

CHAPTER 6
SCHEDULE OF THE PROJECTS

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6.1 Basic Policy of Project Schedule

For the elaboration of all programs proposed in the Master Plan, for which target year is 2015, the order of this elaboration is very important. The points which should be considered in the ranking according to priority are listed as follows; ① Existence of poor surroundings, ② The low abilities of the farmers, ③ Lack of experience among members. According to these considerations, the programs shall be divided along the 15 years into short, medium and long term periods.

The basic infrastructure services for which the main objective is to improve the small and medium scale farmers, by the construction systems and development model which are the basis of the support services in the initial stage. Since the project dealing with communal development is intended to be implemented as medium term project, it will set up the basis for the implementation of the long term projects. This is the moment in which the agricultural productivity in the area increases through the plan implementation. However, for the larger portion, this is the stage in which each individual project finishes the construction period and starts the management period, independently carried out by small and medium scale farmers. The projects, which do not require high initial investments, are established from the initial period until the end of the study.

Terms	Short Term 2000~2005	Medium Term 2005~2010	Long Term 2010~2015
Target	1. Basic infra-structure 2. Improvement of farmer's ability 3. Development model 4. Farmer support system	1. Extension of development model 2. Extension of support system 3. Promotion of the environment protection	1. The switchover from the construction to O/M stage 2. The modernization promotion of the agriculture in the villages 3. The establishment of the sustainable agriculture

6.2 Project Schedule

The implementation schedule of the individual projects is shown below. The reasons why the promotion of a development model in an early stage is considered to be important are shown below.

- ① The management of the project of agricultural techniques improvement and the organization of farmers is very difficult. This hinders the implementation of the plan, which covers the whole area, from the beginning. The development model, limited to a certain area and number of farmers, will be useful as an experience for the implementation of the projects, stimulating the farmers of other areas to do the same.
- ② The implementation of the development project model will become the basis for the implementation of the other projects.

Term	Short					Medium					Long				
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Development Projects															
Model Projects															
Telica Area Development Project															
Malacatoya Area Development Project															
El Espino Area Development Project															
Suburb-Type Farming Group Model															
Irrigation Projects															
El Sauce Irrigation Project															
Cayanlpe Irrigation Project															
Zarzales Irrigation Project															
Small-scale Irrigation Project															
Road Rehabilitation Project															
Village Road Maintenance Project															
Seed Production Projects															
CESASUR Support Project															
Basic Grains Seed Production Project															
Experimental Research Project															
Rehabilitation of Cotton Research Center															
Strengthening of Extension Services Project															
Strengthening of Extension Services Project															
Livestock Projects															
Small-scale Livestock Extension Project															
Livestock Extension and Research Project															
Marketing															
Market Information gathering and Extension Strengthening Project															
Agricultural Credit															
Agricultural Credit System for Small and Medium scale Farmers															
Farmers Organization															
Rural Leaders' Education Project															
Farmers Organizations' Formation Fund Project															
Farmers Organizations' Strengthening Project															
Extension Services Organizations Strengthening Project															
Environmental Protection Project															
Silvi-agriculture Areas Reforestation Project															
Erosion Protection Project															
Seedling Production for Reforestation Project															

6.3 Project Schedule According to Zones

The Study Area was divided into 5 zones according to characteristics of natural and social conditions. Those projects related with technical extension services, marketing, credit, etc., within the Master Plan which were excluded from the actual implementation due to factors such as the great extent of their coverage area will be formulated taking into consideration of the characteristics of the zones.

(1) Region II - Northern Zone

In this zone, at the initial stage, the silviculture plan as a measure against soil erosion and the plan of expansion of small scale cattle raising activity shall be promoted. Once there are already two seeds production facilities in this zone, an excellent seeds production project will be possible, starting in 2009, during the intermediary stage, when the agricultural production system is ready and there is a high demand. In the El Sauce area, an irrigation project will be carried out, with implementation foreseen for the year 2011. This implementation will be carried out during the final stage when the financial conditions of Nicaragua are expected to be better. This is an important condition once this project implementation comprehends the construction of a dam and high operation costs. The PROTIERRA, PROCHI-LEON will be implemented in this zone, as well as the project of roads improvement in the villages, the project of farmers' organization and the cooperation during the works. The results of the development model are a reference for the realization of the plan in other areas.

Term	Short					Medium					Long				
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Development Projects															
Irrigation Project															
El Sauce Irrigation Project															
Road Rehabilitation Project															
Village Road Maintenance Project															
Seed Production Project															
Basic Grain Seed Production Project															
Experimental Research Project															
Rehabilitation of Cotton Research Project															
Strengthening of Extension Service Project															
Strengthening of Extension Service Project															
Livestock Projects															
Small-scale Livestock Extension Project															
Livestock Extension and Research Project															
Marketing															
Communal Use of Production Facilities Development Project															
Market Information Gathering and Extension Strengthening Project															
Agricultural Credit															
Agricultural Credit System for Small and medium scale Farmers															
Farmers Organization															
Rural Leaders' Education Project															
Farmers Organizations' Formation Fund Project															
Farmers Organizations' Strengthening Project															
Extension Service Organizations Strengthening Project															
Environmental Protection Projects															
Silvi-agricultural Areas Reforestation Project															
Erosion Protection Project															
Seedling Production for Reforestation Project															
Related Projects															
PROTIERRA															
PROCHI-LEON															

(2) Region II -- Southern Zone

The development projects of Telica and El Espino shall be carried out in the initial stage, which will become models of development. The plan for mangrove preservation shall also be carried out in 2004, comprehending the replanting of mangrove near Estero Real. Also in this zone, the existence of seeds production facilities shall be very useful when the agricultural production increases. The Cayalipe irrigation project shall also be carried out in 2011 once it will utilize the el Sauce project dam. An early implementation of the project for formation of farmers' organizations is important because it will become the basis for the implementation of the Zarzales Irrigation Project in the year 2006. The PROTIERRA, PROCHI-LEON projects will be implemented in this zone, as well as the project of roads improvement in the villages, the project of farmers' organization and the cooperation during the works. The results of the development model are a reference for the realization of the plan in other areas.

Term	Short					Medium					Long				
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Development Projects															
Model Projects															
Telica Area Development Project															
El Espino Area Development Project															
Irrigation Project															
Cayanlpe Irrigation Project															
Zarzales Irrigation Project															
Road Rehabilitation Project															
Village Road Maintenance Project															
Seed Production Project															
Basic Grain Seed Production Project															
Experimental Research Project															
Rehabilitation of Cotton Research Project															
Strengthening of Extension Service Project															
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Livestock Projects															
Small-scale Livestock Extension Project															
Livestock Extension and Research Project															
Marketing															
Market Information Gathering and Extension Strengthening Project															
Agricultural Credit															
Agricultural Credit System for Small and medium scale Farmers															
Farmers Organization															
Rural Leaders' Education Project															
Farmers Organizations' Formation Fund Project															
Farmers Organizations' Strengthening Project															
Extension Service Organizations Strengthening Project															
Environmental Protection Projects															
Silvi-agricultural Areas Reforestation Project															
Erosion Protection Project															
Seedling Production for Reforestation Project															
Related Projects															
PROTIERRA															

(3) Region IV – Nicaragua Lake Coastal Area

The Malacatoya development project shall be carried out in the initial stage, which will become a project model. The supporting project to CESASUR shall also be carried out in the initial stage, in the year 2002, once there is only one seeds production facility in this region. As for the farmers' organization projects, a cooperation with PROCHI-LEON shall be examined, as in the northern part of the Region II. The results of the development model

shall be a reference for the realization of the plan in other areas.

Term	Short					Medium					Long				
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Development Projects															
Model Projects															
Malacatoya Area Development Project															
Road Rehabilitation Project															
Village Road Maintenance Project															
Seed Production Project															
CESASUR Supporting Project															
Experimental Research Project															
Rehabilitation of Cotton Research Project															
Strengthening of Extension Service Project															
Strengthening of Extension Service Project															
Livestock Projects															
Small-scale Livestock Extension Project															
Livestock Extension and Research Project															
Marketing															
Communal Use of Production Facilities Development Project															
Agricultural Credit															
Agricultural Credit System for Small and medium scale Farmers															
Farmers Organization															
Rural Leaders' Education Project															
Farmers Organizations' Formation Fund Project															
Farmers Organizations' Strengthening Project															
Extension Service Organizations Strengthening Project															
Environmental Protection Projects															
Silvi-agricultural Areas Reforestation Project															
Erosion Protection Project															
Seedling Production for Reforestation Project															

(4) Region IV - Pacific Mountain Range

In this zone, a silviculture plan shall be promoted as a measure against soil erosion as well as a plan for the expansion of the small scale cattle raising activity, both in the initial stage. The supporting project to the CESASUR shall also be carried out in the initial stage, in the year 2002, once there is only one seeds production facility in this Region. The PROSESUR shall be carried out as a related project, as well as the plan of roads improvement in villages. As for the farmers' organization projects, a cooperation with PROCHI-LEON shall be examined, as in the northern part of the Region II. The results of the development model shall be a reference for the realization of the plan in other areas.

Term	Short					Medium					Long				
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Development Projects															
Road Rehabilitation Project															
Village Road Maintenance Project															
Seed Production Project															
CESASUR Supporting Project															
Experimental Research Project															
Rehabilitation of Cotton Research Project															
Strengthening of Extension Service Project															
Strengthening of Extension Service Project															
Livestock Projects															
Small-scale Livestock Extension Project															
Livestock Extension and Research Project															
Marketing															
Communal Use of Production Facilities Development Project															
Market Information Gathering and Extension Strengthening Project															
Agricultural Credit															
Agricultural Credit System for Small and medium scale Farmers															
Farmers Organization															
Rural Leaders' Education Project															
Farmers Organizations' Formation Fund Project															
Farmers Organizations' Strengthening Project															
Extension Service Organizations Strengthening Project															
Environmental Protection Projects															
Silvi-agricultural Areas Reforestation Project															
Erosion Protection Project															
Seedling Production for Reforestation Project															
Related Projects															
PROSESUR															

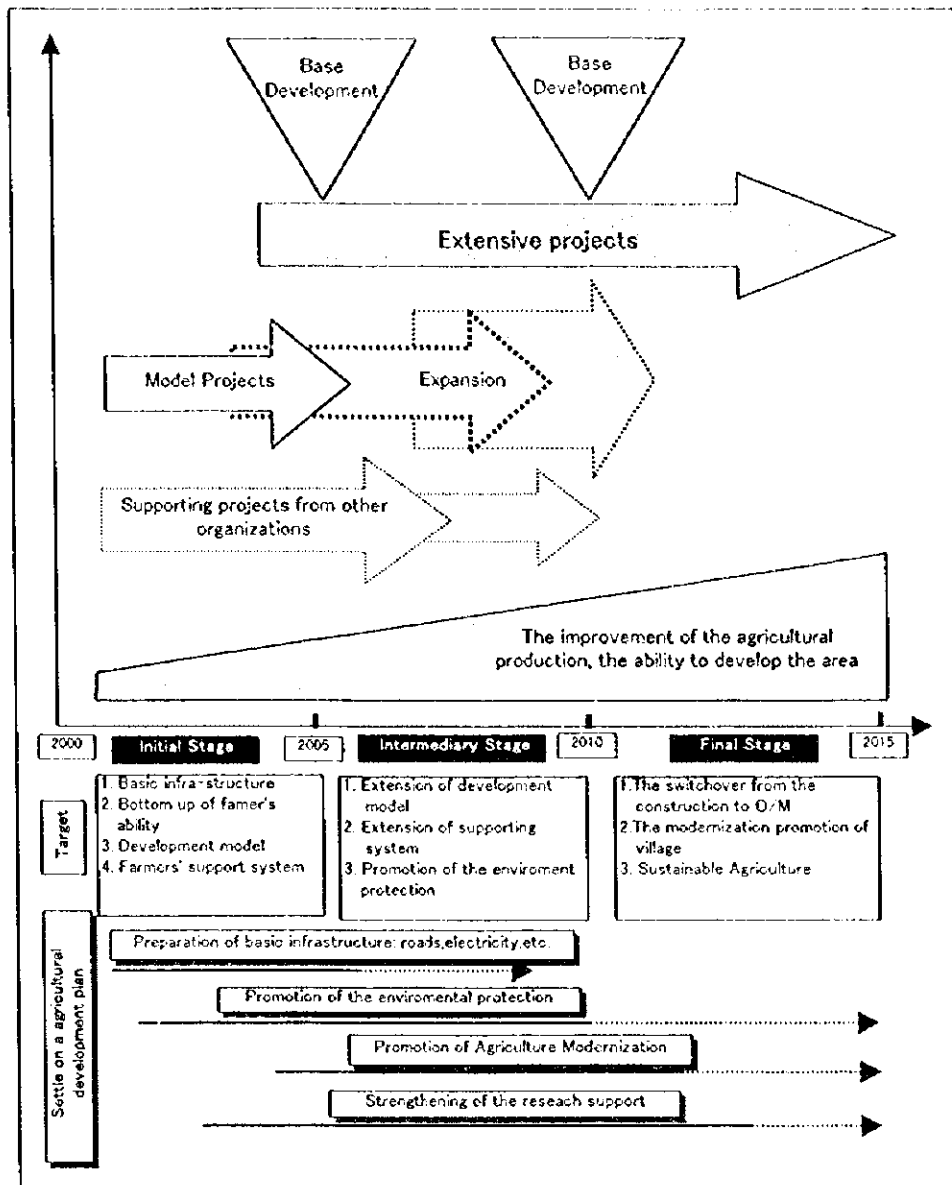
(5) Region IV Upland Area

The projects to be carried out in the initial stage are the model projects for farmers in the suburbs of the cities and the project of silviculture. The supporting project to the CESASUR shall also be carried out in the initial stage, in the year 2002, once there is only one seeds production facility in this Region. Special projects for food security shall be implemented. Especially, the suburb-type farming project will interact with this project in order to provide an-efficient impact. As for the farmers' organization projects, cooperation with PROCIII-LEON shall be examined, as in the northern part of the Region II. The results of the development model shall be a reference for the realization of the plan in other areas.

Term	Short					Medium					Long				
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Development Projects															
Model Projects															
Suburban-Type Farming Group Model															
Road Rehabilitation Project															
Village Road Maintenance Project															
Seed Production Project															
CESASUR Supporting Project															
Experimental Research Project															
Rehabilitation of Cotton Research Project															
Strengthening of Extension Service Project															
Strengthening of Extension Service Project															
Livestock Projects															
Small-scale Livestock Extension Project															
Livestock Extension and Research Project															
Marketing															
Market Information Gathering and Extension Strengthening Project															
Agricultural Credit															
Agricultural Credit System for Small and medium scale Farmers															
Farmers Organization															
Rural Leaders' Education Project															
Farmers Organizations' Formation Fund Project															
Farmers Organizations' Strengthening Project															
Extension Service Organizations Strengthening Project															
Environmental Protection Projects															
Silvi-agricultural Areas Reforestation Project															
Erosion Protection Project															
Seedling Production for Reforestation Project															
Related Projects															
Special Projects for Food Security															

6.4 Executing Agencies

The Government of Nicaragua is, at present, the integrating authority. The executing agencies are MAG, INTA, NARENA, etc., however it is impossible to forecast which of these agencies will carry out the agricultural projects implementation. Nevertheless, as described in the Master Plan, the plans are mutually complementary and shall not present the expected results independently. Therefore, an organism which unifies the plans contained in the Master Plan shall be installed in the MAG.



CHAPTER 7
COST ESTIMATION

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COST ESTIMATION

7.1 Considerations for the Cost Estimation

The MAG does not have a department responsible for centralizing the construction costs for projects, including agricultural projects such as irrigation facilities. Therefore, the unit costs for construction materials were estimated based on consultations to some construction companies in Nicaragua.

- 1) The Exchange rate adopted was US\$ 1.00=C\$ 9.70, as of November, 1997.
- 2) The construction costs were estimated directly by the utilization of the exchange rate.
- 3) As for the cost of miscellaneous items related to the construction, the standard value of constructors in Nicaragua was applied. Miscellaneous cost is shown in the following table.

Expenses	Percentage	Remarks
Indirect Cost	10 to 20% of direct cost	
Administration Cost	8 to 10% of direct and indirect costs	
Utilities	7 to 10% of direct and indirect costs	
Physical Contingency	3% of direct and indirect costs	
Taxes	18.1% of total cost (including physical contingency costs)	<ul style="list-style-type: none"> • 1.1% for permission of construction • 15% for sales tax • 2% for municipal tax

7.2 Projects Costs

The Master Plan projects costs in the Study Area "Region II and Region IV" are shown in the following table. The total project cost is estimated in US\$2,354,812,000, considering the year 2015 as target year.

Project Costs by Category				Unit: US\$ 1,000
Scheme	Executing Agency	Local Portion	Foreign Portion	Project Cost
Model Projects				
Telica Area Development Project	MAG	21,337	4,011	28,378
Malacatoya Area Development Project	MAG	28,800	9,091	37,891
El Espino Area Development Project	MAG	9,951	9,715	19,666
	<i>Sub-total</i>			85,935
Irrigation Projects				
El Sauce Irrigation Project	MAG	54,506	5,631	60,137
Cayanlpe Irrigation Project	MAG	29,094	5,181	34,275
Zarzales Irrigation Project	MAG	32,598	6,976	39,574
	<i>Sub-total</i>			133,986
Small scale Irrigation Projects				
Surface water Irrigation Project	MAG	140,539	22,880	163,419
Groundwater Irrigation Project	MAG	1,738,985	134,096	1,873,080
	<i>Sub-total</i>			2,036,499
Road Rehabilitation Project				
Village Road Maintenance Project	MCT	0	12,004	12,004
	<i>Sub-total</i>			12,004
Seed Production Projects				
Basic Grain Seeds Production Project	MAG/INTA	406	4,229	4,635
CESASUR Support Project	MAG	7,307	22,659	29,966
	<i>Sub-total</i>			34,601
Experimental Research Project				
Rehabilitation of Cotton Research Center	MAG/INTA/ UNAN-Leon	14,341	22,757	37,098
	<i>Sub-total</i>			37,098
Strengthening of Extension Services Project				
Strengthening of Extension Services Project	INTA	3,448	3,448	6,896
	<i>Sub-total</i>			6,896
Marketing				
Market Information Gathering and Extension Strengthening Project	MAG/DGIP	366	333	699
	<i>Sub-total</i>			699
Farmers Organizations				
Rural Leaders' Education Project	MAG/INTA	1,983	1,376	3,359
	<i>Sub-total</i>			3,359
Environmental Protection Project				
Seedling Production for Reforestation Project	MARENA/MAG/ INTA	1,230	1,085	2,315
Erosion Protection Project	MARENA/MAG/ INTA	891	7,425	8,316
Silvi-agricultural Areas Reforestation Project	MARENA/MAG/ INTA			
	<i>Sub-total</i>			10,631
<i>Total</i>				2,354,812

CHAPTER 8
PROJECT EVALUATION

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PROJECT EVALUATION

8.1 Methodology of Economic Evaluation

Economic evaluation of the proposed agricultural projects based on economic benefit and cost is a guideline of assessing their economic viability. In particular, this economic evaluation is considered as one of the most important factors at the stage of master plan. Hence, economic benefit is given as a difference of net benefits between with-project condition and without-project condition in the areas influenced by the proposed projects. In the case of irrigation project, the benefit is estimated as the difference between net value of crop production under irrigated condition and net value of crop production under present condition.

Economic cost differs from financial cost in the sense of value judgment since the former is valued at real shadow price and the latter is a resource cost valued at market prices. In the previous chapter 6, the project costs are estimated on the basis of the market prices. Thus, to estimate the economic costs of the proposed projects, the financial costs have to be converted by using conceivable adjustment.

In estimating the economic cost and benefit, the following criteria and assumptions are applied to transfer the financial values of the project cost and benefit to the economic ones in this master plan study. The reference of "Pautas Metodologicas de Preinversion" by MEDE give an important guideline for economic evaluation. The following factors come from the reference.

Item	Description
Standard conversion Factor (SCF)	0.85
Shadow wage rate	Skilled Worker 1.00 Unskilled Worker 0.70
Shadow Foreign Exchange	1.15 of the prevailing exchange rate
Value of land expropriated	Evaluated through crop production lost by expropriation as negative benefit
Schedule and evaluation period	Base year Beginning of 2001 Construction period 2002 to 2003 Economic life 50 years
Timing of benefit accruing	After the completion of the project. The matured benefit is attained in five years later after the completion.
Price Level	Cost and benefits of the project were set at the beginning of December, 1997. The prevailing exchange rate is C\$9.85 per US\$ at the official rate.
Social discount rate	15%

8.2 Economic Benefit

Market prices of crops are given through market information of MAG. In economic analysis, however, the crops are evaluated not with market prices but with economic prices. In terms of tradable crops, the economic prices are estimated applying international prices. To estimate economic farm-gate prices of crops, the international prices have to be modified in consideration of distribution activities between international market and farm-gate in the project

areas. The economic prices of non-tradable crops such as vegetables and fruits are converted from market prices to economic prices through applying the SCF of 0.85.

Present crop budgets are based on the present farming practices, and are assumed to be pursued in the future in the case of without-project condition. Proposed crop budgets are based on recommended farming practices, and are prepared for with-project condition after introduction of the proposed irrigation projects.

For economic evaluation, economic prices are applied to crop values, input materials and labor costs, applying the conversion criteria mentioned above. The following table include both financial and economic crop budgets under without-project and with-project conditions.

Without-project Condition

Crop	Financial Budget (C\$/Mz)	Economic Budget (US\$/Mz)
Rice	1,882	341
Corn	1,105	190
Sorghum	1,210	309
Beans	2,346	422
Soybeans	1,565	481
Sesame	920	439
Mango	4,186	491
Tobacco	57,229	1,681
Sugar (Renovation)	1,681	534
Sugar (Maintain)	6,056	638

With-project Condition

Crop	Financial Budget (C\$/Mz)	Economic Budget (US\$/Mz)
Rice	6,466	1,014
Corn	3,458	527
Sorghum	2,954	656
Beans	12,158	1,930
Soybeans	1,253	530
Sesame	2,194	843
Tobacco	65,062	2,191
Sugar (Renovation)	5,660	641
Sugar (Maintain)	6,997	747
Cotton	3,891	429
Peanuts	5,920	809
Coffee	6,544	573
Cassava	13,556	1,415
Tomato	98,230	10,195
Chiltoma	7,479	900
Melon	98,009	10,062
Sandia	16,474	1,741
Pipian	19,667	2,093
Avocado	21,694	2,233
Lemon Tahiti	68,832	7,037
Mango	12,579	1,308

Incremental irrigation benefit of the project is estimated as a difference of net production values between with-project and without-project conditions in the future. The net production values under with-project and without-project conditions are calculated as a difference between gross income and production costs.

Every proposed project is expected to produce the following benefits:

Project	Area (Mzs)	Total Benefit (US\$1000)	Unit Benefit	
			(US\$/Mz)	(US\$/ha)
El Sauce	1,850	6,963	3,764	5,377
Cayanipe	1,720	3,279	1,907	2,724
Zarzales	2,570	7,459	2,902	4,145
Telica	1,100	4,490	4,082	5,831
Malacatoya	1,570	3,822	2,434	3,478
El Espino	700	2,273	3,247	4,639

8.3 Economic Cost

The financial construction costs, as described in the previous chapter 6, consist of the following items:

- (a) Direct construction cost of main structures;
- (b) Indirect cost for main works;
- (c) Government administration cost;
- (d) Utility cost;
- (e) Physical contingency cost; and
- (f) Engineering service cost.

The following table shows the construction cost (shown as financial cost) which is estimated based on market prices and economic cost. The economic cost is converted by means of the conversion method mentioned above.

Project Area	(Unit: US\$1000)	
	Financial Cost	Economic Cost
El Sauce	60,051	38,340
Cayanipe	34,209	22,296
Zarzales	39,505	25,976
Telica	23,122	14,314
Malacatoya	29,207	19,042
El Espino	4,739	3,208

The operation and maintenance (O&M) cost is annually required during the economic life of the respective projects in conformity with management of the schemes. The O&M cost is also given by making adjustment to economic prices. The O&M cost is assumed as 0.5% of the total direct construction cost of irrigation schemes.

In order to compare economic efficiency, construction schedule is standardized as follows:

- (1) The first year: engineering services
- (2) The succeeding two years: construction works for irrigation schemes. The annual disbursement of the construction works is assumed to be a half of the total for each year.

8.4 Economic Viability

The economic efficiency, examined by EIRR, B/C and NPV, is summarized in the table below. Hence, present values of cost and benefit for B/C and NPV are discounted at 15%. The social discount rate is set up as 15% in Nicaragua. Zarzales, Telica, and El Espino have EIRRs above

the standard. Even though the EIRR of Malacatoya is below the Nicaraguan standard, it is considered to be feasible from the normal 12% suggested by the World Bank for agricultural projects. The EIRRs of El Sauce and Cayanipe are lower than the two reference standards.

Project Area	EIRR (%)	B/C	NPV (US\$1000)
El Sauce	11.3	0.69	-9,665
Cayanipe	9.7	0.59	-7,438
Zarzales	16.1	1.10	2,157
Telica	17.1	1.24	2,854
Malacatoya	12.8	0.82	-2,758
El Espino	21.9	1.23	2,468

8.5 Farm Budget

Farm budgets under without-project and with-project conditions are financially examined to assess the proposed projects from the point of view of farmer's capacity to pay. Net farm income is calculated by the gross income minus production cost. Net farm income of typical farmers in Telica Project area in Region II and in Malacatoya Project area in Region IV is summarized in the table below.

Item	Region II	Region IV
Average Size of Farm Holding (Mzs)	11.1	5.3
Living Expenses (C\$/ annum)	11,100	11,700
Without-Project Condition		
Planted Area (Mzs)	5.2	3.7
Net Farm Income (C\$/annum)	5,947	4,722
Capacity to Pay (C\$/annum)	-5,154	-6,978
With-Project Condition		
Planted Area (Mzs)	14.9	8.0
Net Farm Income (C\$/annum)	297,483	117,170
Capacity to Pay (C\$/annum)	286,383	105,470
Increment of Farm Income	291,536	112,448

Under without-project condition, a typical farmer in both Regions II and IV can not afford to support their living expense by farm income only. Under with-project condition, however, both typical farmers can support their lives only by farm income. Thus, their capacity to pay ranges from C\$286,383 in Region II to C\$105,470 in Region IV, which are enough to support the irrigation systems.

8.6 Indirect Benefits and Socio-economic Impacts

(1) Foreign Exchange Saving

Domestic crop production in Nicaragua is not sufficient to meet present food consumption, and the deficit is supplemented by import. With project implementation, the production of basic grains in the project sites will increase several times more than that under without-project condition. Accordingly, the increment of basic grain production will contribute the saving of foreign exchange.

(2) Increase in Employment Opportunity

Employment opportunities for the local people will be increased during the construction works of the projects, which will have a favorable impact on the national economy. Furthermore, employees will be able to gain more experience and technical skill in various working fields. These benefits would be applied to the future development of Nicaragua.

In addition to the above construction works, other employment opportunities will be created through farming practices after completion of the projects. In the project sites at the stage of project completion, farming activities will require about 350,000 man-days a year of labor during the busy farming season. That amount of labor requirement is nearly three-quarters more than the existing family labor force (approximately 480,000 man-days) in the project areas, due to intensive use of the land and high productivity.

(3) Rural Agro-industry

The central government is promoting agro-industries in the country. The agro-industry also contributes to create other employment opportunities through crop diversification. The project areas are blessed with natural resources such as climate for agriculture, fertile soils as well as irrigation water upon completion of the projects. The proposed cropping pattern would include vegetables and fruits in addition to basic grains. Thus, there are certain possibilities to promote rural agro-industries for production of food products, being subject to improvement of variety and future studies.

(4) Self-sufficiency of Food Crops

The shortage of basic grains in the target year 2015 is projected against present production as follows: 1.71 million qq of rice; 4.35 million qq of corn; and 0.97 million qq of frijoles. Thus, the incremental production in the proposed project areas contributes for mitigation of the shortage of basic grains in the whole country. It would cover as follows: 17% of rice, 3% of corn and 7% of frijoles. Since it is not sufficient to cover the total deficit, the other irrigation projects should be developed in outside fields of this current project areas.

(5) Inequality of Income Distribution and Redistribution Policy

After completion of the proposed projects, the people in the project areas can get the fruits of development. The living standard of the people in the project areas will be improved because their family income will increase in proportion to the rise of farming production. The better the proposed projects go on, the bigger becomes the difference in farm income between inside the areas of the projects and outside the projects. Although it works as an incentive to increasing the agricultural productivity, an inequality of income distribution is important and serious in order to attain more equitable distribution of the fruits of development. In the case of selection of redistribution policy, the real disparity should be taken into consideration not only in the agricultural sector but also among the whole economic sectors. In addition to taxation system, social welfare, intervention policy in market mechanism, etc., as a redistribution policy by the public sector, it is also important to stimulate activities of the private sector. Business enterprises can invest to productive factories by utilization of private savings which come from living surplus of consumers, and produce goods and services to consumers. Moreover, activation of private economic sector stimulates the market mechanism and creates new labor market. Thus, the fruits of development could be redistributed to the people by this market power from the point of long-run view.

CHAPTER 9

THE SELECTION OF THE PRIORITY PROJECTS

(SELECTION OF THE F/S PROJECTS)

CHAPTER 9

THE SELECTION OF THE PRIORITY PROJECTS (SELECTION OF THE F/S PROJECTS)

9.1 Guidelines of the selection

In Chapter 5, 25 individual projects that can realize the improvement of small farmers' life conditions in the Study Area were listed. All projects are important, but priority must be given to those requiring Feasibility Study and those that can be implemented in an early stage of the Master Plan. Furthermore, those projects shall become the basis of the area development. Considering these aspects, the selection of priority projects were carried out based on the following criteria;

- (1) The project shall become the basis of the area development
- (2) The project shall improve the living conditions of small and medium scale farmers
These two items shall be the basic criteria for the evaluation of all the projects.
- (3) The project shall be implemented in the shorter-term as possible within the plan of activities
Project which shall be implemented within the period between 2001 and 2005.
- (4) The project shall provide direct impacts the sooner as possible
Project which implementation can be basically realized in the shorter term as possible and which directly have impacts on the improvement of beneficiaries' life conditions.
- (5) The project shall benefit both small and medium scale farmers
Although, at present, the knowledge level on agricultural techniques of the small and medium scale farmers is low, the project shall be understood by the farmers and, if it is not possible, specific sub-projects to attain this goal shall be supplied.
- (6) The project by itself shall be advantageous
Each project shall be ordered as for the priority based on the advantages they offer. Therefore, it is important that each project has its own advantages.
- (7) The project shall require a F/S Study
The project, at present, shall require a feasibility study and shall have favorable characteristics for its posterior development. In other words, important components of the project, such as facilities design and budget, shall be clearly defined.
- (8) The project implementation
Once implemented, the project shall allow the obtainment of experiences which makes it possible to implement other similar projects.
- (9) The project shall have a relatively low cost
The project shall be relatively easy to be implemented and shall have low cost considering the present economic conditions of Nicaragua.

9.2 The selection of the priority projects

Based on the above mentioned 9 criteria, the following 3 projects were selected. And, the Feasibility Study which is the first step of the Master Plan will consider the following selected areas in Regions II and IV.

	Project Name/Area	Outline
Region II	The Telica area model development project	This project comprehends irrigation facilities utilizing the Telica river as water resource. It will be a model in the Master Plan.
	The El Espino area model development project	This project comprehends irrigation facilities utilizing wells as water resource. It will be a model in the Master Plan.
Region IV	The CESASUR supporting plan	It is a plan of strengthening of the existing seed center which is in charge of the production, selection and approval of seeds quality (basic grains and vegetables)

The results of the evaluation of each individual project are shown in the following table.

The Selection of the Priority Projects

Selection Criteria	Basis for Regional Development	Key for the Improvement of Living Conditions of Small and Medium Scale Farmers	Short-term Implementation Project	Direct Impact in a Short Term	Capacity to Benefit Both Small and Medium Scale Farmers at the Same Time	Advantageous Project Even When Considered Independently	Need of F/S	Improvement of Capabilities of Related Executing Agencies	Improvement of Results Due to Relatively Low Costs	Comprehensive Evaluation
Development Projects										
Model Projects										
Telica Area Development project	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	
Malacatoya Area Development project	⊙	⊙	○	⊙	⊙	⊙	⊙	⊙	○	
El Espino Area Development project	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	
Suburban -Type Group Farming Model	⊙	⊙	○	⊙	⊙	⊙	⊙	⊙	○	
Irrigation Projects										
El Sauce irrigation project	⊙	⊙	△	○	△	○	⊙	△	△	
Cayanlpe irrigation project	⊙	⊙	△	○	△	○	⊙	△	△	
Zarzales irrigation project	⊙	⊙	○	○	△	○	⊙	△	△	
Road Rehabilitation Project										
Village road maintenance project	⊙	⊙	⊙	⊙	○	⊙	△	△	○	
Seed Production Project										
CESASUR supporting project	⊙	⊙	⊙	⊙	⊙	○	⊙	○	⊙	
Basic grain seeds production project	⊙	⊙	○	⊙	△	△	○	○	○	
Experimental Research Project										
Rehabilitation of cotton research center	⊙	⊙	○	○	△	△	○	⊙	○	
Strengthening of Extension Services Project										
Strengthening of Extension Services Project	⊙	⊙	⊙	⊙	⊙	⊙	△	⊙	○	
Livestock Project										
Small-scale livestock extension project	⊙	⊙	⊙	⊙	⊙	⊙	△	△	⊙	
Livestock extension and research project	⊙	⊙	○	○	△	△	○	○	⊙	
Marketing										
Market information gathering and extension strengthening project	⊙	⊙	○	△	△	△	○	○	△	
Agricultural Credit										
Agricultural credit system for small and medium scale farmers	⊙	⊙	⊙	⊙	○	○	○	△	△	
Farmers Organizations										
Rural leaders' education project	⊙	⊙	⊙	○	⊙	○	○	○	⊙	
Farmers organizations' formation fund project	⊙	⊙	⊙	○	⊙	○	△	△	○	
Farmers organizations' strengthening project	⊙	⊙	⊙	○	⊙	○	○	△	○	
Extension Services Organizations Strengthening Project	⊙	⊙	⊙	○	⊙	△	○	○	⊙	
Environmental Protection Project										
Silvi-agricultural areas reforestation project	⊙	⊙	○	△	△	○	△	△	⊙	
Erosion protection project	⊙	⊙	○	△	△	○	△	△	⊙	
Seedlings production for reforestation project	⊙	⊙	⊙	○	○	⊙	○	○	○	

Note: In the column of the comprehensive evaluation, ⊙ represents a priority project (Feasibility Study), and ○ and △ represent projects with low necessity of a Feasibility Study. In the rest of the table, ⊙ represents the suitability to the selection criterion, ○ means rather suitable, and △ means no relationship.

CHAPTER 10
INITIAL ENVIRONMENTAL EXAMINATION (IEE)

CHAPTER 10

INITIAL ENVIRONMENTAL EXAMINATION

10.1 Environmental Legislation of Republic of Nicaragua

In 1994, Government of Nicaragua issued a decree which imposes the necessity of Environmental Impact Assessment (EIA) on large-scale development projects and MARENA is responsible for the examination of EIA applications. However, the procedure of EIA based on this degree has been carried only in a very few cases so far.

Although the decree mentions about the construction scale which determine the necessity of EIA implementation, the construction scales are not specified in numerical figures and is only mentioned as "*Macro development project*", and therefore there are also a very few cases, in which the Nicaraguan EIA procedure has not been carried out.

In regard to the environmental standards, the industrial and agriculture discharged water standards were published in the official gazette in June 1995. As for air quality, noise, vibration, and solid waste standards, the regulations are being made at present, and therefore the standards in EIA studies, which were conducted in the foreign government aid development projects, were adapted based on their own country's standards. Pesticide and Environment Action plan was established in 1993 in order to avoid the pesticide pollution, and the regulation related to Pesticide was established in 1997.

In regard to EIA procedure, EIA regulation does not define detailed procedure and hence EIA on the foreign government development aid projects were submitted according to their own country's EIA procedure. MARENA is the government organization examining the EIA for the development projects, but a very few EIA specialists are engaged in the MARENA at present, EIA for each project is actually approved with a simple examination.

EIA should be executed based on the following procedure:

- 1) Project description should be filled up in the application form, with an explanation of project activities and it should be submitted to MARENA. MARENA judges whether a full-scale EIA is necessary or not. If EIA is not required, the project description should be approved by MARENA. If EIA is required, then the procedure 2) mentioned below need to be carried out. As already mentioned, the present Presidential Decree related to EIA the construction scales do not specify any numerical figure and is specified only with the term "*Macro development project*". The office of the Director General of Environment determines on which projects require the EIA or not at its own discretion. The effective limit for the EIA is three years and in case of suspension of project implementation, EIA should be improved according to revised conditions.
- 2) EIA should be submitted to MARENA on the large scale development projects. Survey contents and items should be determined by discussion with MARENA. They were determined based on the reference of EIA procedure from the foreign countries.

10.2 Environmental Guidelines of Japan International Cooperation Agency (JICA)

JICA established Environment Guidelines adapted to development activities. The Guideline should be executed in 2 phases, Initial Environmental Examination(IEE)is executed in the first phase, and Environmental Impact Assessment (EIA) is executed in the second phase. IEE is undertaken at the outset of the development project planning stage to determine the environmental impacts which may be created by the particular project. EIA is to study, forecast and evaluate the environmental impacts of a development project, which is judged as detail environmental examination, and to propose the environmental management plan and environmental monitoring plan.

10.3 Environmental Study in the Master Plan

The objectives of the Master Plan is to improve the Small/Medium scale farmers' income in region II and IV of the Pacific regions. The farmers' agricultural production environment in the Study Area has been deteriorated and it is required to improve the farmers' awareness. On the other hand, the study area is too large, and the natural conditions and social environments are very diverse and therefore the environmental constraints should be verified and solved for the 23 subprojects mentioned in the Master Plan.

10.4 Objectives of Initial Environmental Examination

The objectives of Initial Environmental Examination(IEE) in the Master Plan Study are to predict the environmental impacts during the first stage of the project, and to judge the necessity of Environmental Impact Assessment. IEE should be conducted for 23 sub-projects proposed by JICA Study Team.

Republic of Nicaragua established the EIA guidelines, but not IEE guidelines. Therefore IEE study was conducted based on the JICA guidelines of "Environmental Guidelines for JICA Development Study on the Agriculture and Rural Development projects".

10.5 Initial Environmental Examination

There are 58 items which are used for IEE as shown in the Table and these items are evaluated according to the following classification :

Grade A: Significant Environmental Impact is identified or expected,

Grade B: Possible Environmental Impact is identified or expected

Grade C: No Environmental Impact is recognized

The development projects which will have environmental impacts on the natural environment are 6 projects which include 3 irrigation projects and 3 projects excluding "Suburban group agriculture management model project" in the Model development project. These projects may have environmental impacts to 1) change of topography, 2) Change of agriculture management system, 3) River water and underground water. Otherwise the other 17 projects which have the schemes to develop the small scale constructions, significant environmental impacts may not be expected to the natural environment. The 6 development projects mentioned above should also consider environmental measures to socio-economic environment. The issues include water rights, rises in river water level etc. Regarding the other items, most of the inhabitants in the

Study Area are the farmers who are the main beneficiary of the project. Therefore 6 projects mentioned above are discussed in this chapter. The other 17 objects might be examined for negligible environmental impacts.

Table Check list of Environmental Items for Initial Environmental Examination

<p>(1) Socioeconomic Issues</p> <p>1) Social Issues</p> <ul style="list-style-type: none"> a. Planned agricultural settlement b. Involuntary resettlement c. Substantial change in way of life d. Conflict among communities and people e. Former inhabitant g. Others <p>2) Demographic Issues</p> <ul style="list-style-type: none"> a. Population increase b. Drastic change in population component c. Others <p>3) Economic Activities</p> <ul style="list-style-type: none"> a. Relocation of bases of economic activities b. Occupational change, and loss of opportunities c. Increase in income disparities d. Others <p>4) Instructional and custom related to Issues</p> <ul style="list-style-type: none"> a. Adjustment and regulation of water or fishing right b. Changing in social and institutional structure c. Changing in existing institutions and custom d. Others 	<p>(4) Biological and Ecological Issues</p> <ul style="list-style-type: none"> a. Deterioration or degradation of Vegetation b. Negative impacts to important or indigenous fauna and flora c. Degradation of ecosystem with bio-diversity d. Proliferation of exotic and/or hazardous species e. Encroachment on wet land f. Encroachment of tropical forest g. Destruction or degradation of mangrove forest h. Degradation of coral reef i. Others
<p>(2) Health and Sanitary Issues</p> <ul style="list-style-type: none"> a. Increased use of agrichemistry b. Out break of endemic diseased c. Prevalence of endemic disease d. Residual toxicity of agrichemistry e. Increase in domestic and other human waste f. Others <p>(3) Cultural Property Issues</p> <ul style="list-style-type: none"> a. Impairment of historic remains and cultural assets b. Damage to aesthetic sites c. Others 	<p>(5) Soil and Land Resources</p> <p>1) Soil</p> <ul style="list-style-type: none"> a. Soil erosion b. Soil salinization c. Deterioration of soil fertility d. Soil contamination e. Others <p>2) Land</p> <ul style="list-style-type: none"> a. Devastation and desertification of land b. Devastation of hinterland c. Land subsidence d. Others <p>(6) Hydrology, Air and Water quality</p> <p>1) Hydrology</p> <ul style="list-style-type: none"> a. Changes in surface water hydrology b. Changes in ground water hydrology c. Inundation and flooding d. Soil sedimentation e. River degradation f. Independent of inland navigation g. Others <p>2) Water quality and temperature</p> <ul style="list-style-type: none"> a. Water contamination and deterioration of water quality b. Water eutrophication c. Sea water intrusion d. Change of water temperature e. Others <p>3) Atmosphere</p> <ul style="list-style-type: none"> a. Atmospheric pollution b. Others

(1) Telica Area Pilot Study Project

The area is located at the suburban of the city of Leon and its topography is relatively flat. Telica river flows along the north of the Study Area. The development project consists of the following components: Irrigation system, Farm management education, Farm products distribution, Farmers organization (please refer 5th chapter for further detail)

- Evaluation

The environmental impacts to be expected by the project implementation are classified as grade B (possible impact) for 7 items, and grade C (No impact) for 51 items. The justification for evaluating the items as grade B are mentioned below :

Grade B (possible impact) evaluated items	Justification
Increase in income disparities	As the ability of farmer to increase the income improves, disparities occur due to installation of new agricultural management system.
Adjustment of water right	There are 4 pump facilities in the down stream of Telica river
Change in social structure due to organization	This project promotes the farmer organization.
Increased use of agro-chemicals	Increased use of agro-chemicals due to improvement of farm management
Outbreak of endemic diseases	Formative malaria mosquito habitat due to irrigation system
Change in surface water hydrology	Decrease river flow due to for irrigation system
Soil sedimentation	Soil sedimentation is expected in the upstream side of the pump facility.

- Conclusion

For the seven items evaluated as grade B, when significant environmental measures will be established in the phase of master plan, the project implementation is expected to decrease the environmental impacts or mitigate the impacts to surroundings. Water volume measurement is not conducted in Telica river and therefore it is not possible for the coordination of water right. The water volume measurement is necessary for the project implementation.

Projected irrigation area is large which is about 1,600 Mz and water will be pumped up to the area. Therefore Environmental Impact Assessment is necessary for project implementation. However the time limit of EIA procedure of GON is 3 years and the area can be studied in the second phase feasibility study regarding the 7 items evaluated as B grade and EIA will be conducted before project implementation.

(2) El Espino Area Pilot Study Project

The area is located in the suburban of municipality Maplaisillo, and the topography of the area is rolling gently. The development project consists of following components: Irrigation system, Farm management education, Farm products distribution, Farmers organization (please refer 5th chapter for further detail)

- Evaluation

The environmental impacts to be expected by the project implementation are B for 4 items, and C for 54 items. The items are evaluated as B on the basis of following justification mentioned below:

Grade B evaluated items	Justification
Increase in income disparities	As the ability of farmer to increase the income improves, disparities occur due to installation of new agricultural management system.
Change in social structure due to organization Increased use of agro-chemicals	This project promotes the farmer organization. Increased use of agro-chemicals due to improvement of farm management
Change in surface water hydrology	Decrease of river flow due to for irrigation system

- Conclusion

For the four items evaluated as B grade, when significant environmental measures will be established in the phase of master plan, the project implementation is expected to decrease the environmental impacts or mitigate the impacts to surroundings. Irrigation area of this project is about 140 Mz , beneficiary is 60 families and so EIA is not required. However the 4 items evaluated as B grade should be examined for the environmental considerations and then EIA will be conducted before project implementation. As water source for the irrigation system is underground water, change of underground water level may be expected, and sustainable water use plan should be formulated and monitoring of underground water level should be carried out to measure the water volume of underground water.

(3) Malacatoya area pilot study project

The area is located near the Lake Nicaragua, suburban of city of Granada. Topography is flat. The project consists of following components of Irrigation system, farm management education, Agriculture products circulation, Farmer organization (please refer chapter 5 for further detail)

- Evaluation

The environmental impacts to be expected by the project implementation are B for 3 items, and C for 55 items. The items are evaluated as B on the basis of following justification

Grade B evaluated items	Justification
Increase in income disparities	As the ability of farmer to increase the income improves, disparities occur due to installation of new agricultural management system.
Change in social structure due to organization Increased use of agro-chemicals	This project promotes the farmer organization. Increased use of agrochemicals due to improvement of farm management

- Conclusion

For the three items evaluated as B grade, when significant environmental measures will be established in the phase of master plan, the project implementation is expected to decrease the environmental impacts or mitigate the impacts to surroundings. Irrigation area of this project is large, equal to 1,600 Mz. Since the water source is the lake Managua, environmental impacts are negligible, and coordination of water right is not necessary. So EIA is not required. However the target year of project implementation will be planned as 2005. And when there is a drastic change in socio - or natural environment, Initial Environmental Examination(IEE) and Environmental Impact Assessment(EIA) may be necessary for second time.

(4) El Sause irrigation project

The area is located in the small mountain village of about 60 km north east of city of Leon. Grande river occurs in the north of El Sause. This is the irrigation project including dam, canal(see chapter 5 for further detail)

- Evaluation

The environmental impacts to be expected by the project implementation are B grade for 6 items, and C grade evaluated for 52 items. The items evaluated as B based on the following justification.

Grade B evaluated items	Basis
Increase in income disparities	As the ability of farmer to increase the income improves, disparities occur due to installation of new agricultural management system.
Adjustment of water right	There are some pump facilities in the down stream side of Grande river
Increased use of agro-chemicals	Increased use of agro-chemicals due to improvement of farm management
Outbreak of endemic disease	Formative malaria mosquito habitat due to irrigation system
Change in surface water hydrology	Decrease river flow due to for irrigation system
Soil sedimentation	Soil sedimentation expected in the upper stream side of pump the facility.

- Conclusion

For the 6 items evaluated B grade, when significant environmental measures will be established in the phase of master plan, the project implementation is expected to decrease the environmental impacts or mitigate the impacts to surroundings. Water volume measurement is not conducted in Grande river in the study area. It is the basic material for adjustment of water right. So water volume measurement should be done for project implementation. As irrigation area of this project is large equal to 1,900 Mz, and there are some pump facilities along the river, Environmental Impact Assessment(EIA) is required. And this project is planned in the year of 2011. Since the socio and environmental conditions are expected to be changed in the period, Initial Environmental Examination(IEE) will be restudied on the feasibility study phase and Environmental Impact Assessment should be conducted if needed.

(5) Cayanlpe Irrigation project

The Project area is located on a flat land at 40 km from Chiandega city and Villanueva river runs at the northern upstream side. Grande river which is the water source of Elsausa project is a tributary of Villanueva river. This project mainly include construction of irrigation facilities including intake, canal etc (please refer chapter 5 for more details).

- Evaluation

The environmental impacts to be expected by the project implementation are B grade for 6 items, and C grade evaluated for 52 items. The items evaluated as B based on the following justification.

Grade B evaluated items	Basis
Increase in income disparities	As the ability of farmer to increase the income improves, disparities occur due to installation of new agricultural management system.
Adjustment of water right	There are some pump facilities in the down stream side of Villanueva river
Increased use of agro-chemicals	Increased use of agro-chemicals due to improvement of farm management
Outbreak of endemic disease	Formative malaria mosquito habitat due to irrigation system
Change in surface water hydrology	Decrease river flow due to for irrigation system
Soil sedimentation	Soil sedimentation expected in the upper stream side of pump the facility.

- Conclusion

For the 6 items evaluated B grade, when significant environmental measures will be established in the phase of master plan, the project implementation is expected to decrease the environmental impacts or mitigate the impacts to surroundings. Water volume measurement is not conducted in Villanueva river in the study area. It is the basic material for adjustment of water right. So water volume measurement should be done for project implementation. As irrigation area of this project is large equal to 1,700 Mz, and there are some pump facilities along the river, Environmental Impact Assessment(EIA) is required. And this project is planned in the year of 2011. Since the socio and environmental conditions are expected to be changed in the period, Initial Environmental Examination(IEE) will be restudied on the feasibility study phase and Environmental Impact Assessment should be conducted if needed.

(6) Zarzales Irrigation Project

The Project area is located on a flat land at the northern side of Lake Managua and Sinecapa river runs through the area. This project mainly include construction of irrigation facilities including intake, canal etc (please refer chapter 5 for more details).

- Evaluation

The environmental impacts to be expected by the project implementation are B grade for 6 items, and C grade evaluated for 52 items. The items evaluated as B based on the following justification.

Grade B evaluated items	Basis
Increase in income disparities	As the ability of farmer to increase the income improves, disparities occur due to installation of new agricultural management system.
Adjustment of water right	There are some pump facilities in the down stream side of Sinecapa river
Increased use of agro-chemicals	Increased use of agro-chemicals due to improvement of farm management
Outbreak of endemic disease	Formative malaria mosquito habitat due to irrigation system
Change in surface water hydrology	Decrease river flow due to for irrigation system
Soil sedimentation	Soil sedimentation expected in the upper stream side of pump the facility.

- Conclusion

For the 6 items evaluated B grade, when significant environmental measures will be established in the phase of master plan, the project implementation is expected to decrease the environmental impacts or mitigate the impacts to surroundings. Water volume measurement is not conducted in Sinecapa river in the study area. It is the basic material for adjustment of water right. So water volume measurement should be done for project implementation. As irrigation area of this project is large equal to 1,700 Mz, and there are some pump facilities along the river, Environmental Impact Assessment(EIA) is required. And this project is planned in the year of 2011. Since the socio and environmental conditions are expected to be changed in the period, Initial Environmental Examination(IEE) will be restudied on the feasibility study phase and Environmental Impact Assessment should be conducted if needed.

CHAPTER 11
CONCLUSIONS AND RECOMMENDATIONS

CHAPTER 11

CONCLUSIONS AND RECOMMENDATIONS

This Master Plan of the Agricultural development Project for the Region II and IV in the Pacific Coast, which targets the year of 2015, contributes not only to make the balanced development through supporting of the small and medium farmers suffering from poverty in the regions but also to increase food production and economic growth of the nation.

Political changes of supporting farmers during the past have equally affected the agricultural producing situations and their consciousness of the small and medium farmers in Nicaragua. Differences of natural and social environment in the Study area have also brought up disparity in wealth within the farmers. In the Master Plan Study the region II and IV were divided respectively into two zones and three zones, and the development plans of each zone were proposed based on their natural and social conditions. Then twenty-three individual projects in the eleven fields of supporting the small and medium farmers were formulated to materialize the each development.

Agricultural producing conditions related to the small and medium farmers in the Study area are very hard considering the frail agricultural infrastructures, the low farming technology, in addition to the low level of the social infrastructures. Therefore, all of the projects proposed in the Master plan have high priority in its urgency but the following matters should be recommended to carry out them effectively.

1. Executing Organization

Executing organizations such as MAG, INTA and so forth in Nicaragua have neither enough experience to cope up with diversity of the above mentioned individual projects, nor sufficient staff to do them. The region offices, which play an important role in executing the projects, also have same problems. With difficult situation such as reducing the staff furthermore due to national financial trouble, in spite of difficulty to appoint new staff to take charge of the projects, it is recommendable to arrange urgently the related executing organization by rearrangement of the staff.

2. High Priority Projects

Three projects which are given high priority are not only effective for improvement of living standard of the small and medium farmers but also a key for the implementation of successive individual projects. That is to say that these three projects include the components of the improvement of capability of the executing organizations and the reform of consciousness of the small and medium farmers as the beneficiaries. Therefore, these projects should be urgently implemented prior to the others projects.

3. Preparation of Budget for Implementation

Executing organizations of MAG, INTA and the region offices have no sufficient vehicles necessary for the implementation of the projects. The government should procure the vehicles through purchase or repairs of left cars due to lack of budget. It can be important that each executing organization prepare budget through arrangement for the implementation of the projects by preparing vehicles as well as staffs.

4. Selection of Foreign Assistance Organization

All of the projects could be implemented by the Government of Nicaragua. But its implementation by its own budget is difficult due to lack of the national finance. Therefore, the Government should select the foreign assistance organization to request loans or donation according to the character of the projects.

5. Supporting Small and Medium Farmers Prior to Implementation of the Projects

The small and medium farmers in the Study area involve the issues such as "no-pay culture" and tendency against grouping. It could be firmly believed that these issues could be solved with increasing their living standard after the implementation of the projects. However, to get an effective result of the projects, the executing organizations should thoroughly explain and guide the small and medium farmers about the idea and objective of the Master plan and individual projects in the first stage of the implementation.

6. Understanding of the Basic Conditions

Within the rivers which are considered for its utilization of the open flow discharge in the irrigation project, some rivers have no data of the river discharge. These rivers have a character that discharge tends to largely differ from at the adjacent two points of the specified river. Therefore, survey of river discharge should be started or continued at the point specified for analysis of the irrigation project.


ATTACHMENTS

ATTACHMENT-1
SCOPE OF WORKS

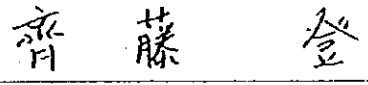
**MINUTES OF MEETING
ON
SCOPE OF WORK
FOR
THE STUDY
ON
AGRICULTURAL DEVELOPMENT
FOR
THE REGION 2 AND 4
IN
THE PACIFIC COAST
IN
THE REPUBLIC OF NICARAGUA**

**AGREED UPON BETWEEN
MINISTERIO DE AGRICULTURA Y GANADERIA
AND
JAPAN INTERNATIONAL COOPERATION AGENCY**


Managua, 20 March, 1997



Dr. Horadio Jarquin Delgado
Vice Minister,
Ministerio de Agricultura y Ganaderia
(MAG)



Mr. Noboru Saito
Leader,
Preparatory Study Team,
Japan International Cooperation
Agency (JICA)



Ms. Isolda Fraxione Miranda
Directora General Gestión Bilateral
Ministerio de Cooperación Externa
(MCE)

In response to the request of the Government of Nicaragua (hereinafter referred to as "GON"), the Government of Japan (hereinafter referred to as "GOJ") decided to dispatch through Japan International Cooperation Agency (hereinafter referred to as "JICA"), which is responsible for the implementation of technical cooperation programs of GOJ, the preparatory study team (hereinafter referred to as "the Team") headed by Mr. Noboru Saito, to Nicaragua from March 11th to March 27th, 1997 so as to discuss and exchange views on the study with Ministerio de Agricultura y Ganaderia (hereinafter referred to as "MAG"), and officials concerned of GON for the implementation of the study.

MAG and the Team mutually agreed to the Scope of Work for the Study on Agricultural Development for the Region 2 and 4 in the Pacific Coast in the Republic of Nicaragua (hereinafter referred to as "the Study").


The following minutes were prepared to confirm the main issues discussed and matters agreed upon by both sides in connection. The list of participants in a series of meetings is attached as ANNEX 1.

1. Identifying the projects to conduct a Feasibility study are principally based on the following criteria, for example:


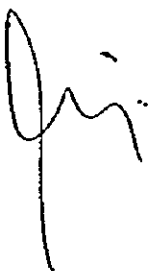
- * To select area where the understanding for the necessity of the projects is deep among farmers and potential for organizing farmers is high.
- * To select area where potential of agricultural development(water resources, soil, etc.) is high.
- * To select area where condition of marketing is comparatively good and demonstration effect is high.
- * To select area where possibility to diversify crops is high and conversion to non-traditional crops is expected in the near future from traditional crops.
- * To select area where rehabilitation and construction of agricultural infrastructures(irrigation facilities, etc.) are urgently required.

2. For the smooth implementation of the Study, both sides agreed upon the necessity of establishing a Steering Committee for the Study. The Steering Committee will be formed comprising the following institutions:

Ministerio de Agricultura y Ganaderia (MAG) - coordinator
Ministerio del Ambiente y de los Recursos Naturales (MARENA)
Instituto Nicaraguense de Reforma Agraria (INRA)
Instituto Nicaraguense de Tecnologia Agraria (INTA)
Programa Nacional de Desarrollo Rural (PNDR)
Ministerio de Cooperacion Externa (MCE)
Embassy of Japan(EOJ) - observer



3. The work for topographic mapping will be conducted as a part of the study between Phase I and Phase II, which will take about five(5) months, in case it is considered as necessary.
4. The concept of the Pilot Study was discussed and agreed in principle based on the paper attached as ANNEX 2.
The Nicaraguan side will guarantee the operation and maintenance of the pilot study farm.
5. MAG requested that the additional vehicles and necessary equipment (personal computer, copying machine, etc.) for the study other than provided by Nicaraguan side and should be provided by JICA. The Team promised to convey the request to the GOJ.
6. MAG requested that the counterpart personnel training in Japan related to the study to promote an effective technology transfer. The Team promised to convey this request to GOJ.
7. The Final Reports shall be opened to public whenever it shall be requested.



LIST OF PARTICIPANTS

1. Nicaraguan Side

1) MAG

Alvaro Montalvan Pallais	Direccion General de Cooperacion Externa
Cecilia Bacz Ordonez	Direccion General de Cooperacion Externa
Carmen Largaespada	Direccion Politicas y Programas
Eduardo Hanon	Direccion Politicas y Programas
Cidar Cardenas	Unidad Formuladora de Proyectos
Alberto Jose Morales	Unidad Formuladora de Proyectos
Ottoniel Saravia C.	Unidad Formuladora de Proyectos
Erwing Gutierrez	Direccion Delegaciones Regionales
Alvaro Icaza V.	Direccion Delegaciones Regionales
Luis Mejia Selva	Direccion Delegaciones Regionales
Francisco Montalvan	Delegado Regional II
Carlos M. Espinoza	Delegado Regional IV
Arkangel Abhaunza	Programa Agricola
Orlando Siu S.	Consultor

2) PNDR

Juan Jose Quintanilla	Region IV (PROSESUR)
Carlos Espinoza	Region II

3) MARENA

Damaso Barquero	Planif. Forestal
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4) INRA

Francisco Chevez H.	Direc. Planific.
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5) INTA

Danilo Montalvan	Cooperacion Externa
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6) MCE

Alejandro Maltez	Consultor
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2. Japanese Side

1) Preparatory Study Team

Noboru Saito	Leader
Tomoki Sato	Member
Shigeru Nishihara	Member
Kenichiro Kobayashi	Member
Yoshitaka Ishikawa	Member

2) Embassy of Japan

Satoshi Uematsu	Second Secretary
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The Pilot study on Agricultural Development for the region 2 and 4 in the Pacific Coast

1. Justification of the Pilot Study

In the study area, the rural economy has deteriorated due to a considerable drop in the cotton price. There is an urgent need to establish more productive agricultural system including the introduction of new crop varieties and technologies as well as the provision of agricultural infrastructure.

Groundwater is the main water source for agriculture in the study area. Irrigation development with more sophisticated groundwater exploitation seems to have a great potential and is likely to be given a priority for the agricultural development in the area. Appropriate farming systems and the operation and maintenance are the key factors to determine the sustainability of such project. Thus the pilot study is proposed in order to verify the sustainability of groundwater irrigation and to identify possible difficulties and problems which might arise in due course. Based on these close monitoring and evaluation of the pilot study, it makes it possible to formulate plans that are more feasible and realistic to be implemented.

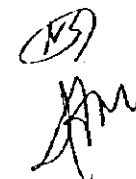
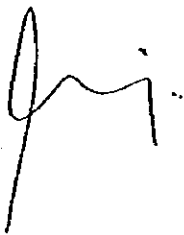
In addition to the existing wells, if necessary, a new well will be dug to carry out pumping tests and to monitor the groundwater level. This new well will serve as water source for the irrigation component for the pilot study.

2. Outline of the pilot study

(1) Objectives

1) During the phase III, the activities proposed in the study (e.g. introduction of new crops) will be put into practice on a small scale. It is intended to examine whether the groundwater reserve will be the sustainable water supply source for irrigation proposed in the study as well as to identify difficulties and problems that are not fully addressed in the initial plan. These findings will be taken into consideration prior to the formation of the plan on a full scale.

2) The pilot study will offer opportunities to transfer new technologies on irrigation farming to the Nicaraguan counterparts and local farmers through practical training on the ground. At the same time, the pilot farm is expected to have a demonstration effect to the surrounding areas.



(2) The Location

An appropriate area selected in the Region 2 with the high groundwater potential

(3) Pilot Farms

1) The number of farmers to participate in the pilot study

About 10 households : a part of one polo preferably

2) Area to be irrigated

About 10 ha : the area which could be irrigated by the groundwater tapped from one well.

3) Crops to be planted

Will be decided

4) The design of the facilities (tentative)

Whether the following facilities and equipment will be provided by the Japanese side or not will be examined as soon as the details are agreed upon. The proposed designs specified in the below are subjected to changes in the course of the study.

a) Well (test well is used)

b) Pumping facilities

Pump (head 30-50m and 10 l/s)

Dynamo (20 HP)

Switchboard

Shed

c) Irrigation facilities

Main pipeline

Movable sprinkler

(4) Monitoring activities on the pilot farm

a) The ground-water level and the water quality (the monitor of the ground-water level and the water quality are conducted other existing wells).

b) Underground water use (pump up results and irrigation results, etc.)

c) Operation and maintenance (pump operation condition and operation and maintenance organization activity condition, etc.)

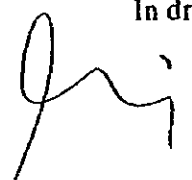
d) Farming (growing condition, yield, and farming work)

e) Farm household economy (farming cost and earnings)

3. Action of the Study Team

(1) The Study Team dispatch schedule to Nicaragua

In dry season (from November to April) and in rainy season (from May to October) ; 2 seasons,



respectively.

Japanese side will decide a period that the study team is dispatched in obedience to farming pattern etc.

(2) Matters by which study and guidance are done

Irrigation technique (Irrigation volume of water, time, and method etc.)

Operation and maintenance (operation and organization etc.)

Farming guidance

Additional, advice to various problems

Japanese side will dispatch experts (e.g. experts in irrigation, farming, operation and maintenance).

4. Activities to be done by the Nicaraguan side for the pilot study

(1) In order for the pilot study to succeed, farmers will have to be the main actors to implement the plan with the assistance and advice from government staff in accordance with the pilot study plan (e.g. farming system, operation and maintenance, implementing mechanism), which will be formulated by the study team in close cooperation with the Nicaraguan side. The Nicaraguan government should also be actively involved in the implementation of the pilot study, for example, collecting data and information (keeping records of on-farm activities from planting to harvesting, operating hours of pumps, amount of fertilizers and pesticides applied, etc.).

(2) Prior to the selection of the pilot farms, the candidates will be selected with consultation between MAG and the farmers who will be the beneficiary in the region.

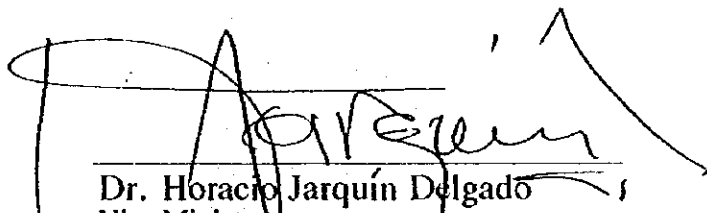
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**SCOPE OF WORK
FOR
THE STUDY
ON
AGRICULTURAL DEVELOPMENT
FOR
THE REGION 2 AND 4
IN
THE PACIFIC COAST
IN
THE REPUBLIC OF NICARAGUA**

**AGREED UPON BETWEEN
MINISTERIO DE AGRICULTURA Y GANADERIA
AND
JAPAN INTERNATIONAL COOPERATION AGENCY**

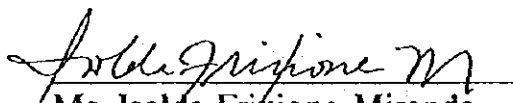
Managua, 20 March, 1997



Dr. Horacio Jarquín Delgado
Vice Minister,
Ministerio de Agricultura y Ganadería
(MAG)



Mr. Noboru Saito
Leader,
Preparatory Study Team,
Japan International Cooperation
Agency (JICA)



Ms. Isolda Frixione Miranda
Directora General Gestión Bilateral
Ministerio de Cooperación Externa
(MCE)

I. Introduction

In response to the request of the Government of the Republic of Nicaragua (hereinafter referred to as "GON"), the Government of Japan (hereinafter referred to as "GOJ") has decided to conduct the Study on Agricultural Development for the Region 2 and 4 in the Pacific Coast in the Republic of Nicaragua (hereinafter referred to as "the Study"), in accordance with the relevant laws and regulations in force in Japan.

Accordingly, Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of technical cooperation programs of GOJ, will undertake the Study in close cooperation with the authorities concerned of GON.

The present document sets forth the scope of work with regard to the Study.

II. Objectives of the Study

The objectives of the Study are;

1. To formulate a Master Plan for agricultural development for region 2 and 4 in the pacific coast in the Republic of Nicaragua,
2. To conduct a Feasibility Study to formulate development plans prioritized in the Master Plan, to execute a pilot study in the selected area identified in the course of the study, and
3. To carry out technology transfer to the Nicaraguan counterpart personnel through on -the-job training in the course of the Study.

III. Study area

The Study area are Region 2 (approximately 9,900km²) and 4 (approximately 4,700km²) in the Pacific coast.

IV. Scope of the Study

In order to achieve the above objectives, the Study will consist of three (3) phases and the following items.

1. Phase I (Master Plan Study for Region 2 and 4)

1.1. To review the existing development plans and policies.

1.2. To collect, review and analyze relevant existing data and information and field survey:



(1) Natural condition

- a. topography
- b. vegetation
- c. meteorology
- d. hydrology
- e. geology
- f. soil
- g. water quality
- h. others

(2) Social and economic condition

- a. population
- b. household
- c. gender issues
- d. employment
- e. regional economy
- f. farmers' economy
- g. land tenure
- h. rural and social infrastructure
- i. agricultural credit
- j. others

(3) Agricultural condition

- a. land use and cropping pattern
- b. agricultural production
- c. livestock production
- d. irrigation and drainage system
- e. water management
- f. agricultural facility and infrastructure
- g. farmers' organizations
- h. agricultural supporting system
- i. postharvest and marketing system
- j. others

(4) Environmental conditions

- a. natural condition
- b. social condition
- c. others

(5) Other information related to the project

- a. administrative organization
- b. others

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AM

1.3. To identify development needs and constraints.

1.4. To formulate basic development plan, considering the following points:

- (1) Land use
- (2) Farm management
- (3) Livestock production
- (4) Irrigation and drainage
- (5) Agricultural and rural infrastructure
- (6) Investigation, agricultural extension and supporting system
- (7) Agricultural credit
- (8) Postharvest and marketing system
- (9) Farmers' organization

1.5. Initial Environmental Examination (IEE) .

1.6. To select priority projects for the feasibility study in Phase II .

2. Phase II (Feasibility study for selected projects)

2.1. To collect additional data and information, and detailed field survey.

2.2. To conduct feasibility study for the selected projects, considering the following points:

- (1) Land use
- (2) Farm management
- (3) Livestock production
- (4) Irrigation and drainage
- (5) Agricultural and rural infrastructure
- (6) Operation and maintenance
- (7) Investigation, agricultural extension and supporting system
- (8) Agricultural credit
- (9) Postharvest and marketing system
- (10) Farmers' organization
- (11) Environmental conservation
- (12) Preliminary design of major structures
- (13) Estimation of the projects cost and benefit

2.3. To conduct test well drilling, pumping test, and to collect data, if necessary

2.4. To prepare implementation schedule

2.5. To evaluate the projects

2.6. To formulate pilot study plan, with the following components:

- (1) Inventory survey on actual conditions of communities in the selected



area

- (2) Selection of a community for the pilot study
- (3) Planning for pilot study (facilities, crop production, extension, groundwater observation, operation and maintenance, etc.)

2.7. To make preliminary recommendations

3. Phase III (The pilot study implementation and final recommendations)

3.1. To implement the pilot study

- (1) Construction of the facilities for the pilot study
- (2) Monitoring of groundwater use condition
- (3) Monitoring of crop production
- (4) Monitoring of operation and maintenance
- (5) Evaluation of the pilot study and feedback for the development plan

3.2. To make final recommendations

V. Study schedule

The Study will be carried out in accordance with the attached tentative work schedule.(ANNEX 1)

VI. Reports

JICA shall prepare and submit the following reports in Spanish to GON.

1. Inception Report

Twenty (20) copies at the commencement of the Phase I field work.

2. Progress Report (1)

Twenty (20) copies at the end of the Phase I field work.

3. Interim Report

Twenty(20) copies at the commencement of the Phase II field work.

4. Progress Report (2)

Twenty (20) copies at the end of the Phase II field work.

5. Draft final Report

Twenty(20) copies in Spanish and English (only Main Report) at the end of the Phase II home office work. GON shall submit their comments within one (1) month after the receipt of the Draft Final Report.

In case any doubt arises in interpretation, English text shall prevail.

6. Monitoring Progress Report(1)

Twenty(20) copies around the halfway of Phase III.

7. Monitoring Progress Report(2)

Twenty(20) copies at the end of Phase III. GON shall submit their comments within one (1) month after the receipt of the Monitoring Progress Report(2).

8. Final Report

Fifty (50) copies in Spanish and English (only Main Report) within four (4) months after the receipt of the comments by Nicaragua on the Monitoring Progress Report(2).

In case any doubt arises in interpretation, English text shall prevail.

VII. Undertakings of GON

1. To facilitate the smooth conduct of the Study, GON will take the following necessary measures:

(1) To inform members of the Japanese study team (hereinafter referred to as "the Team") any existing risk in the Study area and to take any measures deemed necessary to secure the safety of the Team.

(2) To permit the members of the Team to enter, leave and sojourn in Nicaragua for the duration of their assignment therein, and exempt them from foreign registration requirements and consular fees,

(3) To exempt the members of the Team not only from taxes on purchase of equipment and other materials as well as services required for the conduct of the Study, but from taxes, duties, fees and any other charges on equipment, and other materials brought into Nicaragua for the conduct of the Study,

(4) To exempt the members of the Team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Team for their services in connection with the implementation of the Study,

(5) To provide necessary facilities to the Team for the remittances as well as the utilization of the funds introduced into Nicaragua from Japan in connection with the implementation of the Study,

- (6) To take necessary action to obtain permission for the Team to enter into private properties or restricted areas for the implementation of the Study,
- (7) To secure permission for the Team to take all data and documents including photographs and maps after authorization by responsible organizations concerned, related to the Study out of Nicaragua to Japan,
- (8) To provide medical services in case of necessity, and the fees shall be chargeable to the members of the Team.
2. GON shall bear claims, if any arises, against the members of the Team resulting from, occurring in the course of, or otherwise connected with, the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the members of the Team.
3. Ministerio de Agricultura y Ganaderia (hereinafter referred to as "MAG"), shall act as a counterpart agency to the Team and also as coordinating body in relation with other relevant organizations for the smooth implementation of the study.
4. MAG shall, at its own expense, provide the Team with the following, in cooperation with other relevant organizations;
- (1) Available data and information related to the Study,
 - (2) Additional survey related to the Study, if necessary,
 - (3) Counterpart personnel and supporting staff,
 - (4) Suitable office space with necessary equipment in Managua and selected project areas,
 - (5) Credentials or identification cards, and
 - (6) Necessary number of vehicles with drivers.

VIII. Undertakings of JICA

For the implementation of the Study, JICA shall take the following measures;

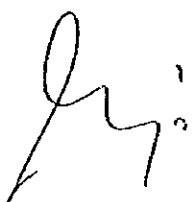
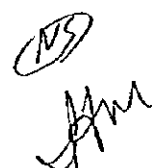
1. To dispatch, at its own expense, the study team to Nicaragua,
2. To pursue technology to counterparts personnel in the course of the Study.

IX. Consultation

JICA and GON shall consult with each other in respect of any matter that may arise from or in connection with the Study.

X. Translation

The Scope of Work is prepared both in English and in Spanish, and the both versions are signed by the both parties. In case any doubt arises in interpretation, the English text shall prevail.

A handwritten signature in black ink, appearing to be 'Jy' with a small mark above the 'y'.Handwritten initials in black ink, consisting of 'MS' in a circle above 'AM'.

ANNEX 1

TENTATIVE WORK SCHEDULE

MONTH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35		
ITEM																																					
Works in the Nicaragua																																					
Works in Japan																																					
Phase	← PHASE I →										← PHASE II →										← PHASE III →																
Report	△ Ic/R	△ P/R(I)	△ It/R	△ P/R(II)	△ It/R	△ P/R(II)	△ P/R(II)	△ P/R(II)	△ P/R(II)	△ P/R(II)	△ P/R(II)	△ P/R(II)	△ P/R(II)	△ P/R(II)	△ P/R(II)	△ P/R(II)	△ P/R(II)	△ P/R(II)	△ P/R(II)	△ P/R(II)	△ P/R(II)	△ P/R(II)	△ P/R(II)	△ P/R(II)	△ P/R(II)	△ P/R(II)	△ P/R(II)	△ P/R(II)	△ P/R(II)	△ P/R(II)	△ P/R(II)	△ P/R(II)	△ P/R(II)	△ P/R(II)	△ P/R(II)	△ P/R(II)	

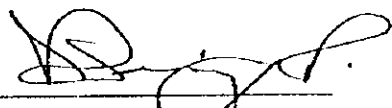
- (Remarks) Ic / R : Inception Report
- P / R(I) : Progress Report(1)
- It / R : Interim Report
- P / R(II) : Progress Report(2)
- Df / R : Draft Final Report
- M / R(I) : Monitoring Progress Report(1)
- M / R(II) : Monitoring Progress Report(2)
- F / R : Final Report
- ⊙ : Comments on Df / R or M/R(II) by the Nicaragua side

ATTACHMENT-2
MINUTES OF MEETING

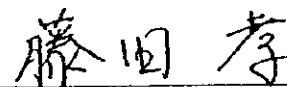
MINUTES OF MEETING
ON
THE INCEPTION REPORT
FOR
THE STUDY
ON
AGRICULTURAL DEVELOPMENT
FOR
THE REGION II AND IV
IN
THE PACIFIC COAST
IN
THE REPUBLIC OF NICARAGUA

AGREED UPON BETWEEN
MINISTERIO DE AGRICULTURA Y GANADERIA
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

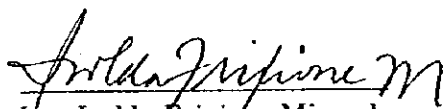
Managua, 26 August, 1997



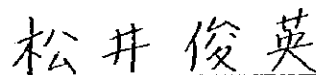
Ing. Juan F. Rodriguez
Secretario General
Ministerio de Agricultura y Ganadería



Mr. Takashi Fujita
Leader of Study Team
Japan International
Cooperation Agency (JICA)



Ing. Isolda Frixione Miranda
Directora General Gestión Bilateral
Ministerio Cooperación Externa



Mr. Toshihide Matsui
Leader of Advisory Mission
Japan International
Cooperation Agency (JICA)

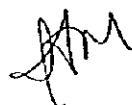
In accordance with the Scope of Work for the Study on Agricultural Development for the Region II and IV in the Pacific Coast in the Republic of Nicaragua (hereinafter referred to as "the Study") signed by the Government of the Republic of Nicaragua (hereinafter referred to as "the Government") and the Government of Japan on 20 March, 1997, the Government of Japan dispatched a JICA Study Team.

The JICA Study Team headed by Mr. Takashi Fujita submitted and explained the Inception Report on 20 August, 1997, under the attendance of the JICA Advisory Committee headed by Mr. Toshihide Matsui, to the Government headed by Mr. Juan F Rodriguez and to the Nicaraguan officials members involved to the present Study, at the same time exchange of opinions was made between the Nicaragua side and the Study Team.

As the result of the said explanation and an exchange of opinions, the Nicaragua side and the Study Team have agreed the following:

1. The Government received from the Study Team twenty (20) copies of the Inception Report in Spanish.
2. The Government has agreed with the contents of the Inception Report and study schedule.
3. The Study Team requested to the Government to assign one counterpart personnel for each Japanese expert.
4. The Study Team requested to the Government to provide suitable office space with necessary facilities in Managua as in Region II and IV
5. The Study Team requested to the Government to provide necessary vehicles and drivers.

This Minutes of Meeting is prepared in English and Spanish. In case that any discrepancy may arise between these two versions, the English version shall prevail.



List of Participants

1. Nicaraguan side

1) Ministerio de Agricultura y Ganadería(MAG)

Juan F. Rodriguez	Secretario General
Alvaro Montalvan	Director Cooperación Externa
Alvaro Icaza V.	Director Delegaciones Regionales
Erwing Gutierrez	Dirección Delegaciones Regionales
Francisco Montalvan	Delegado Regional II
Carlos Manuel Espinosa	Delegado Regional IV
Eduardo Marín Castillo	Asesor en Planificación de la Tierra
Dinorah S. Moreno	Asist. Técnico Administrativo OPESA
María Auxiliadora Espinoza	Consultor OPESA
Arkangel Abaunza	Consultor OPESA
Eduardo Hanón	Consultor OPESA
Carmen Largaespada	Consultor OPESA
Victor Tercero	Consultor OPESA
Augusto Oporta T.	Consultor IDC

2) Instituto Nicaragüense de Tecnología Agropecuaria(INTA)

Danilo Montalvan Duarte	Asistente Director General
-------------------------	----------------------------

3) Ministerio de Cooperación Externa(MCE)

Alejandro Maltez M.	Consultor Cooperación Japonesa
Minoru Arimoto	Asesor Especial

2. Japanese side

1) Japan International Cooperation Agency (JICA)

Toshihide Matsui	Leader of Advisory Mission
Kazumi Yoshihara	Study Administration

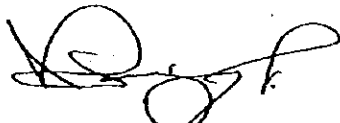
2) The JICA Study Team

Takashi Fujita	Team Leader
Takahisa Isozuka	Agricultural and Rural Infrastructure
Zetsugaku Kurita	Agronomy
Akira Nakamura	Hydrology / Meteorology
Tomofumi Masuoka	Translator
Hideki Hiroshige	Coordinator

MINUTES OF MEETING
ON
THE PROGRESS REPORT (1)
FOR
THE STUDY
ON
AGRICULTURAL DEVELOPMENT
FOR
THE REGION II AND IV
IN
THE PACIFIC COAST
IN
THE REPUBLIC OF NICARAGUA

AGREED UPON BETWEEN
MINISTERIO DE AGRICULTURA Y GANADERIA
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

Managua, December 9, 1997



Lic. Juan F. Rodríguez
Secretario General
Ministerio de Agricultura y Ganadería



Mr. Takashi Fujita
Leader of Study Team
Japan International
Cooperation Agency (JICA)

In accordance with the Scope of Work for the Study on Agricultural Development for the Region II and IV in the Pacific Coast in the Republic of Nicaragua (hereinafter referred to as "the Study") signed by the Government of the Republic of Nicaragua (hereinafter referred to as "the Government") and the Government of Japan on March 20, 1997, the Government of Japan dispatched a JICA Study Team.

At the end of the field survey of the Phase I Study, the Study Team headed by Mr. Takashi Fujita submitted the Progress Report (1) and explained its contents with an emphasis on the results of data collection, its analyses, present conditions of the Study Area, and the basic concept of the Master Plan, on December 1 1997, to the Government represented by Mr. Mario A. De Franco. On December 5, a second meeting was carried out in order to exchange opinions between the both sides and to receive the Nicaraguan's comments, being represented by Mr. Juan F. Rodriguez.

After presentation made by the Study Team, Nicaraguan and Japanese side exchanged opinions and agreed upon the following:

1. The Government received from the Study Team twenty (20) copies of the Progress Report (1) in Spanish.
2. The Government has agreed with the contents of the Progress Report (1) and basic concept of the Master Plan.

This Minutes of Meeting is prepared in English and Spanish. In case that any discrepancy may arise between these two versions, the English version shall prevail.



List of Participants

1. Nicaraguan side

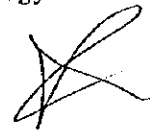
Ministerio de Agricultura y Ganadería (MAG)

Mario A. De Franco	Ministro
Juan F. Rodríguez	Secretario General
Alvaro Montalvan	Director Cooperación Externa
Alvaro Icaza	Director General Delegados Regionales
Luis Alberto Tercero	Director General de la DGIAP
Eduardo Marín Castillo	Asesor en Planificación de la Tierra
Arkangel Abaunza	Consultor OPSA
Eduardo Hanón	Consultor OPSA
Carmen Largaespada	Consultor OPSA
Roger Paguaga	Consultor OPSA
Orlando Siu	Consultor OPSA
Juan Velásquez	Consultor OPSA
Víctor Tercero	Consultor OPSA
Juan Sebastián Chamorro	Consultor OPSA

2. Japanese side

The JICA Study Team

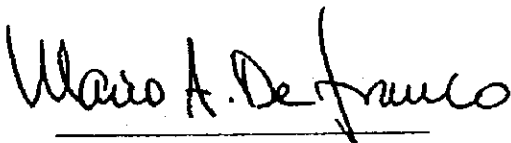
Takashi Fujita	Team Leader
Takahisa Isozuka	Agricultural and Rural Infrastructure
Zetsugaku Kurita	Agronomy
Yasushi Wada	Rural Society
Tatsuo Tashino	Agro-economy / Project Evaluation
Akira Nakamura	Hydrology / Meteorology
Tomofumi Masuoka	Interpreter
Hideki Hiroshige	Coordinator



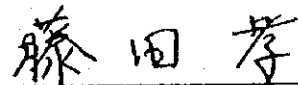
MINUTES OF MEETING
ON
THE INTERIM REPORT
FOR
THE STUDY
ON
AGRICULTURAL DEVELOPMENT
FOR
THE REGION II AND IV
IN
THE PACIFIC COAST
IN
THE REPUBLIC OF NICARAGUA

AGREED UPON BETWEEN
MINISTERIO DE AGRICULTURA Y GANADERIA
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

Managua, 17 April, 1997



Dr. Mario A. De Franco
Ministro
Ministerio de Agricultura y Ganadería

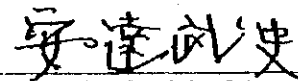


Mr. Takashi Fujita
Leader of Study Team
Japan International
Cooperation Agency (JICA)

Witness by



Ing. Adolfo Evertsz Vélez
Director General de Gestión
Ministerio Cooperación Externa



Mr. Takeshi Adachi
Leader of Advisory Mission
Japan International
Cooperation Agency (JICA)

In accordance with the Scope of Work for the Study on Agricultural Development for the Region II and IV in the Pacific Coast in the Republic of Nicaragua (hereinafter referred to as "the Study") signed by the Government of the Republic of Nicaragua (hereinafter referred to as "the Government") and the Government of Japan on 20 March, 1997, the Government of Japan dispatched a JICA Study Team.

The JICA Study Team headed by Mr. Takashi Fujita submitted and explained the Interim Report on 17 April, 1998, under the attendance of the JICA Advisory Committee headed by Mr. Takeshi Adachi, to the Government headed by Dr. Mario A. De Franco and to the Nicaraguan officials members involved with the present Study. At the same time, an exchange of opinions was made between the Nicaragua side and the Study Team.

As the result of the above mentioned explanation and an exchange of opinions, the Nicaragua side and the Study Team have agreed on the following points:

1. The Government received from the Study Team twenty (20) copies of the Interim Report in Spanish.
2. The Government requested the Final Report on the Master Plan to be presented as soon as possible. The Study Team promised to present the Report to the Government at the beginning of the Phase III (monitoring stage).
3. The Government mentioned that it will present to the Study Team the comments on the Interim Report during its stay in Nicaragua. The Study Team will analyze the comments and incorporate them, where relevant, into the Final Report of the Master Plan.
4. The Study Team explained the scope of the Feasibility Study and the methodology to be applied. The Government understood and accepted the explanation.
5. Discussions on the responsibilities for actions to be taken in the Pilot Study by the governments of Nicaragua and Japan and the beneficiaries took place. The Government and the Study Team agreed to further discuss the matter during the stay of the Study Team in Nicaragua. The final agreement on the matter will be made before the departure from Nicaragua of the Study Team.
6. The Study Team requested to the Government to assign one counterpart personnel for each Japanese expert and the counterpart for preparation of the Pilot Study.
7. The Study Team requested to the Government to provide suitable office space with necessary facilities in Managua as in Region II and IV.
8. The Study Team requested to the Government to provide necessary vehicles.

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List of Participants

1. Nicaraguan side

1) Ministerio de Agricultura y Ganadería (MAG)

Mario De Franco	Ministro
Horacio Jarquín	Vice-Ministro
Juan F. Rodriguez	Secretario General
Carlos Arce	Asesor Ministro
Alvaro Montalván	Director Cooperación Externa
Arkangel Abaunza	Consultor OPSA
Nestor Avedaño	Consultor OPSA
Roger Paguaga	Consultor OPSA
Eduardo Hanón	Consultor OPSA
Eduardo Marín Castillo	Asesor en Planificación de la Tierra
Juan Velásquez	Consultor OPSA
Jorge Luis Dubón	Consultor OPSA

2) Ministerio de Cooperación Externa (MCE)

Adolfo Evertsz Vélez	Director General de Gestión
Isolda Frixione M.	Directora Gestión Bilateral
Auxiliadora Vindel R.	Responsable del Dpto. Japón
Minoru Arimoto	Asesor Especial
Alejandro Maltez M.	Consultor Cooperación Japonesa

2. Japanese side

1) Japan International Cooperation Agency (JICA)

Takeshi Adachi	Leader of Advisory Mission
Kazuya Suzuki	Study Administration

2) The JICA Study Team

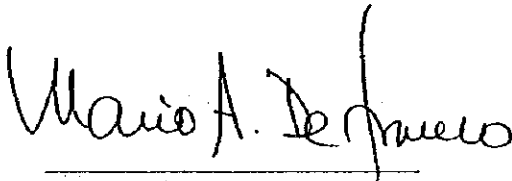
Takashi Fujita	Team Leader
Takahisa Isozuka	Agricultural and Rural Infrastructure
Zetsugaku Kurita	Agronomy
Yasushi Wada	Rural Society, Gender and Farmer's Organization
Akira Nakamura	Hydrology / Meteorology
Ruriko Tamate	Interpreter



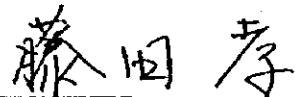
MINUTES OF MEETING
ON
THE PROGRESS REPORT (II)
FOR
THE STUDY
ON
AGRICULTURAL DEVELOPMENT
FOR
THE REGION II AND IV
IN
THE PACIFIC COAST
IN
THE REPUBLIC OF NICARAGUA

AGREED UPON BETWEEN
MINISTERIO DE AGRICULTURA Y GANADERIA
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

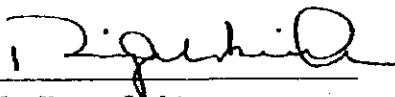
Managua, June 22nd, 1998



Dr. Mario A. De Franco
Minister
Ministry of Agriculture, Livestock,
and Forestry



Mr. Takashi Fujita
Leader of Study Team
Japan International
Cooperation Agency (JICA)



Mr. Roger Urbina
General Director
Nicaraguan Institute of
Agricultural Technology

In accordance with the Scope of Work for the Study on Agricultural Development for the Region II and IV in the Pacific Coast in the Republic of Nicaragua (hereinafter referred to as "the Study") signed by the Government of the Republic of Nicaragua (hereinafter referred to as "the Government") and the Government of Japan on 20 March, 1997, the Government of Japan dispatched a JICA Study Team.

The JICA Study Team headed by Mr. Takashi Fujita submitted and explained the Progress Report (II) on June 22th, 1998, to the Government headed by Dr. Mario A. De Franco and to the Nicaraguan officials members involved with the present Study. At the same time, an exchange of opinions was made between the Nicaragua side and the Study Team.

As the result of the above mentioned explanation and an exchange of opinions, the Nicaragua side and the Study Team have agreed on the following points:

1. The Government received from the Study Team twenty (20) copies of the Progress Report (II) in Spanish.
2. The Government presented the comments on the Master Plan which will be taken into consideration for the preparation of the Final Report on the Master Plan.
3. The Study Team explained the scope of the Progress Report (II) which dealt with the actual conditions of the Study Areas for the Feasibility Study and the methodology to be applied for the development of the Feasibility Study and the Pilot Study and its location. The Government understood and accepted the explanation.
4. The Study Team explained to the Government that the specific technical and financial details of the Feasibility Study and the Pilot Study will be studied in Japan. The results of the investigation will be explained in the Draft of the Final Report to be presented to the Government at the beginning of the Stage III of the Project.
5. Discussions on the responsibilities for actions to be taken in the Pilot Study by the governments of Nicaragua (MAG, INTA) and Japan took place. The Government and the Study Team agreed on the aspects concerning financial responsibilities to be taken jointly and separately by both sides.
6. The Government (MAG, INTA) accepted to assign adequate personnel for the implementation of the Pilot Study at the headquarters and regional levels.

This Minutes of Meeting is prepared in English and Spanish. In case that any discrepancy may arise between these two versions, the English version shall prevail.

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Ruey
(88)

List of Participants

1. Nicaraguan side

1) Ministerio de Agricultura y Ganadería (MAG)

Mario De Franco	Ministro
Juan F. Rodriguez	Secretario General
Arkangel Abaunza	Asesor
Eduardo Marin	Asesor
Alvaro Icaza	Director Delegaciones Regionales
Orlando Siu	Especialista en Proyectos
Antonio Reyes	Delegado Region II
Dionisio Soto	Asistente de la Dirección
Pedro Ruiz	Coordinador de Facilitadores (Region II)
Josefina Mendoza	Facilitadora (Región II)
Alcides Morales	Facilitador (Región II)

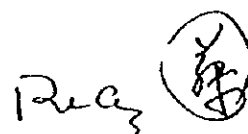
2) Nicaraguan Institute of Agricultural Technology (INTA)

Roger Urbina	Director General
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2. Japanese side

The JICA Study Team

Takashi Fujita	Team Leader
Takahisa Isozuka	Agricultural and Rural Infrastructure
Zetsugaku Kurita	Agronomy and Rural Extension
Yasushi Wada	Rural Society, Gender and Farmer's Organization
Joji Tokeshi	Agro-economy, Project Evaluation
Akira Nakamura	Hydrology / Meteorology
Daigo Yano	Design and Cost Estimation
Akeshi Mori	Agro-industry and Commercialization, Seeds Production Equipment
Hiroshi Ikeda	Seeds Production and Extension
Ruriko Tamate	Interpreter



ATTACHMENT-3
LIST OF MEMBERS

Members of the JICA Study Team and Nicaraguan Counterpart Personnel

Assignment	Study Team	Counterpart Personnel in Managua	Counterpart Personnel in León
Team Leader	Takashi Fujita	Lic. Juan F. Rodríguez R.	Francisco Montalván
Rural Infrastructure	Takahisa Isozuka	Eduardo Marín	
Agriculture and Extension	Zetsugaku Kurita	Arkángel Abaunza	Pedro Rubí Rolando Rivas (INTA)
Rural Sociology, Gender and Farmers' Organizations	Yasushi Wada	Carmen Largaespada	Juan Alcides Morales Ramona J. Mendoza
Agro-economy and Project Evaluation	Joji Tokeshi	Alvaro Icaza Orlando Siu	Ángel Navarrete (INTA)
Agro-industry and Commercialization	Akeshi Mori	Róger Paguaga	
Meteorology and Hydrology	Akira Nakamura	Eduardo Hanon	Ajax Fonseca (INTA)
Environment	Tsukasa Kishimoto	Victor Tercero Arnoldo Paniagua	
Structures Design and Cost Estimation	Daigo Yano	Eduardo Hanon	
Geology	Hideki Mori	Eduardo Hanon	Ajax Fonseca (INTA)
Seeds Production and Diffusion	Hiroshi Ikeda	César Boza	Freddy García (INTA)
Topography and Geodesics	Shinichi Kono	José Bravo (INTA)	Region IV)
Interpreter	Ruriko Tamate	Eduardo Hanon	

Note: Except where indicated, the counterparts belong to MAG

JICA