, other than annual rainfall distribution, for the production of many agricultural crops. There has been some activity in the irrigation of sugar cane, rice, bananas, pastures, and tobacco, and there is an increasing awareness of the contribution that irrigation may make to increase and diversify crop production. Much more investigation must be done, and data based on controlled operations must be collected and evaluated before extensive, reliable, and meaningful recommendations can be made. Then too, large numbers of farmers must be trained in the use of irrigation water, as well as in proper timing of farm activities during the wet and dry seasons.

Recommendations for irrigation investigations of the Pacific zone started as early as 1949 when at the request of the Government of Nicaragua, a FAO team made a study of the need for irrigated farming. A similar recommendation was also contained in the report of the IBERD team which studied the overall economic situation in 1952. In 1954, the Instituto de Fomento Nacional (INFONAC) started some work on technical studies for irrigation development, ^{and} provided some financial assistance for development of small projects of ground water development for individual farms. The FAO sent an irrigation specialist to Nicaragua in 1956 to assist the GON in further studies on irrigation development possibilities. This specialist worked for several years with INFONAC, primarily in providing technical guidance to the implementation of individual farm development by wells or small diversions.

There has never been an overall, comprehensive project to gather and compile all facets of information bearing on irrigation in all its aspects, including controlled demonstration activities. In July 1966, a request was made for an irrigation investigation and possible development project by the GON agricultural coordinating committee. As a result, USAID contracted with the Development and Resources Corporation for a study of the irrigation potential of the Pacific zone and identification of irrigation projects. This study was completed and a report submitted in October, 1966. As an outgrowth of this study and previous activities and recommendations, the Government of Nicaragua and USAID agreed that plans should be established for a demonstration program leading to the development of irrigation. To date, the GON has reacted to this growing awareness of the increasing need for irrigation programs with limited studies, surveys, and development projects, but it does not yet have the competency nor the resources necessary for the development of an effective water utilization program. This project will pull together information developed by the Natural Resources Inventory and other governmental related agencies, and will serve as an implementing arm of the Ministry of Agriculture in putting water to use in a profitable manner.

III. Strategy

The strategy of this project is to develop and foster the awareness of the need for a national irrigation utilization program and management agency by demonstrating at the farm level, the higher returns resulting from proper land and irrigation techniques and by developing data on specific crops and their marketability, and their relation to production through irrigation. This project will expand and re-inforce the coordinating efforts already undertaken among several institutions dealing with irrigation potentials by making available, in succinct form, the results of irrigation possibilities in Nicaragua and by providing the Ministry of Agriculture and the BNN sufficient capacity to develop and promote wide-scale irrigation programs.

IV. Planned Targets, Results, and Outputs

It is the intent of this project to provide an effective means of demonstrating the appropriate use of irrigation on annual and perennial crops, especially during the six-month dry season, at four cooperator farms and at a GON experiment-demonstration station in the north Pacific coast zone of Nicaragua. It is likewise intended that this demonstration-experimentation will allow for the development of various cropping systems and rotational plans for Nicaraguan farmers which fit into the rainy and the irrigated seasons in such a way that land does not lay fallow or that production yields are such that no profit is realized by farm owners and operators.

From the inputs of USAID/Nicaragua, the following outputs are expected:

1. The Ministry of Agriculture will enter into a contract with a U.S. firm or institution for the services of two specialists in irrigation plus other part-time specialists.
2. The Ministry will establish an irrigation section and designate a full-time professional staff to the project.
3. An experiment-demonstration station will be established, four demonstration farms will be selected and prepared for irrigation and cropping plans will be developed for each farm. The four cooperator-farmers will be expected to contribute up to the equivalent of \$30,000 per year in the form of land and production costs, which should be recovered by the sale of the agricultural products over a period of time. Each of the five irrigated sites will contain approximately 14 hectares, or 34 acres.

4. Assistance will be rendered on the demonstration station and to the cooperator-farmers for a period of three to five years. Additional technical assistance will be provided to additional selected farmer-cooperators during the life of the project.
5. At the end of each full crop year, an analysis and evaluation of the results obtained will be made for each site. These results will include a coordinated report on the marketing of the products.
6. Based on the results obtained, decisions will be made on changes in cropping patterns and/or farming operations, and on whether to modify or discontinue any particular cooperator arrangement.
7. Nicaraguan specialists will be given on-the-job training in modern irrigation farming practices, with the objective of being able to perform, as well as direct, such operations.
8. Suggestions will be made for the initiation of a national program on water rights, water regulations, water quality standards, and the development of a national irrigation program.
9. The Ministry of Agriculture, in cooperation with the National Bank of Nicaragua will implement an irrigation program, which will assist the country in achieving greater crop diversification and higher crop production.

From the outputs derived above, it is hypothesized that the following results will occur, as planned within the goals of the Mission's overall agriculture sector goals:

- A. Proper irrigation practices and principles will have been effectively demonstrated on the fertile soils of the Pacific coast of Nicaragua.
The demonstration of irrigation practices, if successful, could stimulate the use of irrigation on more than 80,000 acres of land on Nicaragua's Pacific coast, thus increasing the use of land during the dry season, and consequently increasing employment and food production. The potential impact could be limited by external factors, such as lack of proper financing for irrigation, depression of world market prices, development of local markets, storage facilities, etc.
- B. A statistical determination will have been made on the economics of irrigation in the Nicaraguan dry season, and the most appropriate combinations of crops that can be grown on the same land on a year-round basis.

With the exception of a few crops grown on a large scale, mainly for export, (sugar cane, cotton, bananas, tobacco), there is little data available on the economics of production of crops grown under irrigation in Nicaragua. This data would be highly valuable for banking institutions for agricultural financing purposes, and for farmers in determining alternate cropping plans, especially during the "off-seasons".

- C. A collection of data will have been presented on basic water requirements, crop varieties, marketing feasibilities, and cultural practices needed for effective irrigated crop production in Nicaragua.

Knowledge of the above, including the limiting factors of excessive water, wind, disease, insect pests, etc., would benefit each individual farmer in making management decisions which lead to higher yields, and greater profits, thus improving the standard of life in the Nicaraguan rural sector.

- D. Ministry of Agriculture technicians and cooperator-farmers will have been effectively trained in modern irrigation practices and in the production of new potential crops.

The training of Nicaraguan technicians and cooperator-farmers, by direct experience and through demonstration methods, in irrigation practices as applied to a variety of crops is essential both to the success of the project and to the overall goal of higher production yields and greater crop diversification.

The success of this project will be measured by the extent to which the information and technical knowledge engendered by it will be put into practice on a national scale, after the project's termination. The USAID has attempted to insure that the Ministry's efforts will in fact be continued in this project, by establishing conditions for Ministry and Contractor support to this project, as follows:

- (1) The Ministry will provide four university-level technicians as counterparts to the project;
- (2) Participant training, will be an essential part of the project;
- (3) The Contractor will prepare short-term training courses for Ministry technical staff;
- (4) Establishment of the irrigation Coordinating Committee discussed above, and
- (5) Preparation of monthly, special and final reports by the Contractor in Spanish that will be of value to the Ministry and other GON agencies.

V. Course of Action

In FY 1967 USAID/Nicaragua provided funding in the amount of \$250,000 for technical assistance to the Ministry of Agriculture in carrying out a program of irrigation development. In FY 1970, another \$30,000 was provided to the Ministry for the continuation of the irrigation project. In accordance with the provisions of Project Agreement 67-7 and PIO/T 524-057-3-70094, and Project Agreement 70-14 and PIO/T 524-067-3-00031, the Ministry of Agriculture entered into a contract with a U.S. firm, UNICONSULT, to provide the technical services for carrying out a demonstration irrigation project to be known as "Project Adelante." Through Project Agreement 70-21 and subsequent agreements, USAID/Nicaragua proposes to provide additional funding for technical assistance in irrigation development by permitting the Ministry of Agriculture to enter into a contract with a new U.S. institution or consulting firm. This funding will provide for up to five years of participant training in irrigation development. The Ministry will provide, through normal budgetary procedures, adequate budgetary support for staffing and administration as is needed to effectively carry out the project's objectives.

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NONCAPITAL PROJECT FUNDING (OBLIGATIONS IN \$000)

PROP DATE: Sept. 1970
Revision 1
Project No. 524-11-120-067

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Fiscal Years	Ap	L/G	Total	<u>Personnel Serv.</u> AID - FASA - CONTR.	<u>Participants</u> US Agen - CONTR.	<u>Commodities</u> Direct - CONTR. US Agen	<u>Other Costs</u> Direct - CONTR. US Agen
Prior through Act. FY 1970			280	----- 230	-----	30 -----	20 -----
Opert. FY 1971			110	----- 110	-----	-----	-----
Budget FY 1972			110	----- 110	-----	-----	-----
Total Life			500	----- 450	-----	30 -----	20 -----

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TO - MANAGUA AIDTO A 80

FROM - AID/Washington

SUBJECT - Irritation Development

REFERENCE - 524-11-10-067

DATE SENT

10/7/70

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1. AID/W Evaluation Panel reviewed this PROP on September 28, 1970. It is approved for the life of the project (through FY 1972) with the following conditions:

2. The purpose of this project is stated on Page 7 "the success of this project will be measured by the extent to which the information and technical knowledge engendered by it will be put into practice on a national scale."

3. It is clear that broad scale irrigation will require an overall water resources program and financing. The outputs of this project, however, appear to be:

- a. A successful demonstration,
- b. Training of appropriate staff,
- c. Establishment of a national irrigation coordinating group,
- d. Economic studies of crops and water utilization.

PAGE 1 OF 2 PAGES

DRAFTED BY Arthur M. Hughes	OFFICE LA/OPNS	PHONE NO. 29882	DATE EX 10/1/70	APPROVED BY: LA/DP: Jack T. Keller
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LA/DR: Mr. Walker LA/DP: Miss Schraud LA/CEN: Mr. Canaur

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4. The difficulty with the project as it is now structured is that the outputs of the project will not lead to the purpose i.e. the project does not include the preparation of a national water resources program, nor the preparation of the proposal for financing an irrigation program, nor is there included an overall survey of water availability in Nicaragua which would indicate what the sources of water would be for a national irrigation program. It is considered likely, therefore, that before this project could achieve its purpose still another project would have to be launched, namely, the development of a series of watershed studies leading to a national water use plan followed by a financing proposal. Without these last three the outputs of this particular project could be almost useless.

5. It is suggested, therefore, that the Mission rethink this project and consider restructuring its targets to indicate how the Mission intends to reach the goal of achieving irrigation farming on a national scale. Complete analysis of this step-by-step procedure will probably involve extending the termination date of the project and possibly including additional inputs. A revised PROP should be submitted by late spring 1971.

IRWIN